Global Income Inequality and the Poverty Threshold in the First Decade of the 21th Century – 2000 and 2005

Ines Langthaler

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Abstract

In this treatise, global income inequality is estimated by income- or expenditure based income distributions of world individuals in 2000 and 2005. To ascertain the dispersions for this first half of the 21st century's decade, Milanovic's methodology (2002a) is followed. For 1988, 1993, 1998 and 2002, he calculated world income distribution for world individuals based entirely on household surveys. Likewise here, incomes are adjusted for differences in Purchasing Power Parity. Measured by three different inequality indices (the Gini coefficient, the Theil index, and the Mean Logarithmic Deviation), global income inequality at the beginning of the millennium was found to have increased compared to the late 80s and 90s. Together with the results by Milanovic, a 17-years period was covered. Thereby, a continuous upward trend of inequality was identified. In 2000 and 2005, the difference between slow growth of densely populated rural areas of Asia compared to rapid growth of big and wealthy OECD nations still contributes most to overall inequality. Poverty rates declined intensely during the five year period. Especially the number of people living in extreme poverty (with less than $ PPP 1.25 a day) did bisect from 26 to 13 percent of world population between 2000 and 2005. However, this estimate of 26 percent measured for the year 2000 highly exceeds the prediction by Sala-i-Martin claiming this rate to be 7 % (Sala-i-Martin 2006: 392). Having reached a Gini coefficient of 71 in both years 2000 and 2005, the present investigation signifies together with the findings by Milanovic that the world is right in the thick of *"Divergence, Big Time"* (Pritchett 1997).

1.   The Objective

1.1   Why global income inequality matters

Various papers concerning income inequality, viewed from a macroeconomic perspective, were published over the last 15 years. This fact corroborates the increasing worldwide interest in this topic, especially by economists, and with a certain time lag also by sociologists.

Although the number of publications about worldwide inequality has risen, this interest is not new. Already in the 18th century, concerns about world inequality development came up. For instance, Thomas Malthus developed the theory of a "population trap" during that time. This theory was discussed until the mid 90s and predicted a worldwide pauperization as world population was seen to grow much faster than economy. Since Maddison (1995) pointed out that economical growth octuplicated while world population only quintupled since 1820 (Firebaugh 2003: 364), this idea has been dismissed.

Nevertheless, the phenomenon called globalization gave new fuel to the old fears of an imminent economical wealth decline. The importance of national borders is waning economically, politically, ecologically, technologically, and socially. Events taking part in one end of the world prevalently have worldwide influence.
According to Beck, modern societies do not only produce wealth but also risks that are not solvable by individual sovereign states alone. As global risks he defines, for instance, world poverty, terroristic attacks, or environmental pollution. Global risks cannot be traced back to a special location; they are not calculable or predictable. What is more, they cannot be compensated. The worst case has to be expected and must be prevented (Beck 2006: 9). World poverty is an important contributor which generates and boosts these global risks. For instance, it pushes the population explosion which then leads to the destruction of sustainable livelihood by soil degradation and overuse of land. In total, this increases environmental loads. Global

social inequalities, on the other hand, can cause (civil) wars, conflicts and big waves of migration which might threaten the in- and external peace.

Also Kenworthy pointed out that "Income inequality may contribute to higher crime rates, disproportionate political power wielded by the wealthy, lower levels of educational attainment, and perhaps even slower economic growth" (Kenworthy 2007: 1). Although his concerns are focusing the national level, they can obviously and unmodified be transferred to consequences of world inequality, causing the same effects on a global level.

Next to new global challenges, there was another, maybe unexpected observation that raised interest in examining world inequality: the autonomy of development of different inequalities. Rising within-country inequalities plus rising between-country inequalities do not compulsorily entail rising regional-, or global inequality (Sala-i-Martin 2006: 382). Sala-i-Martin (2006: 382) cautions against drawing a conclusion like that. Nevertheless, rising or declining within- and between-nation inequalities mistakenly led to deducing presumptions about the level of world inequality. Particularly, Sala-i-Martin refers to policy-makers having written the 2001 Human Development Report of the United Nations' Development Program (UNPD), arguing that global inequality has risen because inequalities within countries increased (Claim 1), and inequalities between countries increased (Claim 2) (Sala-i-Martin 2006: 382).

However, lots of papers appeared claiming increasing inequality within the rich nations of the world. Alderson, Beckfield, and Nielsen examined 16 OECD countries and showed that the rising inequality is generally a product of polarization and not one of only up- or downgrading of incomes (Alderson, Beckfield, Nielsen 2005: 416). The alleged increase of within-country inequalities of most OECD countries since the mid 80s (Hessel 2009: 4) were another reason that promoted concerns about, as well as interest in the development of global inequality.

From this, it becomes obvious that one cannot claim in- or decreasing global inequality deduced from rising within- or between national inequality. Nevertheless, the development of within-national inequalities on the one hand, and between-national inequality on the other do influence the level and development of global inequality. Therefore, the research and measurement on developments of these inequalities will also be considered in the following.

The development of sufficient control- and steering potential to measure global inequalities and world poverty in order to predict and influence future developments is vital for mankind. Influencing the level of inequality and poverty in the world is therefore in the interest of humanity.

A standardized BBC survey, comprising two thirds of citizens from 34 countries, exposed that in the perception of the citizens, the biggest problems nowadays are inequality and poverty. It is evident that the economic growth will not be to everybody's benefit. Two thirds of the people interviewed experience the intra-national redistribution in their countries as being very unfair. Beyond that, they fear a further increasing national social disparity (Hessel 2009: 4). Normally, countries try to attain a low level of inequality to suppress tendencies of autonomous groups in order to secure peace. Inequality can function as social tinder. Statesmen, like Gaddafi, Ben Ali, Mubarak, and Assad pursued corruption and cultivated a system of inequality. On the long run, this may lead to incidences like the "Arab Spring". Today, in a world of global players, of outsourcing, and increasing interchange of culture, even the poorest people are confronted with and long for the outlook and lifestyle of the rich OECD countries. The perception and recognition of poverty and inequality is still highly bound to national borders, though.

On a global level, the debate about globalization in the context of wealth brought Kuznets's thesis back to discussion: Kuznets presumed that during early industrialization, income inequality naturally will rise. This trend, however, will be reversed in more developed economies that evolve farther and farther away from

the primary (agricultural), and later from the secondary- (industrial) to the third sector, so that inequality starts declining again to remain at a low level (Kuznets 1955). As criticism against his theory, Harrison and Bluestone published "The Great U-turn" in 1988. Based upon the observed increase of income inequality in the United States, these authors assumed a reverse, meaning a re-increase of income inequality in the post-industrialization time. Moran holds the position that the curve of inequality cannot be viewed as a natural law and, therefore, does not follow a specific pattern (Moran 2005: 232). Herein he is reflecting Kruger (2002). Other scientists propagate endogenous explanatory factors for the development of rise or decline of inequality and the gaps between the rich and the poor in the different nations of the world.

One distinguished proponent of endogenous explanations for the level and development of income inequality, though focussing globalization's influence on inequality within individual countries is Timothy Smeeding. He suggests that globalization is just "one force among many" for rising inequality among the OECD countries examined (Smeeding 2002: 28). Smeeding claims that domestic policies, labour market institutions, and welfare policies are so powerful as to successfully countervail influences of globalization on inequality (Smeeding 2002: 28). Taking endogenous explanations as a basis, it logically follows that there is the opportunity to regulate the outcome or direction the curve of inequality will take. Though he focuses the influence of globalization on inequality from a nation-bounded perspective, he confirms the foregoing stated claim that the within- and between-country inequalities of the particular countries will likewise influence the level and development of global income inequality. Thereby, Smeeding is not denying globalization's influence at all.

However, the above stated fears of increasing inequality caused by globalization are not unfounded. Even if there are proponents underlining the influence of inequality by endogenous factors, globalization's effect on income inequality is no longer doubted, at all. It rather became the question of how strong its influence is. In an

elaborate multiple regression model Alderson and Nielsen showed very convincingly that the influence of globalization (measured as North-South-Trade, outflow of direct investments, as well as net migration rates), increases national within-country inequality to an extent that cannot be denied or offset by domestic policies and redistribution. In a comparative appraisal of the works by Smeeding and Aldersen/Nielson, Langthaler (2011) demonstrated that Smeeding only described the change of patterns inequality followed during the examined years, but failed to explain their causality. Beyond that, she showed that Smeeding drew conclusions from self constructed assumptions. In contrast, Aldersen and Nielsen gave a plausible and well-argued explanation for the effect that globalization has on income inequality (Langthaler 2011: 23).

Finally, another reason reveals why measurement of global income inequality matters. This reason was being pointed out by Milanovic (2002a: 53) who argued that knowing about global inequality allows evaluation of, and estimation about monetary development aids for poor countries' progress and proceedings.

From this, it can be summarized that there are many good reasons why global inequality and world poverty are issues of concern. Analysing and influencing future developments of these global risks are vital for mankind in order to secure livelihood and peace. Although inequality developments concerning within- and between-country inequalities interplay with global inequality developments with different strengths, it was also said that interest in these problems is still very country-focused. The sociological perspective has always been nation-bounded. Questions and analysing instruments underlie a methodological nationalism which, according to Beck, can be characterized by three features: national fragmentation, limited universal civic norms of equality, and institutionalized incomparability (Beck 2006: 7). National fragmentation describes the fragmentation and transformation of global- into intra-national inequalities. They are not perceived as global ones. Moreover, limited universal civic norms of equality also lead to this imperceptibility and, above that, to a non-recognition and following to a non-acceptance of global

inequalities. Thirdly, the introverted perspective of the methodological nationalism makes inter-country comparisons of inequalities politically effectless (Beck 2006: 7). Consequently, the methodological nationalism avoids that there emerges a basis from which these global risks can be recognized, analyzed and tackled. Therefore, Beck calls for a shift of the sociological perspective towards a cosmopolitan one (Beck 2006). Such a view would provide the background for a "global social question" to emerge. Next to the publications by Milanovic, the present treatise shall help to further counteract the lack of a cosmo-political viewed works on measuring inequality on a global level.

Kreckel, however, came to the conclusion that the circumstances that paved the way for the upcoming of the social question during the industrialization era are not given today. According to him, a second "Great Transformation" following Polanyi (1978) is under the given circumstance of a missing world middle class, as calculated by Milanovic[1], impossible. The middle class, however, was the mediating power between opposed interests of the poor and the rich that brought the social question into existence during industrialization time (Kreckel 2006: 23).

On the other hand, Kreckel saw initial first signs that a global social question might gradually come up in the future (Kreckel 2006). He discovered tendencies by various NGOs and the "*Post*"-Washington (or New York) Consensus to establish basic norms for reducing global poverty. By that, he found a widening interest in the welfare of people from other countries and regions (Kreckel 2006: 12). International organizations like the United Nations (UN), the United Nations Conference on Trade and Development (UNCTAD), the United Nations Development Programme (UNPD), as well as the World Bank draw the world poverty problem to public attention. Kreckel mentions for example the passing of the Millenium Goals in 2000 which aim to have reduced poverty by 2015 (Kreckel 2006: 9). The term *"Post"*-Washington

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[1] Milanovic estimated the size of the world middle class in 1998 with an ascribed income between $ PPP 3,987 and $ PPP 6,060 per year and per capita and found the size of the middle class to be 6.7 % of world population. In contrast, only 16 % of world population live with more than that (Milanovic 2005: 41). Kreckel recognizes that Milanovic's estimations about the size of a world middle class (Milanovic 2005) is not free from methodological problems that lacks a theoretical foundation about the question which income borders are defining a middle class (Kreckel 2006:23). Nonetheless, he underlines the validity when viewed from a trend perspective saying that, in fact, there is an "emptiness in the middle" (Milanovic 2005: 41), and the heavy masses of world income is concentrated onto two poles (Kreckel 2006: 24).

Consensus (in contrary to the before practised Washington Consensus of liberalism and free-trade) refers to a period that shifts away from just focusing the rich world towards fighting worldwide poverty and promotes fair trade and equity.

More and more, the phenomenon which he termed "Rezeptionssperre" (Ger.) wanes. By this expression he means that the intentional blindness of rich countries' citizens and organizations for the needs of the poorer countries fades (Kreckel 2006: 7). This period of *"Post"*-Washington Consensus was being introduced by Nobel Prize winner Joseph Stiglitz during his short time as chief economist at the World Bank (1997-2000) (Kreckel 2006: 12). Inducing this wind of change made people name him "the rebel within" the World Bank (Chang 2002). Still within the context of an ongoing *"Post"*-Washington Consensus period, Kreckel pointed to the shift of emphasis of the World Bank in 2005 under chief economist Francois Bourguignon (2003-2007) as indicated by breaking up structural consolidated inequalities of opportunities. These structural inequalities called "inequality traps" were first determined in the World Development Report 2006 under the title "Equity and Development" (Kreckel 2006: 12).

Today's poverty is not any more a question of missing food capacities or exploitation, but rather of exclusion[2] and structural disadvantages. Therefore, the only way to solve the problems of poverty and inequality in the world, and to avoid the negative consequences they bear, is by a global social solution.

1.2   Is equality economically feasible?

Apart from the question *why* global income inequality raised interest during the last 20 years, the economic sense of reaching a low level of inequality has been challenged. This question has been widely debated from a national focus. Kenworthy, for example, illustrated and discussed this idea in "Egalitarian Capitalism in the Late Twentieth Century". Therein he claimed that Egalitarians

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[2] For a first approach from a cosmopolitan view on global exclusion see Anja Weiß who suggests to imply a system-theoretical view of in-and exclusion possibilities to special subsystems as causes of inequality can allegedly be reflected better from this view than by inequality studies (see Weiß: Raumrelationen als zentraler Aspekt weltweiter Ungleichheiten, p.4).

pursue three goals: "low inequality, high living standards, and high employment" (Kenworthy 2007: 4). Some scientists argue that income inequality may be bad for growth, like Birdsall/Ross/Sabot 1995, Bowles/Gintis 1995, Kenworthy 1995 (Chapter 3), Perotti 1996. The opponents state that inequality is beneficial for growth (like Okun 1975). Secondly, there are voices claiming that equality is compatible with job creation while the other side is convinced of the contrary (for example Blau/Kahn 2002; Blanchard/Wolfers 2000). Assuming that equality would discourage growth and/or job creation may lead to stagnating or declining incomes and therefore to decreasing living standards. Following Kenworthy, in his view, this "(…) is the most important concern about potential incompatibilities between equality and other aims" (Kenworthy 2007: 9). All these three trade-off effects (equality-growth, equality-jobs, equality-incomes) doubt about the compatibility of the three goals favoured by Egalitarians (Kenworthy 2007: 7-9). After proving these argumentations empirically, Kenworthy summarized that one can be optimistic about the compatibility: low inequality, high living standards and high employment rates do not compulsorily exclude each other (Kenworthy 2007: 43). In conclusion, no restrictions can be found that make a transfer from the national to the global perspective inconceivable.

1.3   The theoretical framework

The discussion about global inequality can roughly be divided into two theoretical frames: The deputies of the *Divergence Theory*[3] hold the view that incomes of poor countries increase less than incomes of rich ones (β-divergence), and that this dispersion is growing over time (σ-divergence)[4]. In contrary to that, there is the discussion that can be titled as the *Convergence-Theory*, saying that global income inequality is declining over time as incomes in the world are converging, so that poor countries are catching up with rich ones. Major representatives are Firebaugh (2003) Firebaugh and Goesling (2004), Bhalla (2002), Schultz (1998), and Sala-i-

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[3] Scientists following this Divergence Theory are Baumoll (1986), De Long (1988), Barro/Sala-i-Martin (1992), Mankiw/Romer/Weil (1992), Sala-i-Martin (1996), and Pritchett (1997).
[4] The expressions σ- and β-divergence were established by Sala-i-Martin and Barro (1992).

Martin (2006), though he was earlier in time a proponent of the Divergence Theory (Sala-i-Martin 1992, 1996).

There is unity as scientists agree in one point which Firebaugh summarizes as follows: The average individual of today is richer compared to the average individual of the past (Firebaugh 2003: 369). But, this increase in mean incomes of individuals does not give evidence about the level of inequality.

Bourguignon and Morrison treated the question of world inequality development in a historical manner and examined the time period from 1820 to 1992. Although focusing on "international" rather than on "world" inequality (Bourguignon/Morrison 2002: 727), they still come to the contrary conclusion of Sala-i-Martin by saying that: "(…) income inequality worsened dramatically over the past two centuries. The Gini coefficient increased by 30 percent and the Theil index (by) 60 percent between 1820 and 1992" (Bourguignon/Morrison 2002: 742). However, the opponents agree that world inequality is to a higher extent determined by between-country differences rather than by within-country differences. If one is poor or not is still highly bound to where one lives. This appraisal is summarized by Milanovic as follows: "(…) from a global perspective (…) more than 80 percent of variability in income globally is due to circumstances given at birth" (Milanovic 2010: 145).

Deepening the debate about how to define and measure income inequality, Milanovic classified income inequality from a macroeconomic perspective in three different concepts:

- *Concept 1* inequality
- *Concept 2* international inequality
- *Concept 3* global inequality

Concept 1 inequality is simply an inter-country inequality based on a comparison between mean incomes (Milanovic 2006: 2). In contrary to the first approach, *Concept 2* or "international" inequality is defined through the inequality among countries' mean incomes, but takes into account the countries' different (population) sizes by population weights (Milanovic 2006: 2). *Concept 3*, or global

inequality, is by definition the inequality among individual citizens in the world "(…) composed of population-weighted international inequality, and inequality due to income differences within countries" (Milanovic 2006: 3).

For instance, in the *Concept 1* approach, the People's Republic of China (PRC) will get as much weight as, for example, Germany. This is an important point of objection because it should be taken into account that income changes in small countries with less population will not have the same effect on global inequality than income changes in big countries with much more population.

The second approach (*Concept 2*) was being applied by most of the previous studies: by Theil/Seale (1994), Podder (1993) or Bourguignon/Morrison (2002). Others, like Schultz (1998), take into consideration that countries cannot be represented by the countries´ mean income only and use within-country distributions deduced by the Gini coefficient (Milanovic 2002a: 53). This kind of studies lack an important methodological necessity: They estimate entire country distributions by the countries' Gini coefficients. Milanovic criticizes these approaches. He states that it is not acceptable to derive the country distributions from only one statistic (Milanovic 2002a: 53). Furthermore he doubts that the gross domestic product (GDP) is a suitable indicator of individuals' mean incomes (Milanovic 2002a: 53).

According to Milanovic, within-country distributions are solely available from household surveys. In his view, this distinction in data requirement is the most important difference between *Concept 2* and *Concept 3* inequality (Milanovic 2006: 4). Moreover, he criticizes that Sala-i-Martin's approach[5], by taking the GDP per capita as the mean income instead mean incomes from household surveys, still stays in the second Concept while claiming to measure "global" inequality (Milanovic 2006: 6). He even declares his method a little ironically as "(…) quite ingenious given their rather minimal information requirements" (Milanovic 2006: 6).

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[5] The approaches of Sala-i-Martin and Milanovic will be explained and compared in detail in the next section.

In order to shed light on the question whether inequality at the beginning of the last decade did increase further and how, as compared to earlier measurements by Milanovic, the present investigation attempts to measure global income inequality focussing at world individuals through a Concept 3 approach.

Section 2 will review and compare the four essential publications about world income inequality by Milanovic (2002 a/b and 2009) and by Sala-i-Martin (2006). This comparison is made with the objective of deriving the most appropriate approach for measuring global inequality for 2000 and 2005 in this treatise. In Section 3, this approach will be exposed and data coverage will be described. Possible explanations for the different results by Sala-i-Martin and Milanovic that had already been dismissed by other authors will be re-investigated in Section 4. Section 5 and 6 will present and interpret the findings from the own data analysis, whereas Section 5 will deal with regional; Section 6 with world income inequality. The explicit focus on regional inequality will be consulted to explain world income inequality in the next step. Section 7 will view these findings in connection to the other authors' results and puts them in a timeline. The treatise will be summarized and concluded by Section 8.

2. Comparison of the two approaches in measuring global income inequality: Milanovic vs. Sala-i-Martin

The papers of Milanovic (2002 a/b) and Sala-i-Martin (2006) resume presenting two contrary conclusions. While Sala-i-Martin claims that global income inequality declined steadily at least during the last two decades of the 20th century (Sala-i-Martin 2006: 392), Milanovic is convinced that global income inequality increased by 3,2 Gini[6] points between 1988 and 1993 (Milanovic 2002a: 72). As there has to be a methodological reason for the differing results, in the following section, the two approaches will be compared.

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[6] The Gini coefficient or Gini index is a statistical concentration measure that illustrates inequality. It is the coefficient between the equality line and the Lorenz curve, whereby it can range between 0 (total equality) and 1 (total inequality). Therefore, changes in the middle of the distribution will influence the coefficient more than changes at the ends of the distribution.

2.1 Major methodological points and data coverage

In total, Sala-i-Martin (2006) took into consideration 138 countries between 1970 and 2000. As measure of income he used the Purchasing Power Parity (PPP)-adjusted GDP per capita from the Penn World Tables 6.1[7] (Heston/Summers/Aten 2002). The GDP per capita is taken as the mean country income. Within-country distributions up to 1996 are taken from microeconomic income survey data provided by Deininger and Squire (1996), later ones from UNU-WIDER[8] which is the continuation of the first named dataset. By combining these macro- and microeconomic data, quintile shares for each country were estimated (Sala-i-Martin 2006: 357). In this context, Sala-i-Martin mentioned that, with exception of the United States, there weren't surveys for every country and every year available. Therefore, missing data were approximated by "neighbouring regions" (Sala-i-Martin 2006:359). Based on data availability, he presents a division of his sample countries into four groups: Group A includes "countries for which GDP per capita is available and income surveys are reported for various years; Group B- countries for which GDP per capita is available and only one survey is reported between 1970 and 2000; Group C- countries for which GDP per capita is available and microeconomic surveys are not reported; Group D- countries for which no GDP per capita is available" and no surveys were accessible (Sala-i-Martin 2006:358). Although his Group A accounts, according to him, for 84 percent of the world population in 2000, this representation of world population for all examined years should be considered with caution.

Firstly, Sala-i-Martin covers 30 single years in total. He claims to cover 84 percent of world population, but this solely counts for the year 2000 (Sala-i-Martin 2006: 358).

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[7] "The Penn World Table provides Purchasing Power Parity and national income accounts converted to international prices for 189 countries for some or all of the years 1950-2007" Self- Description by the Penn World Table's webpage. Available at: http://datacentre2.chass.utoronto.ca/pwt/.

[8] "(UNU-WIDER) United Nations University World Institute for Development Economics Research was established in 1985. The institute undertakes multidisciplinary research and policy analysis on structural changes affecting the living conditions of the world's poorest people; provides a forum for professional interaction and the advocacy of policies leading to robust, equitable, and environmentally sustainable growth; and promotes capacity strengthening and training for scholars and government officials in the fields of economic and social policy-making." Self- Description by the UNU-WIDER's webpage. Available at: http://www.wider.unu.edu/home/en_GB/index/.

Following this, it is not apparent how much of the world population is being covered by the rest of the data for the years within the time period. Secondly, the rather vague definition of Group A, containing surveys for "various years" does just state that Sala-i-Martin requires "more than one", indicating a minimum of two surveys per country in this time period. Group B and C only make up 5 and 4 percent of the world population in 2000. Group D is excluded from the analysis. For the remaining countries (except the ones of Group D), in each of the examined years, all the missing data are approximated by regressions. He justifies this procedure by the assumption that excluding them would "tend to bias the results towards finding an excessive reduction in income inequality" (Sala-i-Martin 2006: 359). Regarding that especially poor countries did not conduct household surveys regularly, if they did at all, this justification sounds logically. Since the author doesn't state clearly which of his results are based on data and which on estimations, it can be insinuated that in the worst case, the majority is based on estimates, rather than on data.

The analysis of the second author, Milanovic (2002a/b), is solely founded on household survey data from 91 countries. Incomes are adjusted for differences in PPP whereas income inequality is measured by the Gini coefficient and the Theil index for 1988 and 1993 (Milanovic 2002a). As to get a precise description of distributions, it is his objective to have at least ten data points per country per year, whereas each data point (decile) is weighted by the represented population. For 12 surveys there were only quintile distributions. In total he used data from 216 country surveys for both years (Milanovic 2002a: 56). Out of that, one can presume that within the regarded 91 countries in total, there is at least one survey per year per country, respectively. Since he only analyses two years, not a timeline of 30 years like Sala-i-Martin, he cannot point out a development of inequality over time, but, on the contrary, he is not forced to estimate large missing data parts.

Milanovic divides the included countries into five geographical regions: Africa, Asia, Eastern Europe and the former Soviet Union (FSU), Latin America and the Caribbean (LAC), as well as Western Europe, North America and Oceania (WENEAO) (Milanovic 2002a: 59). The full sample covers 86 % of world population for 1988, 91 % for

1993, and 84 % for the common sample[9] wherein countries are included in both years (Milanovic 2002a: 59). With respect to the availability of data, the coverage of Africa in his analysis should be emphasized: while for 1988 only 14 African countries were included, for 1993 the number increased to 29. Another notable paradigm is the treatment of China (PRC)[10] and India. Together, both countries make up about 40 % of world population. To strengthen the validity of his analysis, Milanovic divided these countries into rural- and urban parts. By that he could take the high differences in mean incomes between town and country areas into consideration. This division was also undertaken for Bangladesh, Indonesia and Pakistan (Pakistan only in 1988) (Milanovic 2002a: 60).

In contrast, Sala-i-Martin covered only 5 African countries in his Group A for which GDP and "more than one" household survey over the thirty years period was available; 17 in Group B for which one survey was available and 12 African countries in Group C for which no survey was available between 1970 and 2000 (Sala-i-Martin 2006: 393). Reconsidering a period of 30 years with this poor amount of available surveys forces him to estimate large parts of his data from which he later deduces his conclusions. Contrary to Milanovic, Sala-i-Martin did not take account of price level differences in urban- and rural densely populated Asian areas: Whole Eastern Europe and the former Soviet Union were not included in the sample by Sala-i-Martin (Sala-i-Martin 2006: 393). Methodologically, both authors explain results of world income inequality by changes in regional income inequality developments and therefore present regional income inequality as an interim stage

2.2   The main differences

Sala-i-Martin follows the established principle of national studies about income inequality, i. e. not to combine surveys that ask for different concepts of income. He solely uses income-based surveys for his analysis. Milanovic, on the other hand, states that intermingling surveys using two different concepts of income is not

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[9] The dataset that holds data for countries in both years is named "common sample" by Milanovic. The "full sample", in contrary, includes countries for which distributional information and mean incomes for either 1988 or 1993 exist.
[10] Subsequently, the PRC is meant when talking about "China".

avoidable as otherwise either income- (mostly undertaken in richer countries) or expenditure-/consumption- (mostly undertaken in poorer countries) based surveys would be excluded. This would expulse a large part of available survey data: "(…) the number of countries which would have been included in each year would have been substantially lower than when both income and expenditure are combined" (Milanovic 2002a: 61). In his view, a viable approach would have to estimate two different distributions: one based on income the other on expenditure. But he also states these would be two "*unrelated* distributions, none of which would represent the world" (Milanovic 2002a: 61). They would represent the world population very poorly. Milanovic denotes that mingling income and consumption-/expenditure-based information from surveys will bias the Gini downward (Milanovic 2002a: 61).

To construct the mean income of each country, Milanovic uses mean incomes from surveys while Sala-i-Martin extracts GDP per capita income. This methodological difference divides a *Concept 2*- from a *Concept 3*-analysis. Sala-i-Martin justifies his line of action by stating that features of income surveys may vary to a large extent from country to country. Particularly , he mentions the methods of data collection, definitions of family units, response rates and the like, and summarizes: "(…) the properties of survey means are not well understood" (Sala-i-Martin 2006: 356).The main advantage and reason for Sala-i-Martin using the GDP national account data is to be seen in the better availability compared to household data "(…) this is perhaps the most important reason: survey data are not available for every year and for every country" (Sala-i-Martin 2006: 356).

Milanovic also does not deny the advantage of national account data when saying that they are relatively uncontroversial: "We know what is meant by GDP per capita and we know that these values do give some generally accepted mean incomes of all nations" (Milanovic 2006: 8). His opinion that the GDP per capita is not appropriate for an analysis measuring global income inequality is supported by cogent arguments: Firstly, the GDP includes "components such as corporate investment from retained profits, build-up of stocks, government spending on

defence etc" (Milanovic 2006: 8). Secondly, public spending on health and education in value and amount cannot be lead back to the individual consumers (Milanovic 2006: 8). Even if some consumers benefit from this kind of state spending, it is presumably only the top end of global distribution that can take advantages hereof, while the lower end does not receive anything of it (Milanovic 2006: 9-10). The most important objection against using the gross domestic product is the bias resulting from mingling national account data with survey distributions. In his view, "(...) such an adjustment is not distribution-neutral" (Milanovic 2006: 9) and he explains why: "Commonly knowing that surveys tend to under-represent the incomes and capital or property of the rich people, a different up-scaled mean like the GDP, when applied to distributions from surveys, will increase incomes of the poor in the same manner as it will increase for the rich ones" (Milanovic 2006: 9).

As already mentioned above (objective 1.3, p.9), according to Milanovic, income inequality analyses can be classified by three Concepts. Following his classification, Sala-i-Martin still got stuck in a *Concept 2*-analysis meaning the measurement of international income inequality or, in other words, of giving a population-weighted inter-country comparison. In fact, Sala-i-Martin takes within-country distributions from survey data into account, but compounding national account data with microeconomic ones does bias the results to an extent that cannot be assessed properly (Milanovic 2006: 9).

In contrast to Milanovic, Sala-i-Martin estimates world poverty by applying various poverty lines. As in the poverty threshold discussion there is always the problem of the "baseline year", meaning that there is disunity about from which year and therefore from which basic value the threshold should be calculated, Sala-i-Martin sets down more than one specific poverty line. The World Bank redefined the one dollar a day threshold several times, but did thereby not follow a certain price level logic. The reasons are difficult to retrace. Sala-i-Martin, too, did not find any logical reasons behind this redefinition and illustrates its arbitrariness by the following statement: "(...) clear is that 1.02 dollars-a-day in 1985 prices do not correspond to 1.08 dollars in 1993 prices" (Sala-i-Martin 2006: 370). However, Sala-i-Martin takes

1993 as a baseline year, but keeps the $ 495 line keeps for the "one-dollar-a-day" definition. As there is no agreement about the question below which income level people are poor, he establishes various other poverty lines so that readers can choose their favourite one (Sala-i-Martin 2006: 372). As already brought forward by Milanovic, it has been found that rich people underestimate their incomes (Milanovic 2006: 9). This would bias the poverty estimates downward. Therefore, Sala-i-Martin follows Bhalla (2002) who was suggesting to correct this bias adjusting the one-dollar-a-day line by roughly 15% (Sala-i-Martin 2006: 373). Increasing $ 495 by 15 % would give an income of $ 570 per year which almost corresponds to the "1.5-dollars-a-day" line[11] in 1993 prices (Sala-i-Martin 2006: 373). Therefore, the $ 1.5 per day is taken as to account for $ 570 instead of $ 547.5 per capita and year. Additionally, he reports a poverty line of about $ 730 a year (which corresponds to the "two-dollars-a-day" line in 1993 PPP prices) and a "3-dollar-a-day" line being $1140 per year (in 1993 prices) (Sala-i-Martin 2006: 373).

For estimating world income inequality, Sala-i-Martin applies eight inequality measures: the Gini coefficient, one Atkinson[12] index with coefficient 0.5, another Atkinson index with coefficient 1, the Variance of Log income[13], the ratio of the income of the top 20 centile to the bottom centile, the ratio of the income of the top 10 decile to the bottom 10 decile[14], the Mean Logarithmic Deviation[15] (MLD)

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[11] This information only serves to explain what makes Sala-i-Martin to establish the $ 1.5-line. Nevertheless, it is untraceable why lifting up the line would correct a bias caused by underreported incomes of the rich as percentages under the specific poverty line remain the same.

[12] The Atkinson indices are inequality measures that are useful in determining which end of the distribution adds most to overall inequality (DeNavas-Walt/Proctor/Smith 2010: 10). The index can be transformed into a normative measure by applying a coefficient that gives different weight to incomes and therefore evaluates the difference between high and low incomes differently. If there is a low inequality aversion (coefficient = 0) the index is sensitive to changes in the upper tail of income distribution and, the other way around, if inequality aversion is high (coefficient = 1), the index is sensitive to happenings at the lower end of the distribution. Sala-i-Martin chose coefficients of 0.5 and 1, so none of them were sensitive to the lower distributional changes.

[13] It is common to transform data of incomes of some currency units into the logarithmic income by the logarithmic function. The variance is used in order to see how far the incomes of the distributions are spread.

[14] The ratio of the income of the top 10 decile to the bottom 10 decile is the P90/P10 ratio. It informs about how many times higher the income of the poorest person of the richest 10 % of the distribution is compared to the richest person of the poorest 10 %.

[15] The Mean Logarithmic Deviation (MLD) is like the Theil index a measure of inequality. In contrast to the Gini coefficient, these two indices belong to the family of Entropy indices. The concept "Entropy" is a measure of disorder; in measuring income inequality meaning the deviation from perfect equality (Bellú/Liberati 2006: 2). The Generalized Entropy Indices are additively decomposable into two components that inform about how much inequality results from within-inequality on the one hand, and how much from between- inequality, on the other. Whereas the Theil index is more sensitive to changes that happen in the upper tail of the distribution,

and finally, the Theil index[16] of inequality (Sala-i-Martin 2006: 384). In order to show *how* global income inequality is constituted, he decomposes the Theil index and the MLD – the two Generalized Entropy Indices[17]. Concerning this matter, he alludes to the concept used by the United Nations Development Programme (UNPD) (2001), whose Gini decomposition did allegedly not give satisfying results (Sala-i-Martin 2006: 383). He justifies the decomposition of the Generalized Entropy Indices in a footnote by referring to Bourguignon (1979) and Shorrocks (1980). Sala-i-Martin explicitly stresses that the Gini coefficient is not additively decomposable and cites Shorrocks (1980) as a reference. In this context he concludes that it is no satisfying means to show how income inequality in- or decreased by the within-country and between-country inequality. The aforementioned author (Shorrocks) emphasized that the Gini coefficient is not additively decomposable, but he never mentioned that it is not decomposable at all. Further more, he does not state that it is inappropriate to decompose income inequality by the Gini coefficient. Instead, Shorrocks simply points to the fact that "(…) the Gini coefficient is decomposable while extending it in the sense of equation" and concludes: "So the class of inequality measures that are decomposable under all non-overlapping partitions of the income distributions certainly contains indices that are not covered by, say, equation" (Shorrocks 1984: 1384). He goes further by claiming: "(…) any decomposable inequality I (is convertible) into an additively decomposable inequality index J. More specifically, J can be made to satisfy the equation (…)" (Shorrocks 1984: 1373). This claim has been tested in that paper and counts to be proved (Shorrocks 1984: 1373). Consequently, the Gini decomposition is not additively decomposable into within- and between-parts, but is fulfilling the criterion of additivity if the coefficient is extended by equation, the so called overlapping-part which imposes constraints on the permissible partitions of the populations.

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the MLD is sensitive to changes at the bottom end (OECD 1997: 31; Bellú/Liberati 2006: 2). The MLD is computed from the Theil index and is therefore also called the "second Theil index".

[16] The Theil index is one of the Generalized Entropy Measures (see footnote 13 on MLD). Unlike the MLD, the first Theil index is more sensitive to changes in the upper end of distributions (Bellú/ Liberati 2006:2).

[17] The additively decomposable indices. (For Generalized Entropy Indices see footnote on MLD).

Milanovic used the Gini coefficient in his approach for the regional income inequality and, additionally, the Theil index for measuring world income inequality. Any other inequality measures, he did not apply. Per contra to the first analysis by Sala-i-Martin, Milanovic took the plunge to decompose the Gini coefficient. Contrary to Sala-i-Martin, he refers to a later Shorrocks (1983, 1984) in order to show which scientists also used the Pyatt-type decomposition: "The same decomposition formula is derived also by Mookherjee and Shorrocks (1982) and (the above cited) Shorrocks (1984)" (Milanovic 2002a: 69). The coefficient is splitted into three components: (a) within-country inequality, (b) between-country inequality, and the extention (c) an overlapping-component measuring equation (Milanovic 2002a: 69). Both, Sala-i-Martin and Milanovic define the within-country component as that part of inequality (Sala-i-Martin 2006: 388), "(…) which is due to the differences in income between the recipients in individual countries", and the between-country component as being that inequality "(…) due to people living in countries with different mean incomes" (Milanovic 2002a: 69).

Interesting is Milanovic's view on the overlapping-component which gives "additional information" compared to the Generalized Entropy Indices, Theil and MLD. He refers first to "a possible" interpretation by Yitzhaki and Lerman (1991; Yitzhaki (1994), and Lambert and Aronson (1993), that the overlapping-component is the "homogeneity of population" (Milanovic 2002a: 70). Finally, he defines: "The more important the overlapping-component compared to the other two, the more homogeneous the population – or differently put, the less one's income depends on where she lives" (Milanovic 2002a: 70). At first, the question remains open on how to interpret an overlapping-component that transcends the other two components to such an extent that the within- and between-country inequality loose in expressiveness. Explaining how to interpret the overlapping-component in more detail, he states: "If mean incomes (of the countries) are very close, then the only way for the overlap-component to be small, and for the within-country component to be relatively large, is if countries' own income density functions are very narrow with Ginis close to 0. But since individual country Ginis are, of course, not zero, poor people from a slightly richer country will overlap with the rich people from a slightly

poorer country. (…) Thus any inequality above 0 will 'feed' the overlap-component and detract from 'within' component. Or, in other words, the overlap-component will be small only if (i) mean incomes are very far (different) from each other, or (ii) individual country distributions are very equal" (Milanovic 2002a: 83). From this perspective, the overlapping-component appears more logical than it did before.

The Pyatt-type decomposition formula he uses is:

$$Gini = \sum_{i=1}^{n} G_i \, p_i \, \pi_i + \frac{1}{\mu} \sum_{i} \sum_{j>i} (y_j - y_i) \, p_i \, p_j + L$$

whereby y_i is the mean income of country i. G_i is the Gini Coefficient of country i; π_i is the income share of country i in total income of the region/world. Countries are ranked by their mean incomes in descending order: ($y_i > y_j$). p_i is the population share; μ the mean income of the region/world; L summarizes the part in which incomes overlap.

Milanovic revised his 1988 and 1993 Gini indices published in a 2009 working paper rising them by 4.4 and 6.1 Gini points, respectively (Milanovic 2009: 13). Two additional years (1998 and 2002) were calculated for inequality. Thereby, he shows that the Theil index increased even more than the Gini coefficient (Milanovic 2009:11). His recalculation was based on "The world in $ PPP 2005", a joint project of the UN-OECD-World Bank development programme. This project undertook a new direct price level comparison across 148 countries (95 % of world population). The ICP[18] results of about 1000 goods and services led to the conclusion of extremely dissonant estimates of price levels compared to PPP data of 1993, and therefore contributed to a dramatic underestimation of world inequality and world poverty (Milanovic 2009:12). The following table (Table 1) shows his recalculation of inequality measures:

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[18] "ICP" is the abbreviation for "International Comparison Program", a project that compares goods and services based on purchasing power parity.

Table 1: Global income inequality based on "new" 2005- PPP's respectively "old" 1993- PPP's

(founded on household survey data from WYD dataset)

	1988	1993	1998	2002
Gini (new data)	68.4	69.9	69.4	70.8
	(1.7)	(1.8)	(1.8)	(1.3)
Gini (old data)	62.3	65.5	64.4	65.7
	(2.0)	(1.7)	(1.9)	(1.3)
Change (in Gini points)	+6.1	+4.4	+5.0	+5.1
Theil (new data)	87.5	93.7	94.2	100.1
	(6.3)	(7.1)	(7.3)	(5.7)
Theil (old data)	71.5	81.2	79.1	83.4
	(5.9)	(5.6)	(6.7)	(5.4)
Change (in Theil points)	+12.0	+12.6	+15.1	+16.7

Source: Milanovic (2009): Global Inequality Recalculated: The Effect of New 2005 PPP Estimates on Global Inequality, p. 13. Policy Research Working Paper 5061, The World Bank Development Research Group-Poverty and Inequality Team, September 2009.

For comparison, the Gini coefficients and Theil indices published by Sala-i-Martin for the same years will also be presented here. From the 30 years he covered, only the four years also applied by Milanovic were selected. Indices base on mean incomes from GDP per capita data, incorporated within-country distributions were taken from household surveys. His calculations show much lower Theil and Gini values (Table 2):

Table 2: Global income inequality based on Gini and Theil indices from 1988 until 2000

	1988	1993	1998	2000
Gini	64.9	64.0	63.8	63.7
Theil	80.8	78.7	78.5	78.3

Source: Data are obtained by Sala-i-Martin (2006): The World Distribution of Income: Falling Poverty and ... Convergence, Period*, p. 384. The Quarterly Journal of Economics, Vol. CXXI, Issue 2, May 2006.

As it was being found out that old PPP-data underestimated price levels dramatically, and as Sala-i-Martin's indices calculated from old 1993-PPP data indeed show comparably very low values, an understatement of world inequality and -poverty can be insinuated. Price levels continually change over time. Therefore, this correction of the PPP price data gives another allusion that speaks against a continually declining movement of global income inequality during the last 20 years.

2.3   Possible reasons for the differing results

Various possible reasons can be deduced leading to the differing results of world income inequality in both the methodological approaches:

► It can be presumed that Sala-i-Martin's results of declining income inequality worldwide can be linked to an underestimation based on using old 1993 PPP data as presented above.

► In his approach, a large amount of missing data was approximated.

► Sala-i-Martin used quintile shares while Milanovic had between 10.8 and 11.4 data points per distribution on average and therefore much more precise distributional information.

► Both the authors used different data sources. Milanovic sees the mix of national account data and microeconomic survey data as not being "distribution neutral".

► The lack of data for Eastern Europe and the former Soviet Union in Sala-i-Martin's sample is another possible reason for the different results. It is not replicable whether he excluded these states on purpose in order to influence the result, or if data access was restricted.

► Finally, the division into rural- and urban areas by Milanovic for very big countries like China and India should also be considered.

3. Own Approach and Hypotheses

3.1 Definition of income, data coverage, and treatment of missing data

Derived from the foregoing comparison of the two referenced authors, this section describes the underlying methodology estimating world income inequality and the poverty threshold for 2000 and 2005 in this analysis. Five hypotheses will be constructed.

Of course, income is not the only manner to measure wealth in the world. Sometimes, income as guideline is not even the most suitable way of describing peoples' living standards or poverty in the world. There have also been attempts of combined approaches, for example expressing the (non-monetary) daily caloric intake in a monetary way.

More ingenious is the Capability Approach of Indian Nobel Prize winner Amartya Sen, an attempt to measure inequality and poverty in a multidimensional way. It accounts for different influencing factors and puts the individual capability and freedom in the centre of the focus: "The capability approach to a person's advantage is concerned with evaluating it in terms of his or her actual ability to achieve various valuable `functionings` as a part of living" (Sen 1993: 30).

Oftentimes, the Capability concept of Martha Nussbaum (1988) is seen as a complementation of this model. As her main field of expertise is ethics and moral philosophy, her concept can be viewed as being more normative compared to Sen's approach. But, both scientists oriented their approaches towards being applicable internationally as they knew that most of today's problems are out of reach from national problem-solving competence (Nussbaum 1999: 31). Compared to the one-dimensional monetary approach, the Capability Concept is much more difficult to implement. In order to be applicable to different societies and cultures, the level of standardization of the model needs to be very low. Due to a high level of

individualization thus accomplished, comparisons between different capability studies of varying cultures are of limited validity.

Nonetheless, many new findings would have never been discovered without the capability approach being the underlying background of the studies[19]. Expressiveness of well-being situations following this concept would be much more ample and would give more precise information about the welfare situations of individuals than a one-dimensional monetary approach.

Unfortunately, there are till date no comparable results offering the same information about inequality and individual well-being for every country. On those grounds, taking this kind of data as a basis comparing individuals' welfare worldwide has to be dismissed. Therefore, it has to be resorted to the use of monetary data, which are easier to access and well comparable.

National account data like the GDP per capita will not be used as mean incomes for estimating world income inequality. Due to costs and availability direct access to survey data from primary sources is restricted. As a compromise, second hand individual income data will be considered. Data sources are the World Bank Living Standard Measurement Survey (LSMS), the World Bank's World Development Reports, and World Development Indicators for all countries or years not included in the here mainly used UNU-WIDER dataset were considered.

Starting from the UNU-WIDER dataset, mean household net incomes and income distributions from surveys for 2000 and 2005 were collected. If there were no exact data available for the two years examined, data of the year before or the year after the benchmark year were taken into consideration. For only 7 countries in 2000, data differing two years from the benchmark year had to be taken in order not to exclude these countries from the analysis. The seven countries make up 1.6 % of

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[19] To only name two exemplary studies that were arranged around the Capability Approach, it is started with one study by Sen himself about life expectancy, survival rates of newborns and child mortality in Brasil, Mexico, PCR, India and Sri Lanka (Sen 1985); another study is by Alkire (2002) who examined goats breeding, literacy rates and the production of a good in a qualitative way which she compared to findings from monetary statistics.

2000's world population and account for 2.1 % of world income[20]. For 2005 it were only 5 countries representing 0.6 % of 2005's world population accounting for 1.9 % of world income[21].

Only for a few countries there was information provided neither by the UNU-WIDER, nor by the datasets of the World Bank. In 2000 for Jamaica, Tanzania, China Urban, China Rural, India Urban, and India Rural; and in 2005 for Germany; United States, China Urban, China Rural, India Urban, India Rural and Ethiopia the mean incomes and/or distribution information were taken from other sources (see Appendix Data Sources).

Some missing individual mean incomes or distributions for 10 countries in 2000 were estimated by mean incomes or distributions of neighbouring countries (see Appendix Data Sources). Alternatively, incomes of others (that were without any suitable reference country regarding size and wealth) have been approximated through the given income of the other examined year for the same country, plus or minus the annual growth rate for the five year period in between (see Appendix Data Sources).

Data that appear to be not plausible viewed in the overall context are approximated by the same procedure as described above. For instance, Venezuela's income for 2000 seemed to be overestimated by being $ PPP 8555 compared to the mean income for 2005 being only $ PPP 2048. As totally falling out of alignment compared to Venezuela's income for 2005, and also compared to the mean incomes of the other countries in that region, an ascertainment error is presumed. Therefore the mean income of $PPP 2048 was taken as a benchmark and the mean annual growth rate during the five year period from the income in 2005 was subtracted. Venezuela's annual growth rates for that period were: 2000: 4.7 %; 2001: 5.9 %; 2002:-7.1 %; 2003: -4.3 %; 2004: 15.4 %[22] which correspond to an average income growth of 13.9 % during these years. Detracting this from the income in 2005 ($ PPP

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[20] Switzerland (1998), Cape Verde (2002), Gambia (1998), Guinea-Bissau (2002), Maldives (1998), Iran (1998), Afghanistan (2002) together making up 94541347 people corresponding to merely 1.6% of the (sample) world population or 2.15% of the world income in 2000.
[21] Austria (2003), Finland (2003), Greece (2003), Luxembourg (2003), Sweden (2003) making up 34072559 people corresponding to 0.57% of the (sample) world population or 1.93% of the world income in 2005.
[22] See Sources: World Bank: Annual growth rates of Household Final Consumption Expenditure.

2048), an income of $PPP 1723 for 2000 will be obtained (see Appendix Data Sources).

All mean incomes are expressed through individual per capita data. The definition of consumption/expenditure from household surveys of the World Bank is as follows:

> "Household final consumption expenditure (formerly private consumption) is the market value of all goods and services, including durable products (such as cars, washing machines, and home computers), purchased by households. It excludes purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to governments to obtain permits and licenses. Here, household consumption expenditure includes the expenditures of nonprofit institutions serving households, even when reported separately by the country" (World Bank: WDI).[23]

For the analysis, 129 countries were included in 2000 and 121 countries in 2005, covering about 93 % of world population in both the years (see Table 3).

Table 3: World population covered by the samples

Population	Total (in millions)	percent
Total population in 2000 (world)	6,079	100 %
Population covered by the sample for 2000	5,661	93 %
Total population in 2005 (world)	6,458	100 %
Population covered by the sample for 2005	5,982	93 %

It was not possible to avoid combining income-based and consumption- or expenditure-based surveys in this thesis. For 2000, 27 % (i. e. 35 countries) of surveys were determined by enquiries about disposable net income. In 7 % (i. e. 9 countries) of the cases, income was not further specified than "income" or

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[23] See Sources: World Bank: World Development Indicators: Definition of Household Final Consumption Expenditure.

"monetary income", whereas in 66 % (i. e. 85 countries) surveys were consumption expenditure-based.

For 2005, 25 % (i. e. 31 countries) of the surveys were examining disposable net income, 11 % (i. e. 13 countries) were not specified further than "income" or "monetary income" and 64 % (i. e. 77 countries) of the surveys asked for consumption expenditure.

This preponderance of consumption expenditure-based surveys would imply to use consumption expenditure income only. But, if different income definitions will not be interfused, at least 34 % or 44 countries for the 2000 sample, and 36 % or, again, 44 countries for 2005 would have to be excluded. As the sample would be too small to give an adequate representation of the world's population, it is required to merge expenditure consumption and disposable income.

According to Milanovic, consumption expenditure surveys "(…) tend to yield lower inequality and higher mean than income-based surveys" (Milanovic 2002a: 61). Also Li et al. (1998) reported this fact, so that other researchers like Banerjee and Duffo (2000) cross-the-board raised individual Gini values by 6.6 points. It follows that the preponderance of consumption expenditure-based data will probably bias the inequality measures used here downward.

Individual data will not be combined with household or family income. Household or family-unit based data are excluded from the sample, since they, in an international or global context, often comprise the problem of varying in definition of who belongs to a household or family (Hoffmeyer-Zlotnik/Warner 1998: 54). Here, only individual per capita incomes will be included.

For analysing regional inequality, the sample countries are divided into geographical regions. Additionally to the division into five geographical regions adopted from Milanovic, a region named "Middle East" was constituted.

3.2   Adjustment for price differences and Purchasing Power Parity

All disposable incomes and expenditure consumption incomes for 2000 and 2005 have been adjusted for price differences in local currency units and converted to common international standard by the Purchasing Power Parity. For this thesis only PPP conversion factors from the World Bank were used. Both 2000 and 2005 data are expressed in 2005 prices (new $ PPP 2005) as to facilitate the comparison between those two years.

To convert local currency units into international dollars, the local currency per capita income is divided by the PPP conversion factor for private consumption data published by the World Bank for 2005 (World Bank)[24]. The World Bank defines the conversion factor as follows:

> "Purchasing power parity conversion factor is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as U.S. dollar would buy in the United States. This conversion factor is for private consumption (i.e., household final consumption expenditure)." (World Bank: Definition of PPP conversion factor for household final consumption expenditure).

One of the leading economists of the Bank of Italy, Andrea Brandolini, summarizes that Purchasing Power Parities possess the force to prevent problems of such conversions caused by the fact that labour-intensive non-tradable services are typically cheaper in poor- than in richer countries. He defines: "(PPPs) are the relative values, in national currencies, of a fixed bundle of goods and services, and provide the conversion rates from national currencies to an artificial common currency (…). Note that PPPs embody both, the conversion to a common standard (…) and the adjustment for price level differences (…)" (Brandolini 2007: 65).

Brandolini mentions that even the usage of PPPs is, like the usage of market exchange rates, not totally free from causing problems and points to the differing methods of estimating PPPs (Brandolini 2007: 65). For this reason, conversion factors in this treatise are taken from only one single source (World Bank[25]).

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[24] See Sources: World Bank: 2005 PPP Conversion Factor.
[25] See Sources: World Bank: 2005 PPP Conversion Factor.

Brandolini also drew attention towards the circumstance that the PPP index for household final consumption expenditure might partly overestimate rich countries' incomes and underestimate poorer countries' incomes. He is giving a Europe-centred example of Germany's and Luxembourg's real incomes being 6 to 11 percent higher, whereas the real incomes of Finland, Latvia, Lithuania, Malta, and Poland tended to be some 8 to 12 percent lower (Brandolini 2007: 66).

Furthermore, the author voices apprehensions concerning the employment of Purchasing Power Parities: "One objection that can be raised against using PPP indices is that it is mistaken to apply the same conversion factor for the poor and the rich, when we know that expenditure composition varies across the income distribution" (Brandolini 2007: 66). Following Milanovic (2002a: 60), in this thesis India and China will be portrayed separately by urban- and rural areas. Therefore, different PPP conversion factors should also be applied for urban- and rural parts of the divided entities. Unfortunately, it is almost impossible to find reliable sources offering separate factors required for the urban- and rural areas. Therefore, in this analysis there has been used only a single conversion factor for urban- and rural parts per country. Nevertheless, country-/town differences will be portrayed sufficiently, as already by the rural-/urban division differences are expressed through highly varying mean incomes. Measured inequality will be presumably higher when this rural-/urban division is undertaken for the biggest Asian countries India and China which together constitute nearly 40% of the world's population during the examined time period.

Based on these methodological provisions, the main hypothesis is formulated:

H1: Global income inequality in 2000 and 2005 will show inequality indices that are higher than the results measured by Sala-i-Martin and will not correspond to his trend of declining global income inequality.

There will be no assumption about whether inequality is higher in 2005 compared to 2000 and vice versa (i.e. a positive trend is not presumed compulsorily). Though, in addition to the first hypothesis, an adjoining presumption is formulated: income inequality in 2000 and 2005 either stagnates or is higher than measured by Milanovic. This presumption will be tested by hypothesis H2:

H2:   Global income inequality in 2000 and 2005 is higher than measured by Milanovic for 1988, 1993, and 1998.

3.3   The estimation of world income inequality and world poverty

As being in line with Sala-i-Martin, all income distribution data points in this work are further divided into quintile shares. This was done, firstly for a better handling, and secondly as decile distributions were not available for each country. To approximate the huge amount of missing decile shares would base results on estimates rather than on data. On the other hand, the usage of quintile shares will have a distorting effect on the results and will probably bias inequality downward.
All quintile data points will be weighted by population representing the country. After the weighting procedure, dividing the country population by five and assigning it to the particular income quintile share, regional and world income distributions are constructed around the mean.

One measure to estimate the spread of incomes across the population is using percentile ratios. The most common percentile ratios[26] P90/P10, the P90/P50, and the P10/P50 shall be applied to estimate the spread of world incomes in 2000 and 2005. For instance, if the P90/P10 ratio is 4.15, the income of the poorest person of the richest 10 % of the distribution is 4.15 times higher than that of the richest person of the poorest 10 % of the distribution. As deviations within the distribution can not be captured by those ratios, various income inequality indices will be computed: namely the Gini coefficient, the Theil index and the Mean Logarithmic

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[26] See Sources: World Bank: Measurement of Living Standards and Inequality.

Deviation (MLD). These three measures were chosen because each one is susceptible to certain sectors of the distribution: the Gini coefficient is sensitive to changes in the middle of the distribution, the Theil index to changes in the upper end, while the MLD is sensitive to incidents at the bottom tail of the distribution[27]. The above named indices as well as the percentile ratios were computed by STATA software[28].

In order to make the results comparable to those traced by Milanovic, the Gini coefficient will likewise be disintegrated according to the Pyatt-type Gini decomposition formula. In section 2.2 (pp.17-18) it was exposed that, according to Shorrocks, the Gini decomposition fulfils the criterion of additivity when being extended by an equation part. As Milanovic noticed an overestimation of the between-country inequality by the totally decomposable indices Theil index and MLD, it was decided to not ignore that homogeneity part wherein the incomes of rich people from poor countries overlap with the ones of poor people from rich countries. Milanovic states: "Note that in a world of large between-country income differences, and very small within-national inequalities, there would be no overlap at all, and 100 % of global inequality would have been caused by between-national differences" (2006: 17).

The inequality indices calculated as well as the results of their decomposition will be compared to the findings of Milanovic (2002a+b, 2009) and Sala-i-Martin (2006). Based on the findings of these two authors, it is presumed that also in this calculation the within-country inequality shall contribute less to overall inequality than the between-country inequality, approximately being around 40:60. Therefore, the third hypotheses shall be:

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[27] See footnotes on inequality measures: footnote 6, p. 11 and footnotes 15 and 16, p. 17.
[28] The author wants to express her gratitude to Sabine Israel from the Institute of Social Science of the University of Oldenburg, for her valuable advice and help in operating STATA software.

H3:   The within-country inequality is smaller than the between-country inequality, both measured by the Gini coefficient or by the Generalized Entropy Indices.

In his publication, Sala-i-Matin exposed an interesting circumstance by extracting a continual decline of the between-country inequality. He assesses a decline of -25 % for the between-country component of the MLD, and a -15 % decrease for the between-component of the Theil index from 1979 to 2000. At the same time, he underlines an increase of the within-component of +23 % (MLD) and +8 % (Theil); both observations reflect large changes for a twenty year period.

Starting in 1979 with a ratio of 72 % (inequality driven by differences between countries) and 28 % (inequality driven by differences within countries), in 2000, he already observes a ratio of 61 % (between) : 38 % (within) (Sala-i-Martin 2006: 391). The idea of a reverse might depict a future in which intra-country inequality plays a similar or even more important role in total inequality as before.

Milanovic also observed an increasing within-inequality component for the Theil index between 1988 and 1993, whereas the within-country component of the Gini remaind unchanged (Milanovic 2002a: 78). Thus, in hypothesis four a growth of the within-country component in global inequality between 2000 and 2005 is assumed:

H4:   The within-country component of world total inequality rises between   2000 and 2005.

Since there is disunity in defining the poverty threshold, the present thesis will follow Sala-i-Martin's (2006) approach by establishing various poverty lines. Poverty rates adjusting the "one-dollar-a-day"-line, the "1.5-dollars-a-day"line, the "two-dollars-a-day" line and the "three-dollars-a-day" line shall be scheduled to price levels of 2005. In 2008, the World Bank declared the "one-dollar-a-day" line to be the "1.25-dollar-a-day" line, not only with regard to the inflation rate but (out of

their view) to a simple underestimation of living costs in the 15 poorest countries of the world. This finally contributes to an increase of 25 % of the earlier $ 1-estimation: "Based on new data, consumption of $1.25 a day in 2005 prices now represents the best estimate of the extreme poverty line. This new line is the average line for the poorest 15 countries" (World Bank 2008)[29]. The lines adjusted in this way to 2005 prices for both years then correspond to $ 456 a year (or $ 1.25 a day), $ 684 a year (or $ 1.875 a day) , $ 913 a year (or $ 2.5 a day) and $ 1369 a year (or $ 3.75 a day). According to the World Bank, poverty rates continue to fall even if data were being recalculated considering the new PPP 2005 price levels[30]. Therefore, also in this analysis the finding of decreasing poverty rates can be presumed. Since an understatement of poverty by Sala-i-Martin's poverty estimates based on 1993 prices is expected, the fifth and last hypothesis for the present investigation shall be:

H5:   Poverty rates show lower values for 2005 than for 2000. They are higher than the rates presented by Sala-i-Martin for 2000.

For implementing this next analysing step, the original information on distribution in decile shares, (before merging adjacent decile shares to achieve quintiles as to standardize them for the calculations with STATA), will be consulted and taken into account. For many countries, the World Bank gives next to quintile shares additional decile share information for the first, the second, the ninth and the tenth deciles of the distribution. Therefore, for those countries the first and the fifth quintiles of the income distribution will be substituted by the respective decile shares, so that there are mostly 7 data points instead of five[31]. Concerning poverty, this will be helpful as especially the bottom end of the world distribution of income reflects the biggest part of the world's poverty situation. Accordingly, the more detailed distributional information by the additional deciles will achieve more precise results. Country

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[29] See Sources: Chen/Ravallion for the World Bank.
[30] See Sources: World Bank: Extreme Poverty Rates Continue to Fall.
[31] Following this, there are distributions included that are constituted out of decile shares and quintile shares: 1st decile, 2nd decile, 2nd quintile, 3rd quintile, 4th quintile, 9th decile, 10th decile.

distributions from the UNU-WIDER database given in decile shares only, will be included for estimating the poverty threshold in 2000 and 2005.

In total, for 2000, there are only six distributions solely based on quintile shares, 46 country distributions are based on additional decile information, and 76 entire country distributions based on decile shares only. For 2005, there are seven quintile country distributions, 62 mixed country distributions, and 52 distributions using solely deciles. Some of the most populated regions, including China Rural and India Rural, are among the distributions exclusively using quintile shares. Unfortunately, most of poverty will presumably be found there. In 2000, the list consisted of Libya, China Rural, China Urban, India Rural, India Urban, and Australia; in 2005 it were the United States, New Zealand, India Rural, India Urban, China Rural, China Urban, and Sierra Leone.

As the World Bank only offers distributional information for China and India as whole countries, the additional presented decile share information could not be used. Therefore, in this analysis sole quintile share country distributions cover a considerable number of people (38 % of world population in 2000; 42 % of world population in 2005) with different incomes which will probably bias the estimation of poverty downward. The resolution of quintile shares is not high enough to separate the individual poverty lines defined. Nevertheless, by applying the urban-/rural division of China and India, the within-country income situation should be covered sufficiently by this analysis. Combining decile and quintile shares to get a more precise distribution than by only using quintiles will not cause any problems in estimating the poverty threshold in a methodological sense. This is because sole quintile shares of different countries do likewise include differing numbers of population which are weighing the shares.

In the following, the hypotheses formulated above are being summarized:

H1: Global income inequality in 2000 and 2005 will show inequality indices that are higher than the results measured by Sala-i-Martin and will not correspond to his trend of declining global income inequality.

H2: Global income inequality in 2000 and 2005 is higher than measured by Milanovic in 1988, 1993 and 1998.

H3: The within-country inequality is smaller than the between-country inequality, both measured by the Gini coefficient or by the Generalized Entropy Indices.

H4: The within-country component of world total inequality rises between 2000 and 2005.

H5: Poverty rates show lower values for 2005 than for 2000. They are higher than the rates presented by Sala-i-Martin for 2000.

4. Minimizing the number of explanations that may be responsible for the differing results in the analyses of Milanovic and Sala-i-Martin

Three of the six possibilities listed in Section 2.3 were being examined in a publication of Capéau and Decoster (2004) and were not being held true by these authors for causing the differing results of global income inequality presented by Sala-i-Martin and Milanovic. Audited were the usage of quintile versus decile shares, the in-/ or exclusion of FSU and Eastern Europe, and the usage of GDP per capita versus mean incomes from surveys. Capéau and Decoster dismissed all three possibilities (Capéau/Decoster 2004: 15). In one assumption some discrepancies within their argumentation can be found.

The first object of investigation is the usage of national account data (GDP per capita) on one hand and mean incomes from household surveys on the other. The GDP per capita includes additional money transfers like governmental spending, investments from profits, stock capital etc. which do not depict the real income situation of world individuals. It also increases more steeply than incomes from household surveys do. Deaton (2003) gives a further argument by his statement:

> "A major problem is that consumption measured from household surveys, which is used to measure poverty, grows less rapidly than consumption measured in national accounts, in the world as a whole, and in large countries, particularly India, China, and the US. In consequence, measured poverty has fallen less rapidly than appears warranted by measured growth in poor countries."(Deaton 2003)

What he points out for measuring poverty is therefore also valid for measuring inequality. Based on this fact, the presumption that Sala-i-Martin (2006) constantly underestimates global income inequality for the period of 1970 to 2000 could be supported. Since the GDP per capita grows much more rapidly than real disposable net incomes or consumption expenditure- based incomes and therefore increases incomes of the poor in the same manner like that of the rich, it may be expected that the results of his inequality measures compulsorily show lower indices and maybe even decreasing world income inequality. In this respect, his results would be driven by the methodology he chose.

Therefore, one could deduce: Global income inequality in 2000 and 2005 measured by individual household survey data, instead of GDP per capita, will show inequality indices that are higher than the results measured by Sala-i-Martin and will not correspond to his trend of sinking global income inequality.

Milanovic himself tested the effect of using the GDP per capita based incomes and substituted his survey-based incomes by them for the countries and years he considered in his analysis. In fact, the results measured by the Theil index and the Gini coefficient changed by this substitution. For 1993, there are lower indices when the GDP per capita is taken as the mean income. Measured by the Gini coefficient, the result is 2.1 points lower (Gini 63.9) than with survey-based incomes (66.0) (Milanovic 2002b: 88, Table 28 and Milanovic 2002a: 78, Table 19). By the Theil

index, the results of applied survey-based incomes are 2.6 points higher than when GDP per capita incomes base the analysis (Theil index: 87.3 based on incomes from surveys versus Theil index: 84.7 based on incomes by the GDP per capita) (Milanovic 2002b: 88, Table 28 and Milanovic 2002a: 78, Table 19). However, for the other examined year 1988, results show higher values when incomes are given by the GDP per capita. By the Gini coefficient, the value based on survey incomes is 62.8 while the one produced by the underlying GDP incomes are 0.5 points higher reaching 63.3. Likewise the Theil index shows a higher value (77.8) when incomes are GDP-based than when they are taken from surveys (76.5) (Milanovic 2002b: 88, Table 28 and Milanovic 2002a: 78, Table 19). The test did not offer uniform evidence and results do not point to a special direction for either supporting or neglecting the assumption. For that reason, Capéau and Decoster conclude that the contradicting results of the two authors Milanovic and Sala-i-Martin remain unexplained (Capéau/Decoster 2004: 13). Therefore, they scrap the idea of a possible explanatory power by using the GDP resulting in Sala-i-Martin's lower indices and declining trend of world income inequality (Capéau/Decoster 2004: 15). Also in this treatise, the focus will be laid on the remaining possible explanations in the following.

The second assumption these two authors examined is the exclusion of the countries of Eastern Europe and the former Soviet Union. Milanovic found out that these countries suffered a high increase of inequality after the collapse of the Eastern block, precisely between 1988 and 1993 (Milanovic 1998, 2002a). Referring to him, Capéau and Decoster argue that the exclusion of these countries by Sala-i-Martin cannot count as a reason driving his low results of the inequality measures. They point to the converging effect that the then following decline of inequality in this region had a few years later: "The collapse of these poorer rich countries, and the fast growth of some richer countries, produced some convergence of mean incomes. More specifically the convergence of the mean income in China and India to the one of Russia and Ukraine pushed the Gini down with between 0.3 and 0.12 points" (Milanovic 2002a: 84-85, Table 22, cited by Capéau/Decoster 2004: 14). It is

the question, if the rising inequality after the collapse of the Eastern block and/or the following decrease of inequality, a few years later, are suitable to explain the extreme differences in the height of the world's income inequality. If so, one could insinuate that Sala-i-Martin might have spared the region from his analysis not because of missing data, but in order to influence the results. But, against the background that the population living in the specified area does not make up more than 5-7 % of world population, this idea sounds far-fetched.

The present treatise is not covering the time period between 1988 and 1993 when inequality in FSU and Eastern Europe increased after the collapse of the Eastern block. Therefore, the question whether the result of inequality indices was influenced by this regional inequality increase will not be answered. Yet the presumption is that in times of increasing inequality in FSU and Eastern Europe, the exclusion of the region would bias the overall inequality values downward. In reverse, in times of decreasing inequality in FSU and Eastern Europe, the exclusion of the region would bias overall inequality upwards.

The test was undertaken for the two years covered in this analysis (in two points in time when inequality in the region is - allegedly - declining). It can be resumed that including FSU and Eastern Europe indeed has an inequality reducing effect in 2000 and 2005. When being excluded from the sample, values of the indices used are slightly higher (see Tables 4.1 for 2000 and 4.2 for 2005).

Table 4.1: Changes in global income inequality by in- or exclusion of Eastern Europe and FSU from the 2000 sample

2000	Gini	Theil	MLD
FSU and Eastern Europe Included	0.711	1.026	1.085
FSU and Eastern Europe Excluded	0.719	1.055	1.132
Change	-0.008	-0.029	-0.047

Table 4.2: Changes in global income inequality by in- or exclusion of Eastern Europe and FSU from the 2005 sample

2005	Gini	Theil	MLD
FSU and Eastern Europe Included	0.711	1.014	1.242
FSU and Eastern Europe Excluded	0.725	1.070	1.306
change	-0.014	-0.056	-0.064

From this, there is to draw the conclusion that the exclusion of region FSU and Eastern Europe by Sala-i-Martin is not responsible, neither for his low-levelled overall inequality indices, nor for the decreasing inequality trend he proclaimed. It also shows that Sala-i-Martin did not exclude the region intentionally in order to influence the result as to lower indices down artificially.

The third assumption that can be dismissed, following the authors Capéau and Decoster, is concerning the question whether Sala-i-Martin's choice of quintile shares, associated with less precise distributional information on within-country inequality, explains his lower results about world inequality and the declining trend he found. This assumption should hold true especially for large countries like India and China. Choosing quintile shares undoubtedly influenced the image of a constantly low between- and an artificially elevated within-country inequality. Capéau and Decoster refer to this point and state that the poor within-country distributional information given by quintiles, as well as the estimation of missing data for years, "(…) in practice led to a constructed lack of variation in his within-component" (Capéau/Decoster 2004: 14).

This statement complies well with Milanovic (2002 b) to whom the two authors refer. He confirmed this assumption on own data calculations on *Concept 2* inequality where the within-component is detracting from the between-component and decreases the overall results of Gini and Theil. Although Capéau and Decoster admit that "in general, quintiles give too poor information on the within

contribution" (Capéau/Decoster 2004: 14), nonetheless they dismissed this plausible explanation. These irregularitiy in argumentation gave reason to prove the effect of using quintile shares in contrast to decile shares on own data. For the test, region LAC was chosen as in this region decile distributions were offered for every country. Results for 2000 are shown in Table 5.1, those for 2005 in Table 5.2.

Table 5.1: LAC 2000 – Differences in regional inequality indices based on the respective choice of quintile or decile shares

Distribution	Gini	Theil	MLD
based on quintiles	0.539	0.505	0.556
based on deciles	0.565	0.583	0.600
change	0.026	0.078	0.044

Table 5.2: LAC 2005 – Differences in regional inequality indices based on the respective choice of quintile or decile shares

Distribution	Gini	Theil	MLD
based on quintiles	0.509	0.437	0.477
based on deciles	0.532	0.502	0.517
change	0.023	0.065	0.040

The values of every inequality index show lower results, if distributional information is given by quintile- instead of decile-shares. The difference ranges from 2.3 to 2.6 Gini points, from 6.5 to 7.8 Theil points and from 4.0 to 4.4 MLD points (Tables 5.1 and 5.2). In contrast to Capéau and Decoster's assumption, the present test obviously gives evidence that the usage of either quintile or decile shares has an undeniable influence on the results. Therefore, this fact is suitable to explain the very low-levelled values of inequality indices experienced by Sala-i-Martin.

To go one step further, it is to test, if his measured downward trend also can be explained by the usage of quintile shares. In order to precisely pursue the changes in values, the LAC- sample has been transformed into a "common" sample including

the same countries for 2000 and 2005. Results for quintile shares are given in Table 6.1, those for decile shares in Table 6.2:

Table 6.1: Changes in inequality indices between 2000 and 2005 based on quintile distributions

Distribution	Gini	Theil	MLD
quintile-based 2000	0.531	0.490	0.547
quintile-based 2005	0.506	0.435	0.477
change	0.025	0.055	0.070

Table 6.2: Changes in inequality indices between 2000 and 2005 based on decile distributions

Distribution	Gini	Theil	MLD
decile-based 2000	0.563	0.571	0.596
decile-based 2005	0.531	0.499	0.517
change	0.032	0.072	0.079

The results of this test do not confirm the foregoing presumption. There is no indication that the observed downward trend in inequality is due to the use of quintile shares by Sala-i-Martin. Regardless of whether the analysis is based on decile or quintile distributions, in both cases there is an inequality decline between 2000 and 2005 (Tables 5.1 and 5.2). Above that, the values of the two years do not differ much from each other: the difference of the Gini between 2000 and 2005 was 0.07 Gini points, the one between the Theil points 0.17, whereas the difference between the MLD values lays at 0.09 (Tables 6.1 and 6.2).

Capéau and Decoster summarize that "none of the three suspects, examined so far, can explain the divergence in the conclusion about the between-term of the inequality change" (Capéau/Decoster 2004:15). Even if they bring forward some arguments supporting the assumption that the use of quintiles might be responsible for the different results, they discard it without critical reflection. Concerning this one point, the argumentation line of these authors is not replicable. In total, Capéau

and Decoster attest Milanovic a more precise calculation of world income inequality than Sala-i-Martin to whom they ascribe too "hastly" estimates. His results ignore the within-country income developments between poor areas which more than just annuls the effect on rich urban areas and fast growing rich OECD countries: "In this respect, it seems that Milanovic gets a better, more accurate estimation of true world income inequality" (Capéau/Decoster 2004: 16).

Although the foregoing test did reveal that the usage of quintile shares does influence the overall results in a not ignorable manner, Capéau and Decoster find the only remaining explanation for the high inequality indices by Milanovic compared to the low indices by Sala-i-Martin and his downward trend in the division into rural- and urban areas of large Asian entities. Milanovic proved their assumption by putting together the divided parts forming whole countries. His results are striking: They show a negative contribution to overall inequality of the Gini's between-country component (Milanovic 2002b: 90, Table 29).

Therefore, Milanovic's division of countries into rural- and urban seems to be, next to the usage of decile shares, another logical explanation for the main differences in results and conclusions between the publications of Sala-i-Martin and him.

In an additional paper, Milanovic tested the role of India, China, Indonesia and Bangladesh on global inequality indices when treated as whole countries (2002b) or divided into rural- and urban parts (2002a) (see Table 7). Indeed, there is the expected difference in height of values of the inequality measures: The Gini coefficient as well as the Theil index show much higher values when measured with a division into rural-/urban parts compared to comprising them as whole countries. In contrast, the downward trend of inequality measures by Sala-i-Martin cannot be confirmed, Milanovic's test does not display a uniform trend. In his analysis, the Gini shows a downward trend, while the Theil rises when whole countries are considered (Table 7).

Table 7: Comparison of Using China, India, Indonesia and Bangladesh as Whole Countries vs. their Division into Rural and Urban Parts

	With urban-/rural division of the data for China, India, Indonesia, Bangladesh			China, India, Indonesia, Bangladesh treated as whole countries		
	1988	1993	change	1988	1993	change
Gini	0.561	0.576	↑	0.551	0.541	↓
Theil	0.584	0.621	↑	0.558	0.567	↑

Source: Milanovic 2002b: 90, Table 29

Also in this analysis, it is tested how inequality measures would change if treating China and India as whole countries (see Table 8). Like Milanovic, the results of the present test reveal higher levels of inequality when a division into rural-/urban areas is undertaken. However, the monotonous downward trend in Sala-i-Martin's results cannot be confirmed by the present investigation (see Table 8).

Table 8: Own Results for treating China and India as whole countries in 2000 and 2005

	With urban-/rural division of the data for China and India			China and India treated as whole countries		
	2000	2005	change	2000	2005	change
Gini	0.711	0.711	-	0.652	0.668	↑
Theil	1.025	1.014	↓	0.844	0.918	↑
MLD	1.084	1.241	↑	0.854	0.914	↑

In total, it can be summarized that the usage of the GDP per capita (instead of incomes from surveys) could neither explain Sala-i-Martin's low inequality levels, nor the by him claimed inequality downward trend. Likewise, the exclusion of the region FSU could explain none of the cases. But while the low inequality levels were examined to be due to the usage of distributional quintile- (instead of decile-) shares, next to the old 1993 PPP data, and the avoidance of dividing big Asian entities into rural- and urban parts, none of the investigated possibilities explained the trend.

Therefore, three possible reasons for the declining trend must remain open: the large number of estimated missing data, the outdated 1993 PPP rates (in which

price level changes and inflation rates are not being taken into consideration) and their application for a 30 year period.

5. Regional Income Inequality

5.1 Results of Gini coefficient, Theil index and Mean Logarithmic Deviation

For the years 2000 and 2005, Table 9 shows regional Gini coefficients calculated for the six geographical regions: Africa, Asia, Latin America and the Caribbean (LAC), Eastern Europe and the former Soviet Union (FSU), Western Europe, North America and Oceania (WENAO) and Middle East. Regarding that five year period, income inequality in Africa slightly decreased by 0.4 Gini points from 60 in 2000 to 59.6 in 2005, while Asia experienced the second largest increase of income inequality by 1.7 Gini points, rising the Gini from 61.7 in 2000 to 63.4 in 2005. The largest inequality increase by 3.7 Gini points took place in the WENAO region, starting with a Gini of 35.5 in 2000 and reaching 39.2 in 2005. The regions FSU and LAC, on the other hand, managed to decrease their Gini results between 2000 and 2005, far more than Africa did. While in FSU a reduction of 2.5 Gini points from 44.1 to 41.6 can be observed, in LAC even a decrease by 2.9 Gini points declining to 51.1 in 2005 is stated. The overall view shows three regions with decreasing- (FSU, LAC, and Afrika) and three with increasing inequality (Asia, WENAO, and Middle East) (Table 9).

Table 9: Regional Gini coefficients in 2000 and 2005: Distribution of persons by $PPP
        income/expenditures per capita

Region	2000	2005	change
Africa	0.600	0.596	-0.004
Asia	0.617	0.634	+0.017
LAC	0.540	0.511	-0.029
FSU	0.441	0.416	-0.025
WENAO	0.355	0.392	+0.037
Middle East	0.419	0.489	+0.070

Figure 1 illustrates the height of regional Gini coefficients visually.
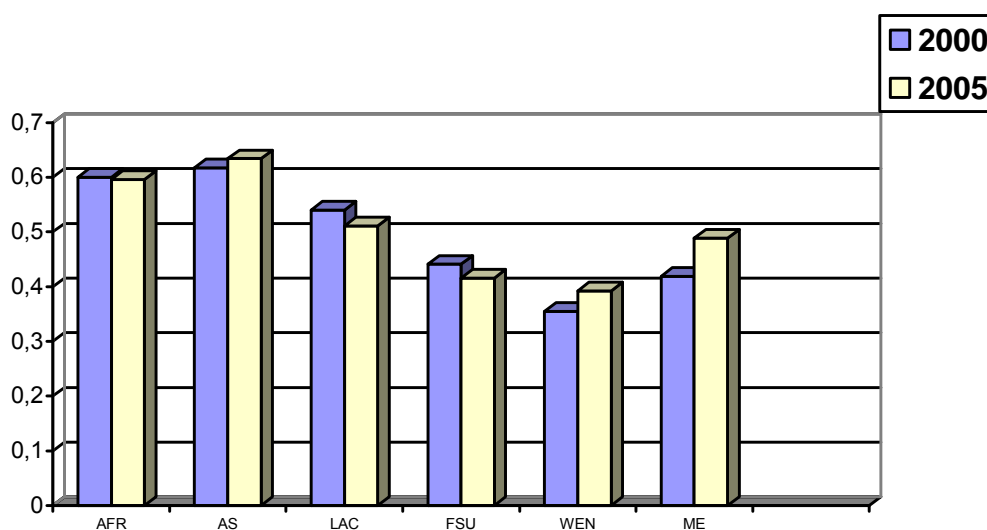
Figure 1: Regional Gini Coefficients in 2000 and 2005

AFR= Africa, AS= Asia, LAC= Latin America and the Caribbean, FSU= Eastern Europe and Former Soviet Union, WEN = WENAO = Western Europe, North America, and Oceania, ME= Middle East.

In most cases, the results for the Theil index and the MLD align with the picture of inequality as given by the Gini coefficient (see Tables 10.1 to 10.6). In the two regions LAC and FSU (Tables 10.1 and 10.2), the Theil index and the MLD likewise show a lower value for 2005 than for 2000. While in LAC the Theil decreased about 6.4 Theil points, from 50.5 to 44.1, the MLD even shows a decrease of 7.8 points, abating to 47.9 in 2005 (Table 10.1).

Table 10.1: Regional Inequality: LAC - Gini, Theil and the MLD, 2000 and 2005

	number of observations	Standard-deviation	Gini	Theil	MLD
2000	100	2454	0.540	0.505	0.557
2005	85	2975	0.511	0.441	0.479
change			-0.029	-0.064	-0.078

For FSU (Table 10.2) the Theil index declines by 7 points whereas the MLD only shows a decrease of 4.2 points. WENAO and Middle East were the two regions where the Gini-, as well as the Theil-, and MLD-measured inequality rose. In WENAO (Table 10.5), inequality increased by merely 4.7 Theil- or 5.3 MLD-points, whereas in Middle East (Table 10.6)the highest increase of about 12 points can be found, measured by both, the Theil index and the MLD.

Table 10.2: Regional Inequality: FSU - Gini, Theil and the MLD, 2000 and 2005

	number of observations	Standard-deviation	Gini	Theil	MLD
2000	125	3197	0.441	0.343	0.361
2005	125	2994	0.416	0.273	0.319
change			-0.025	-0.070	-0.042

In Africa and Asia (Tables 10.3 and 10.4) the pattern is a bit more fragmented: Although the Gini coefficient and the MLD values for Africa (Table 10.3) show slightly decreasing inequality (Gini: -0.4, MLD: -3.7 points), the Theil index presents an increase of even 9.8 Theil points. For Asia (Table 10.4), again, the upper-sensitive Theil index expresses the reversed result of the Gini coefficient by declining 9.2 Theil points whereas the Gini coefficient rises by 1.7 Gini points. The MLD experiences a more distinct descent than the Theil index: it even drops by 24.5 MLD points.

Table 10.3: Regional Inequality: Africa - Gini, Theil and the MLD, 2000 and 2005

	number of observations	Standard-deviation	Gini	Theil	MLD
2000	175	3302	0.600	0.669	0.706
2005	150	7324	0.596	0.767	0.669
change			-0.004	+0.098	-0.037

Table 10.4: Regional Inequality: Asia - Gini, Theil and the MLD, 2000 and 2005

	number of observations	Standard-deviation	Gini	Theil	MLD
2000	105	4346	0.617	0.913	0.713
2005	90	3957	0.634	0.821	0.958
change			+0.017	-0.092	+0.245

Rising inequality in WENAO and Middle East (Tables 10.5 and 10.6) is indicated by all three inequality indices: the distribution's middle-sensitive Gini, the upper-sensitive Theil index and the bottom-sensitive MLD. In Middle East (Table 10.6) there was a stronger increase of inequality than in WENAO (Table 10.5).

Table 10.5: Regional Inequality: WENAO - Gini, Theil and the MLD, 2000 and 2005

	number of observations	Standard-deviation	Gini	Theil	MLD
2000	105	11009	0.355	0.202	0.217
2005	115	11107	0.392	0.249	0.270
change			+0.037	+0.047	+0.053

Table 10.6: Regional Inequality: Middle East - Gini, Theil and the MLD, 2000 and 2005

	number of observations	Standard-deviation	Gini	Theil	MLD
2000	35	2456	0.418	0.309	0.306
2005	40	4298	0.489	0.438	0.428
change			+0.071	+0.129	+0.122

5.2   The development of mean- and median incomes by region

To further examine which level of incomes the analysis is based upon, the mean- and median incomes as well as their changes between 2000 and 2005 will be presented in Tables 11.1 to 11.6. In the tables' bottom rows, additional information is given about the number of observed income shares, and the minimum-/maximum income reported in the different regions. Percentages are written in brackets.

For clarity of presentation serves Figure 2, presenting mean- and median income in 2000 and 2005 by region as a bar chart.
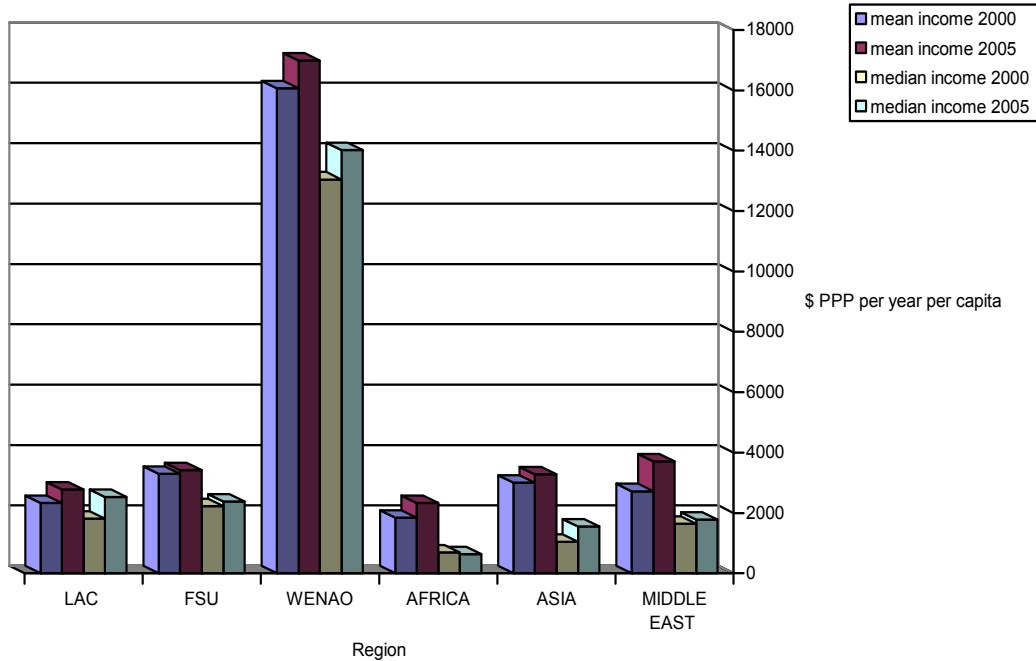
Figure 2: Regional mean- and median income in 2000 and 2005

The lowest mean incomes were measured for Africa, being $ PPP 1843 in 2000 and $ PPP 2331 in 2005 (see Figure 2 and Table 11.2). As expected, the highest mean incomes for 2000 and 2005, both, were found in WENAO being $PPP 16.074 and $PPP 16.990 (see Table 11.1).

At a first glance, it can be traced that mean incomes increased in every region between 2000 and 2005. The highest increase was found in Middle East (27 %) (Table 11.3), followed by Africa (21 %) (Table 11.2), FSU (20%) (Table 11.6), LAC (16 %) (Table 11.5), and Asia (9 %) (Table 11.4).

Table 11.1: WENAO mean- and median income per year per capita in $ PPP in 2005 prices

	2000	**2005**	**change (in percent)**
Mean income	16074	16990	+916 (+5 %)
Median income	13047	14022	+975 (+7 %)
min. income	1805	2700	+895

49

max. income	60713	67113	+6400
number of observations	105	115	+10

In every region, except Africa and Middle East, median incomes grew faster than mean incomes did. Although in WENAO the growth of mean income was faster than the growth of median income by 2 percent (Table 11.1), the increase could not reverse the high increase in inequality in the whole region WENAO (see Table 10.5). Regardless of the observation that Africa (Table 11.2) performed very well in the increase of mean incomes (+21 %), median incomes did decline by about 10 % between those two examined years. Nonetheless, there is slightly decreasing inequality in the whole region Africa measured by Gini and MLD (see Table 10.3). This could be affiliated with the assumption that Africa was much wealthier in 2005 compared to 2000; and that especially the rich people could improve their income situation even further (indicated by the increase of upper-sensitive Theil index) while the masses did still suffer financial hardship (as showed by the decline of middle-sensitive Gini and bottom-sensitive MLD). Besides that, higher minimum incomes are found in 2005 compared to 2000 (Table 11.2) which also could have driven the sinking inequality (indicated by Gini and MLD) in the whole region (Table 10.3).

Table 11.2: Africa mean- and median income per year per capita in $ PPP in 2005 prices

	2000	**2005**	**change (in percent)**
Mean income	1843	2331	+488. (+21 %)
Median income	693	629	-64 (-10 %)
min. income	51	79	+28
max. income	30400	85039	+54639
number of observations	175	150	-25

Similarly in Middle East, the much higher increase of mean incomes (nearly 4 times) compared to median incomes signifies that mainly rich people got much wealthier than poor people did (Table 11.3). This development is also expressed by the

increase of all inequality indices (Table 10.6) and by the large increase of maximum incomes (Table 11.3).

Table 11.3: Middle East mean- and median income per year per capita in $ PPP in 2005 prices

	2000	2005	change (in percent)
Mean income	2720	3704	+984 (+27 %)
Median income	1644	1773	+129 (+7 %)
min. income	283	377	+94
max. income	10268	22938	+12670
number of observations	35	40	+5

Asia shows a reversed picture. Between those two years, the median incomes did grow almost 4 times (33 %) faster than the mean income (9 %) did (Table 11.4). This could serve to indicate that especially the middle class did benefit by improving their income situation. Nevertheless, the region experienced an increase in total inequality values from 61.7 to 63.4 Gini points and from 71.3 to 95.8 MLD points (Table 10.4). Taking the development of measured minimum and maximum incomes of these two years into account (Table 11.4), it can be stated that the richest people did equalize towards the middle (as also indicated by sinking inequality measured by the upper-sensitive Theil index). Inequality would also have decreased measured by the middle-sensitive Gini and bottom-sensitive MLD, if also the poorest people would have levelled up towards the median, but in contrary, considering the decline of minimum incomes (Table 11.4) we find that the poorest in Asia became even poorer in 2005 compared to 2000. This could have driven total inequality upwards in the region as showed by Gini and MLD (Table 10.4).

Table 11.4: Asia mean- and median income per year per capita in $ PPP in 2005 prices

	2000	2005	change (in percent)
Mean income	2999	3282	+283 (+9 %)

Median income	1039	1553	+514 (+33 %)
min. income	156	20	-136
max. income	25017	24125	-892
number of observations	105	90	-15

The remaining regions LAC and FSU (Tables 11.5 and 11.6), both, show a decrease indicated by all inequality indices for 2005 compared to 2000. In both regions, the mean- and the median-income increased. Especially in LAC (Table 11.5), the middle class and the poorer people of the income distribution did benefit and are better off in 2005 than in 2000. The median nearly rose about twice (29 %) to the mean income (16 %). While the measured minimum income of the poorest increased by about $ PPP 56 (58 %), the maximum income declined by $ PPP 630 (-4 %) (Table 11.5). Altogether, this convergence reduced the regional Gini about 2.9 points from 54 to 51.1; the Theil about 6 points (from 50.5 to 44.1); and the MLD about 8 points (from 55.7 to 47.9) (Table 10.1).

Table 11.5: LAC mean- and median income per year per capita in $ PPP in 2005 prices

	2000	2005	change (in percent)
Mean income	2327	2770	+443 (+16 %)
Median income	1805	2531	+726 (+29 %)
min. income	96	152	+56
max. income	15335	14705	-630
number of observations	100	85	-15

In FSU, the mean income grew about three times (20 %) to the median (6 %) of that region (Table 11.6). Nonetheless, there was equalization especially from the upper-end maximum incomes towards the middle standing in line with the decrease of the Gini coefficient by 2.5 Gini points, the Theil index by 7 points, and the MLD by 4.2 points (Table 10.2).

Table 11.6: Eastern Europe and FSU mean- and median income per year per capita in $ PPP in 2005 prices

	2000	**2005**	**change (in percent)**
Mean income	2720	3412	+693 (+20 %)
Median income	2219	2372	+153 (+6 %)
min. income	173	182	+9
max. income	17269	13983	-3286
number of observations	125	125	0

5.3 Inequality decomposition

Table 12 shows the inequality decomposition results for the two Generalized Entropy Indices divided into the within-country and between-country components, as well as for the Pyatt-type Gini decomposition with its additional overlapping-component.

In total, for 2000 there are three out of six regions wherein the within-component is explicitly higher than the between-component (LAC, WENAO and Middle East) measured by all applied inequality indices. For one Region (FSU), only the Theil index and the MLD show higher within- than between-components, while the within-value of the Gini decomposition lies still under that of the Gini's between-component. In the two remaining regions, Asia and Africa, the between-country inequality indicated by all three measures lies high above the within-component indicating that inequality in these regions is mainly driven by the between-component (Table 12).

In 2005 as well, there are three regions, wherein the within-country-component is higher than the between one (LAC, WENAO, and now FSU instead of Middle East). For Middle East, only the within-component of the Gini coefficient shows a higher value than the between-component, whereas the Theil index and the MLD do

present opposed results. Here also, inequality in Africa and Asia is still driven by the between-country components of their regions (Table 12).

The higher within-country values for three out of six regions for each year plus the higher within-component of the MLD's within-component for FSU in 2000 (Table 12) can be regarded as a first indication of a rising importance of the within-country inequality on total inequality. The average ratio of the within- to the between-component is 58:42, measured by the Theil index. The within-component changes one point to 59:41 in 2005. The MLD, with a picture of about the same frame for 2000, shows likewise 59:41, but slightly lowers in 2005 towards 57:43 (Table 12).

Milanovic warned of an overemphasis of the between-component obtained by additively decomposable Generalized Entropy Indices. It should be kept in mind that he explained this circumstance as follows: Any inequality not being zero has to feed the overlap-component while detracting from the within-component (Milanovic 2002a: 83). The present analysis, however, resulted in an overemphasized within-component in some cases [32] as no overlapping-component is there that could detract from the within-component.

By ignoring the overlap-component, which reflects the overlapping income of poor people from rich countries and rich peoples' income from poor countries, the within-country component is obviously overvalued by the results. This is because the overlap-component detracts from the within-component, but, at the same time, the within-component detracts much more from the between-component. The higher the within-component grows, the more the between-component decreases and the overlap-component gains, but to a much lesser extent than the within-component.

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[32]LAC 2000 by the Theil index and the MLD, FSU 2000 by the MLD, WENAO 2000 by Theil index and the MLD, and Middle East 2000 by Theil index and the MLD; LAC 2005 by the Theil index and the MLD, FSU 2005 by the Theil index and the MLD, and WENAO by the Theil index as well as by the MLD as presented in Table 12.

If now the average values of the components for the Gini decomposition are considered (Table 12), there can be observed a slightly different result than measured by the Generalized Entropy Indices. As presumed, for both years 2000 and 2005, the within-component of the Gini coefficient does not exceed the value of the between-component. In 2005 the within-, and alike to a less extent the between-component, did decrease. In four regions (LAC, FSU, WENAO, Asia) the overlap-component did increase between 2000 and 2005 (saying that the population of these regions became more homogenous concerning their income situations) while it decreased in Africa and Middle East. Except from FSU in 2000, Asia in 2000, and Africa in 2005, within the remaining regions, more than half of the regional population have overlapping incomes. The average values for the within- between- and overlap-components are as follows: for 2000 in the given order 22:22:56, and 13:19:68 for 2005 (Table 12). From this, it can be concluded that regional income inequality measured by the Gini coefficient, is still due to between-country differences. The opposite results given by the other two indices are to be considered with caution as the within-component seems to be overstated to an extent that cannot be assessed in detail.

Table 12: Regional Inequality Decomposition, 2000 and 2005 (Percentages are given in brackets)

	Gini	within	between	over-lapping	Theil	within	between	MLD	within	between
2000										
LAC	0.541	0.191 (35)	0.042 (8)	0.308 (57)	0.505	0.464 (92)	0.041 (8)	0.558	0.515 (92)	0.043 (8)
FSU	0.442	0.120 (27)	0.147 (33)	0.174 (39)	0.344	0.173 (50)	0.170 (50)	0.361	0.210 (58)	0.151 (42)
WENAO	0.355	0.141 (40)	0,026 (7)	0.188 (53)	0.201	0.173 (86)	0.029 (14)	0.217	0.186 (86)	0.032 (14)
Asia	0.617	0.039 (6)	0.281 (46)	0.297 (48)	0.912	0.141 (15)	0.772 (85)	0.712	0.145 (20)	0.568 (80)
Africa	0.600	0.068 (11)	0.213 (36)	0.319 (53)	0.669	0.271 (41)	0.398 (59)	0.706	0.283 (40)	0.422 (60)
Middle East	0.419	0.048 (12)	0.021 (5)	0.350 (84)	0.311	0.203 (65)	0.107 (35)	0.309	0.182 (59)	0.124 (41)

average		22	22	56		58	42		59	41
2005										
LAC	0.511	0.095 (19)	0.024 (5)	0.392 (77)	0.440	0.415 (94)	0.025 (6)	0.479	0.454 (95)	0.026 (5)
FSU	0.416	0.089 (21)	0.019 (5)	0.308 (74)	0.273	0.167 (61)	0.106 (39)	0.319	0.169 (53)	0.149 (47)
WENAO	0.392	0.093 (24)	0.034 (9)	0.265 (68)	0.249	0.209 (84)	0.040 (16)	0.270	0.231 (86)	0.039 (14)
Asia	0.635	0.041 (7)	0.136 (21)	0.458 (72)	0.820	0.174 (21)	0.647 (79)	0.958	0.262 (27)	0.697 (73)
Africa	0.596	0.041 (7)	0.429 (72)	0.126 (21)	0.767	0.363 (47)	0.404 (53)	0.669	0.289 (43)	0.381 (57)
Middle East	0.489	0.056 (11)	0.026 (5)	0.407 (83)	0.437	0.211 (48)	0.227 (52)	0.428	0.173 (40)	0.255 (60)
average		13	19	68		59	41		57	43

5.4   Regional poverty rates

While still dealing with regional inequality, the focus will now be narrowed from regional inequality to the regional poverty threshold, so that the population living below various poverty lines, as defined in Section 3, will be regarded. Taking the additional distributional information into account[33], the following results are presented in Tables 13.1 to 13.5. Moreover, the particularly interesting results for LAC, Asia and Africa are being illustrated by Figures 3.1 to 3.3. Generally, the population shares are given in thousands, except for the densely populated Asia (Table 13.5), where population shares are given in millions. For WENAO, there were no observations under the poverty threshold.

In three regions (FSU, Asia and Middle East), the number of people living below any of the defined poverty rates decreased.

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[33] For explanation about the integration of additional decile distribution shares see page 30.

Table 13.1: Poverty Rates in Eastern Europe and FSU - 2000 and 2005 ($ PPP in 2005 prices)

Individual poverty lines	2000		2005		population change in percent
	in thousands	in percent of total population	in thousands	in percent of total population	
less than $ 1.25/day or $456/year	27,154	7	10,909	3	-4
less than $ 1.875/day or $684/year	58,194	15	19,274	5	-10
less than $ 2.5/day or $913/year	86,660	23	34,260	9	-14
less than $ 3.75/day or $1369/year	145,133	38	57,305	14	-24

Table 13.2: Poverty Rates Middle East - 2000 and 2005 ($ PPP in 2005 prices)

Individual poverty lines	2000		2005		population change in percent
	in thousands	in percent of total population	in thousands	in percent of total population	
less than $1.25/day or $456/year	13,924	5	10,110	3	-2
less than $1.875/day or $684/year	27,803	9	20,221	5	-4
less than $2.5/day or $913/year	65,657	22	34,245	9	-13
less than $3.75/day or $1369/year	118,853	40	88,924	23	-17

Although mean- and median incomes did upswing in LAC (Table 13.3) and Africa (Table 13.4), both regions were the only ones in which the number of people living below the poverty threshold increased.

Table 13.3: Poverty Rates LAC - 2000 and 2005 ($ PPP in 2005 prices)

Individual poverty lines	2000		2005		population change in percent
	in thousands	in percent of total population	in thousands	in percent of total population	
less than $1.25/day or $456/year	90,439	18	115,577	24	+6
less than $1.875/day or $684/year	138,764	28	171,016	36	+8
less than $2.5/day or $913/year	191,133	38	229,356	47	+9
less than $3.75/day or $1369/year	261,057	53	318,896	67	+14
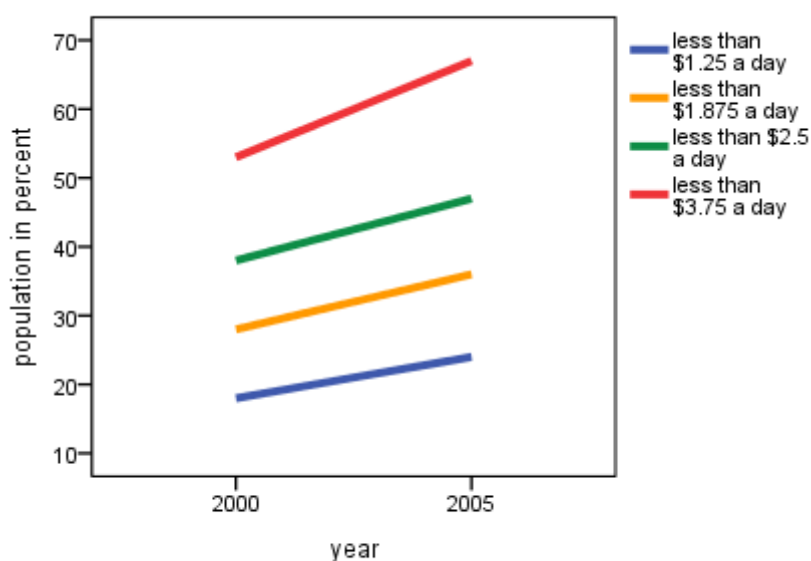
Figure 3.1: LAC – Development of poverty rates between 2000 and 2005

In the region LAC (Table 13.3), the number of inhabitants living in absolute poverty (less than $ 1.25/day) increased by 6 % constituting 24 % of the region's citizens in 2005. In Africa the number of people with less than $ 1.25 a day decreased in 2005 by 1 % to reach 40 % of the total population in that region. (Irrespectively, the number of extreme poor people from Africa is still nearly twice as high as in LAC.)

In contrast, the other three poverty lines for Africa show an increasing trend (Figure 3.2), a similar development as in LAC (Figure 3.1) where poverty rates rose measured by all poverty lines. The number of citizens in Africa living with less than $ 1.875 a day increased by 3 % reaching a value of 67 % of the total population of that region in 2005 – that means that much more than half the population of Africa is poverty-stricken (Table 13.4). In LAC (Table 13.3), the poverty rates contributing to this line did rise about 8 % from 28 % in 2000 to 36 % in 2005. The value of the third line (less than $ 2.5/day) rose by 9 % to 47 % in 2005; the fourth line by 14 % to 67 % in 2005. In the same year almost 70 % of LAC's inhabitants can be declared as being poor, while in 2000 it was just over half of the population.

Although the number of people in Africa living with less than $ 1.25 a day nearly corresponds to the number of people in LAC living under the first poverty threshold, the growth rates expressed in percentages are smaller in Africa than in LAC, remaining between +2 % and +3 %. When based on the fourth poverty line, about 70 % of Africa's people can be declared as suffering poverty. This roughly corresponds to the data existing for LAC in 2005 by 67 % (Table 13.3).

Table 13.4: Poverty Rates Africa - 2000 and 2005 ($ PPP in 2005 prices)

Individual poverty lines	2000		2005		population change in percent
	in thousands	in percent of total population	in thousands	in percent of total population	
less than $1.25/day or $456/year	268,416	41	303,141	40	-1
less than $1.875/day or $684/year	358,965	54	422,592	57	+3
less than $2.5/day or $913/year	408,514	62	479,359	64	+2
less than $3.75/day or $1369/year	474,471	72	553,868	74	+2
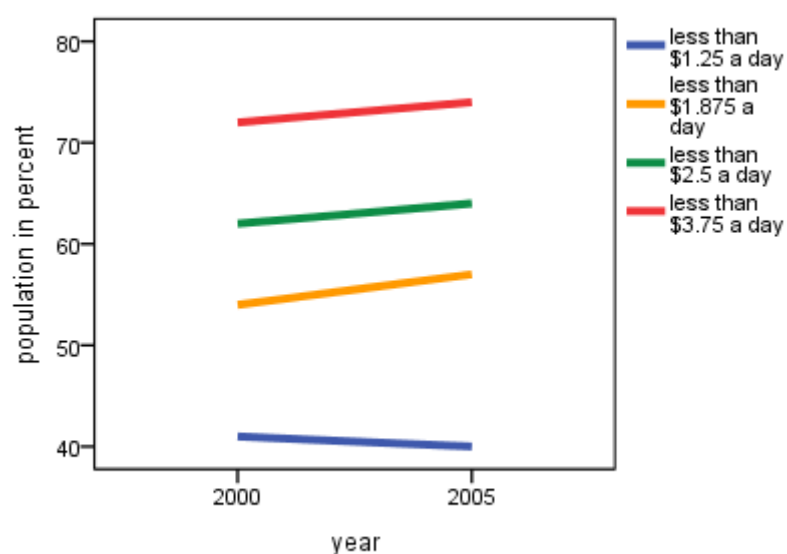
Figure 3.2: Africa – Development of poverty rates between 2000 and 2005

The largest success in lowering the poverty rates between those two years was obviously made by Asia with negative growth rates between -24 and -30 percent.

Table 13.5: Poverty Rates Asia - 2000 and 2005 ($ PPP in 2005 prices)

Individual poverty lines	2000		2005		population change in percent
	in thousands	in percent of total population	in millions	in percent of total population	
less than $1.25/day or $456/year	1,097	35	346	11	-24
less than $1.875/day or $684/year	1,485	48	592	18	-30
less than $2.5/day or $913/year	2,050	66	1,001	31	-35
less than $3.75/day or $1369/year	2,428	78	1,667	52	-26
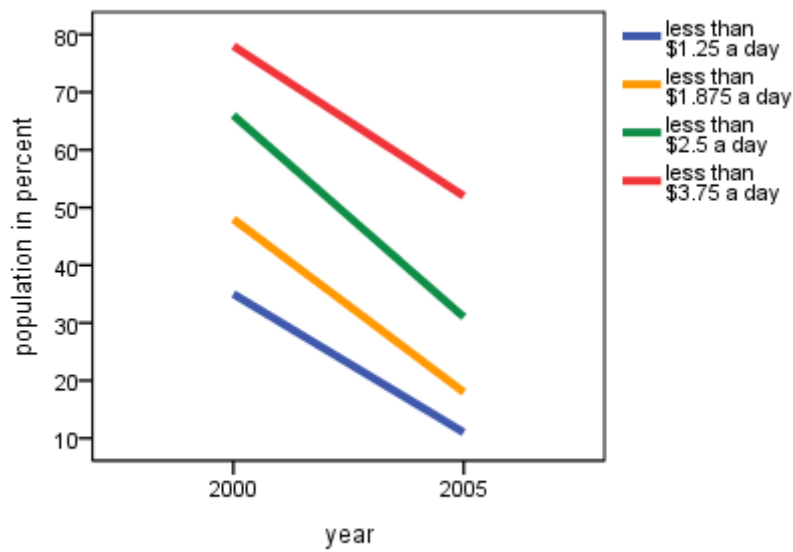
Figure 3.3: Asia – Development of poverty rates between 2000 and 2005

Figures 4.1 to 4.4 illustrate poverty development in the two regions LAC and Asia from 2000 to 2005, those regions in which inequality increased (LAC) and declined (Asia) the most. The pie charts show the population share living below various poverty lines. While in 2000, just over half of LAC's population was living under one of the poverty lines, 47 % of the population did not live below any poverty line. 18 % of the inhabitants suffered from extreme poverty, another 10 % more, i.e. 28 % of LAC's population still lived below the second established poverty line. Another 10 %, that is to say 38 % of the total population, lived with less than $PPP 2.5/day while the remaining 15 % lived with less than 3.75 $/day. Regarding the number of people that is not living below any poverty line, it is interesting to observe that in LAC that number unfortunately declined from 47 % in 2000 to 33 % in 2005. In Asia, on the other hand, this population share has more than doubled and increased from 22 % in 2000 to 48 % in 2005.
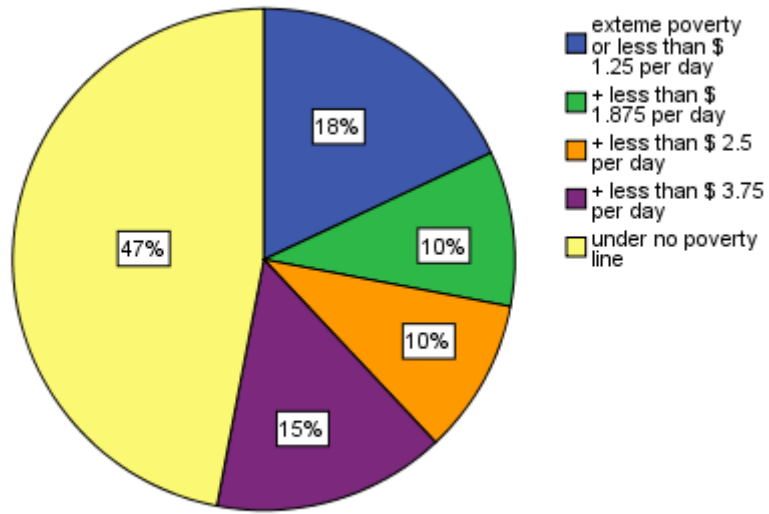
Figure 4.1: LAC 2000 – Population share below various poverty lines
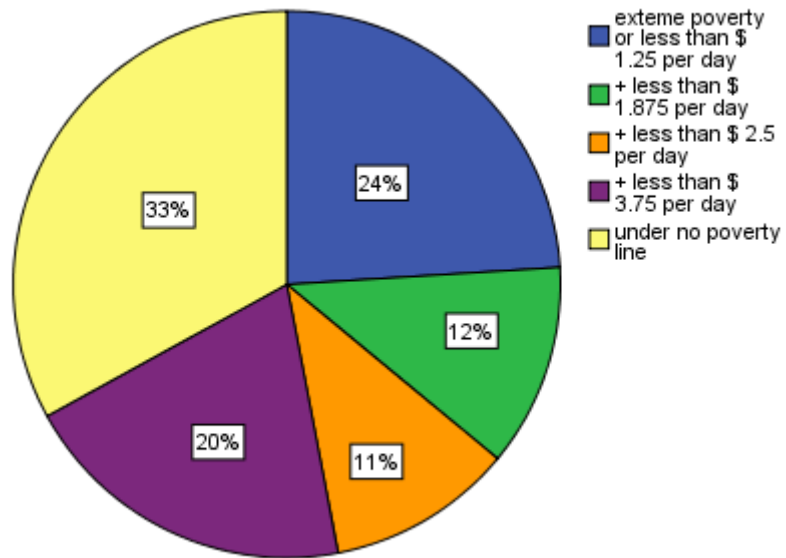
Figure 4.2: LAC 2005 - Population share below various poverty lines
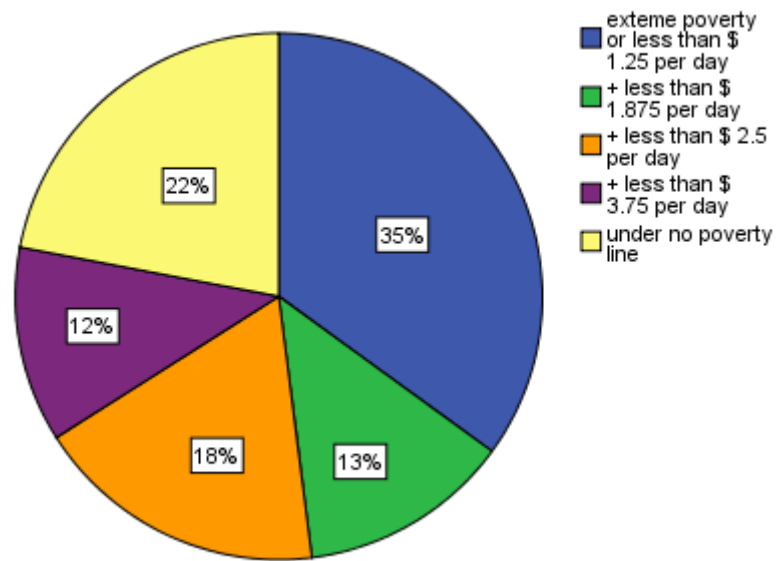
Figure 4.3: Asia 2000 - Population share below various poverty lines
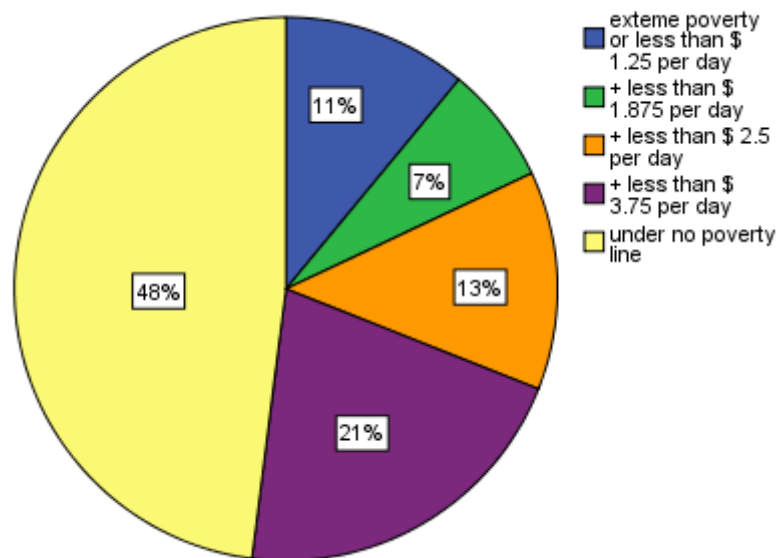
Figure 4.4: Asia 2005 - Population share below various poverty lines

5.5   Summary of Results: Regional Inequality

The regional Gini coefficients indicate large inequality decrease in the regions LAC (-2.9 points) and FSU (-2.5 points) and only a slight inequality decrease in region Africa between 2000 and 2005, meaning that these regions became more homogenious. On the contrary, Middle East experienced the largest inequality

increase (+7 points) followed by WENAO (+3.7 points) and Asia (+1.7 points) indicating that heterogeneity in these regions rose. The most unequal regions between these to points in time were Asia (with Gini coefficients ranging between 61.7 and 63.4), followed by Africa (Gini coefficients ranging between 60 and 59.6), and LAC with Gini coefficients between 54 and 51.1. Down the mark 50, the fourth most unequal region is Middle East (with Gini coefficients ranging between 41.9 and 48.9). The second lowest income inequality was found in FSU (Gini coefficients between 44.1 and 41.6) whereas the lowest inequality was observed in WENAO with Gini coefficients ranging between 35.5 in 2000 and 39.2. From this, it could be constructed a hypothesis saying: The richer a region is, the less inequality is to be found.[34] Most of the times, results of the MLD and the Theil index align with these results. Only in two cases (Africa and Asia) the data of the three applied indices did not give uniform results. While the Gini coefficient and the MLD indicate slight inequality decline in region Africa, the distribution upper-senstive Theil index shows slightly increasing inequality. Unlike in Asia, the upper-sensitive Theil index shows declining, while the middle-sensitive Gini coefficient and the bottom-sensitive MLD show rising inequality. Mean incomes did increase in every region. The growth of median incomes did exceed the growth of mean incomes in three out of six regions: Asia, LAC, and WENAO. The growth of median incomes did remain below the growth of mean incomes in Middle East and FSU. The median incomes in Africa even declined by 10% between 2000 and 2005 while the mean income of the region increased by 21 %. The lowest mean- and median incomes were observed in Africa, the highest in WENAO.

From these data, it was assumed that especially the rich people in the region Africa could improve their income situation while the masses could not, as indicated by the decline of middle-sensitive Gini and bottom-sensitive MLD on the one end, and increasing upper-senstive Theil index on the other. Similarly in Middle East, only

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[34] Till today, there has been less research on the empirical relationship between economic growth, poverty and inequality. However, Ferreira and Ravallion (2009) investigated the correlation strength between those three dynamics and conclude concerning inequality: "Economic growth tends to be distribution-neutral on average in developing countries, in that inequality increases about as often as it decreases in growing economies" (Ferreira/ Ravallion 2009: 625). Therefore, the above constructed hypothesis could not hold true in general. Concerning poverty, on the other hand, the two authors claim: "Measures of absolute poverty tend to fall with economic growth in developing countries" (Ferreira/ Ravallion 2009: 625).

the people at the top end of the distribution are better off in 2005 compared to 2000. On the contrary, in Asia especially the amount of people in the middle of the distribution became wealthier, while the richest ones did equalize towards the middle, and the bottom end worsened concerning their income situations as indicated by the rising Gini coefficient and MLD, declining Theil index, as well as decreasing minimum- and maximum incomes. There was observed unambiguous convergence in the regions FSU and LAC resulting in declining inequality, next to a clear divergence in region WENAO which increased the inequality level of the region.

From the decomposition data, it can be concluded that in LAC, WENAO, and Middle East the within-nation inequalities are explicitly higher than the between-country inequalities. Contrary to that, the regions Africa and Asia are more heterogeneous indicated by higher between- than within-country inequalities. It has been pointed out that the within-country inequality measured by the Generalized Entropy Indices seem to be overvalued.

While in FSU, Middle East, and especially in Asia the amount of people living below all four applied poverty lines decreased, in Africa and LAC poverty rates increased. This result allows to agree with the finding by Sala-i-Martin saying that formerly, "poverty was mostly an Asian phenomenon 30 years ago (…), poverty is, today, an essentially African problem" (Sala-i-Martin 2006:392).

6. World income inequality

6.1 World income distribution and the development of mean- and median incomes

Figure 5.1 shows the kernel density function of world income distribution in 2000 and 2005. It obviously depicts the decreasing number of people situated at the bottom end of the income distribution as the 2005 curve's progression remains below the one of 2000. The 2005 curve tends to shift to the right of the 2000 curve which illustrates the increase of income compared to 2000. For a better view see Figure 5.2 which gives an enlarged section of the lower end of the distribution

ranging to $ PPP 1000 per year per capita. On the right-sided end, there is a very dense hill reflecting the rich pole of the world income distribution. The curve of 2005 is Lorenz-dominant over the 2000 curve as the total mean- but also the total median income is higher in 2005 than in 2000. However, the two curves do intersect twice, meaning that the income in 2005 is not generally higher than in 2000 at every point of the distribution. Therefore, it can be stated that there is not a stochastic dominance.

The mean world income in 2000 was $ PPP 4,464 per capita per year, approx. 22 % lower than in 2005 ($PPP 5,465). The median income in 2005 was $ PPP 2,531 per capita and year, about 40 % higher than in 2000 ($PPP 1,798) (see Table 14 and Figure 5.1).

The fact that median incomes grew faster than mean incomes implies that the bounds of the distribution are narrower. This indicates declining inequality which aligns well with the findings from the kernel distribution.
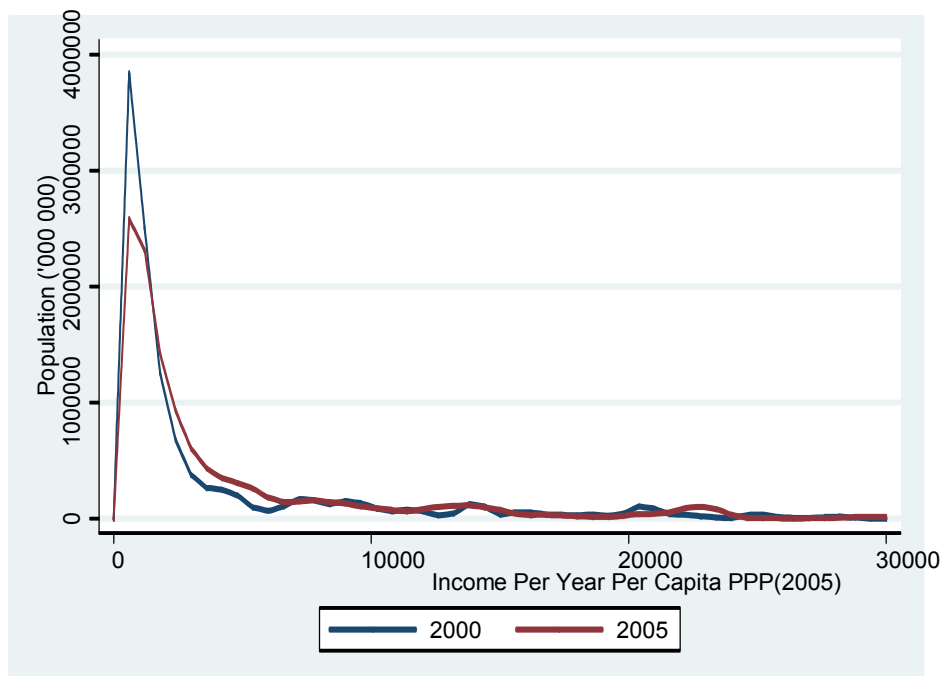
Figure 5.1: World income inequality in 2000 and 2005
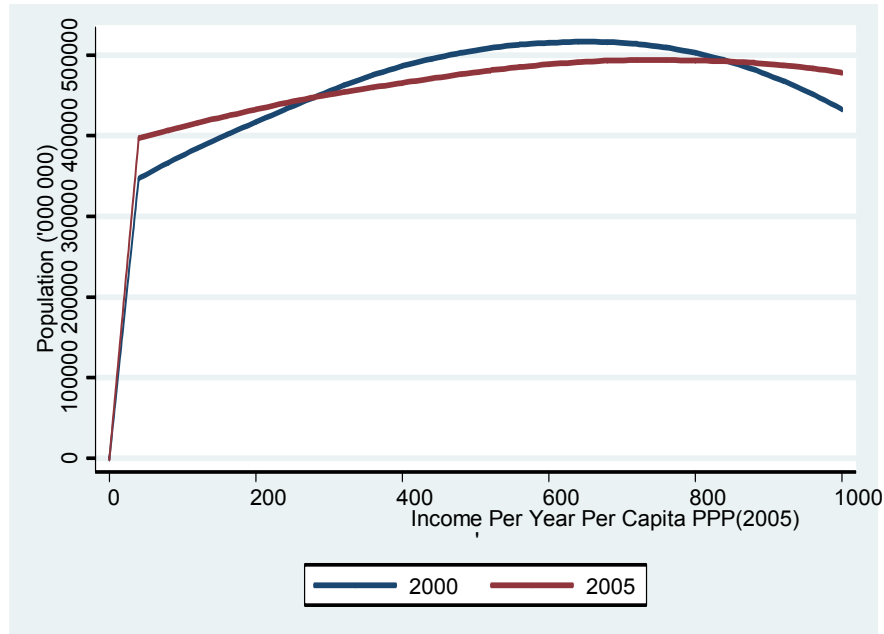
**Figure 5.2: World income inequality in 2000 and 2005 –
Enlarged view up to $PPP 1,000**

Table 14: World mean- and median income per year per capita in $PPP in 2005 prices

	2000	**2005**	**change (in percent)**
Mean income	4464	5465	+1001 (+22 %)
Median income	1798	2531	+733.06 (+41 %)
min. income	51	20	-32
max. income	60712	85039	+24326
number of observations	645	605	-40

Table 15: Percentile ratios for the world distribution of income

	P90 /P10	**P90/P50**	**P10/P50**
2000	41.74	11.53	0.28
2005	76.08	10.50	0.14

However, regarding the percentile ratios of Table 15, it becomes evident that in 2000 the poorest person of the richest 10 % of world population had an income

being 41.7 times higher than the one of the richest person of the poorest 10 %. In 2005, the ratio grew even higher to a value of 76. Comparing the income of the poorest person of the richest 10 % with the medium-income (P90/P50), there is a slight decrease from 11.5 (2000) to 10.5 (2005). The richest person of the poorest 10 % earned 0.28 times less that of persons in the middle of the distribution. This value decreased to a ratio of 0.14 in 2005[35]. In summary, it can be said that the highest increase was observed between the top and the bottom of the distribution. Contrarily, the difference between the highest and the middle incomes, as well as the difference between the lowest and the middle incomes decreased only slightly. From this, it cannot be answered if most changes took place at the bottom- or top end of the distribution.

Since percentile ratios are relatively insensitive to outliers, and since they cannot depict changes happening at the very bottom or very top of the distribution, other inequality statistics will be reckoned additionally.

The world's Gini coefficient was 71.115 in 2000, and slightly lower in 2005 by 71.087 (Table 16). This small difference may express the decrease presumed by the kernel function (see Figures 5.1 and 5.2). Nonetheless, there should not be laid too much emphasis on this finding of a decrease, as the rounded Gini accounts for 71.1 for both years. Measured by the Theil index, there likewise was a marginal decrease of about -1.2 Theil points. The results changed from 102.5 in 2000 to 101.4 in 2005. Solely the MLD measured values show an obvious increase of about 16 MLD points starting from 108.4 and rising to 124.1 in 2005 (see Table 16). As already seen from the P90/P10 ratio, a good deal of changes took place at both ends of the distribution, and as the MLD is very sensitive to changes at the bottom (OECD 1997:31), it possibly reacted by showing an increase which the other two measures weren't sensitive enough to notice (Table 16).

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[35] As the calculated amounts are minute, figures are not roundet here.

Table 16: World Inequality: 2000 and 2005

	mean income ($PPP 2005 prices)	Standard-deviation	Gini	Theil	MLD
2000	4514	7327	0.711	1.025	1.084
2005	5435	8644	0.711	1.014	1.241
Change	+920		0	-0.012	+0.157

Remarkable about the results is however that global income inequality apparently has reached a very high level by the first half of the decade. Regardless whether increase or decrease of inequality is observed between 2000 and 2005, equally high levels of inequality are being expressed by all inequality measures used.

6.2 Decomposition of world inequality indices

The decomposition of the inequality measures used for 2000 and 2005 illustrates considerable changes (see Table 17). From the decomposition data, it can be observed that whereas the within-country component of all three measures gains, it detracts from the between-country inequality at the same time. It can also be stated that the within-components, measured by the Theil index and the MLD, lay respectively above those measured by the Gini coefficient (Table 17). As homogeneity within the regions is being completely ignored, likewise here the within-country inequality is presumably overestimated by the two Generalized Entropy measures. Within groups of people whose incomes overlap, there is no inequality. Therefore, one cannot measure inequality where no inequality exists. When there are three characteristics of one phenomenon (in this case within-country inequality, between-country inequality and the overlapping part), it is inadequate to divide the phenomenon just into two characteristics and define it solely by these.

Table 17: World Inequality Decomposition, 2000 and 2005

	2000	in percent	2005	in percent	change	change in percent
Gini	**0711**	**100**	**0.711**	**100**	**0**	
within	0.06	8	0,077	11	+0.017	+3
between	0.53	75	0.46	65	-0.07	-10
overlapping	0.119	17	0.166	23	+0.047	+6
Theil	**1.025**	**100**	**1.014**	**100**	**-0.012**	
within	0.408	40	0.406	40	-0.002	0
between	0.617	60	0.607	60	-0.01	0
MLD	**1.084**	**100**	**1.241**	**100**	**+0.157**	
within	0.589	54	0.720	58	+0.131	+4
between	0.495	46	0.520	42	+0.025	-4

Not only Dagum, who suggested a "New Approach" to Gini decomposition (1997), is convinced that the Gini decomposition is the superior measure. Comparing disintegration of different measures by own tests, Mussard, Seyte and Terraza, also give preference to the Gini decomposition: "(…) we incite to privilege the Gini decomposition in particular because it is built on a better between-group specification" (Mussard/Seyte/Terraza 2003: 5). At a first glance, the "New Approach to the Decomposition of the Gini" seems to be a new way that is differing from the Pyatt-type decomposition. Griffiths examined the two decomposition types and ascertains beyond doubt: "The new approach to decomposing the Gini coefficient proposed by Dagum (1997) for measuring inequality contributors from between and within subpopulations yields a decomposition that is identical to the traditional decomposition which is commonly applied in the literature" (Griffiths 2008: 7).

In the following paragraphs, two of the hypotheses formulated shall be correlated to the results from the decomposition data presented in Table 17.

Although the present analysis shows an increasing within-country inequality in 2000 and 2005, the within-component of the world's income inequality measured by the Gini coefficient is still much smaller compared to that one of the other two

measures. The overlapping-component becomes an increasingly important issue, indicating more homogeneity in peoples' income situations in 2005 than in 2000 (Table 17). The increasing importance of the overlap-component aligns with the measured result of slightly decreasing world income inequality. Though, this decrease is unincisive. As an explanation might serve that especially in the middle share of the distribution, people's incomes did overlap more in 2005 than in 2000.

Deduced from the results of the Gini decomposition (Table 17), there are admittedly more people overlapping in the middle, but this increase of homogeneity could not find expression in large sinking of total inequality since on both ends of the distributions, large changes were indicated by the P90/P10 ratio. Also huge changes in minimum and maximum incomes point to that direction. The tremendous increase of about +179 % in maximum incomes in Africa (Table 11.2) (mainly triggered by the Seychelles) may serve as an example, as well as the huge decrease in Asian minimum incomes of -87 %.: Except for the data produced by the MLD, it also can be deduced that total income inequality in 2000 as well as in 2005 is still driven by the between-country inequality, as its values are higher than the ones of the within-component. Consequently, concerning all inequality indices used, H3 (saying that: "The within-country inequality is smaller than the between-country inequality, both measured by the Gini coefficient or by the Generalized Entropy Indices") can only partly account. The higher within- than between-components measured by the MLD index can be attributed to the overestimation of the within-component due to the ignored overlapping-component.

But for all of those indices (Table 17), it can be concluded that the within-component is increasing while the between-component declines (H4: "The within-country component of world total inequality rises between 2000 and 2005"). The rising within- and overlapping-component, as well as the declining between-country inequality of the Gini coefficient do change in percentage in the given order (within-, between-, overlap-component) 8:75:17 (in percent) in 2000 versus 11:65:23 in 2005 (Table 17). Contrary to that, the Theil index, also with higher within-

components than the Gini coefficient, shows ratios of 40:60 (within-, between-component) for both years. The MLD shows ratios of 54:46 (within-, between-component) in 2000 and 58:42 in 2005, again with very high and increasing within- and decreasing between-components (Table 17).

Concerning hypotheses H4 it can be concluded that the data are nearly perfectly consistent with the assumptions. The increase of the within-component as presumed in H4 was also being exposed by Sala-i-Martin who presented a decline of the between-component of the MLD of about 25 %, and 15 % of the between-component measured by the Theil Index. This is a large change for a twenty year period starting in 1979 (Sala-i-Martin 2006: 391). For the within-country inequality, he declares an increase of about 23 % measured by the MLD, and 8 % measured by the Theil index between 1979 and 2000 (Sala-i-Martin 2006: 391).

Sala-i-Martin got lower within- but higher between-components being 36:64 (within:between in percent) (Table 18). Also the MLD shows slightly higher within-components than the ones by Sala-i-Martin. Here 54 % of total inequality is due to within-; 46 % due to between-country inequality. In contrary, Sala-i-Martin's data only attribute 40 % of inequality to the within-, and 60 % to the between-component of overall inequality.

Table 18: Decomposition of Theil and MLD for 2000 – Comparison of own Calculations with Results by Sala-i-Martin (2006)

	Theil	within	between	MLD	within	between
2000						
own calculations	1.025	0.408 (39.8))	0.617 (60.2)	1.084	0.589 (54.3)	0.495 (45.7)
Calculations Sala-i-Martin	0.783	0.284 (36.2)	0.499 (63.8)	0.820	0.319 (38.9)	0.501 (61.1)
deviation of results	+0.242	+0.124 (+3.6)	+0.118 (-3.6)	+0.264	+0.270 (+15.4)	-0.006 (-15.4)

Regarding hypothesis H4, all the data show the growing importance of the within-component in 2005 compared to 2000. For a visual illustration see Figure 6.

Viewed together with the same finding exposed by Sala-i-Martin, it is to presume that the idea of a big reverse might depict a future in which intra-country inequality plays a similar or even more important role in total inequality than before.
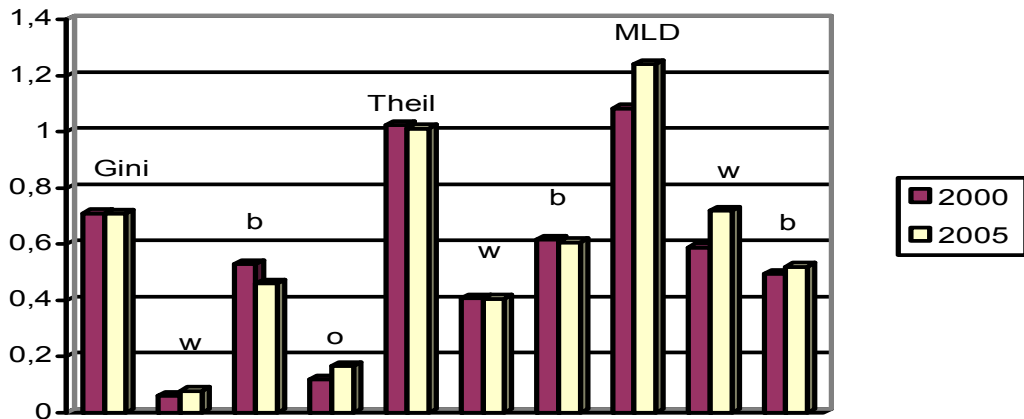
Figure 6: World inequality – Decomposition of the Gini coefficient, Theil index and Mean Logarithmic Deviation

w = within-country inequality; b = between-country inequality; o = overlapping-component

6.3 The development of world poverty rates

The poverty rates for all four measured poverty lines did show a decline of world poverty between 2000 and 2005 (Table 19). There are 13 % less people in 2005 living under $ 1.25 a day than in 2000. The percentage of people with incomes below $ 1.875 decreased by about 15 %, under $ 2.5 per day by about 19 % while, simultaneously, the number of citizens with less than $ 3.75 declined by 16 % (see Table 19).

Table 19: World population share living under various poverty lines in 2000 and 2005

	2000 in millions	in percent of total population	2005 in millions	in percent of total population	change

		in sample 2000		in sample 2005	
less than $ 1.25/day or $ 456/year	1.497	26	786	13	-13
less than $ 1.875/day or $ 684/year	2.069	36	1.235	21	-15
less than $ 2.5/day or $ 913/year	2.802	49	1.778	30	-19
less than $ 3.75/day or $ 1369/year	3.428	61	2.686	45	-16

Figure 7 illustrates the decline in poverty between 2000 and 2005 visually. The rates of the extreme poverty (less than $ 1.25) nearly bisects during this five year period (Table 19 and Figure 7). In 2005, only 21 % of world population has to get by with less than $ 1.875 compared to 2000 with 36 % of world population. While in 2000 still half the world's population live below the $ 2.5 poverty line, in 2005 there were only 30 % remaining. Finally, taking the last poverty line of less than $ 3.75/day as a basis, 61 % of world citizens were suffering poverty in 2000, whereas in 2005 the number declined to 45 % (Table 19 and Figure 7). The Millennium Goals of the United Nations intend having reduced poverty by half in 2015[36]. Reaching this goal would mean that still 5 % of the world's population would be living below the extreme poverty line (less than $ 1.25 a day). But although being well on the track, there is still quite a way to go.

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[36] See Sources: United Nations: Millennium Goals.
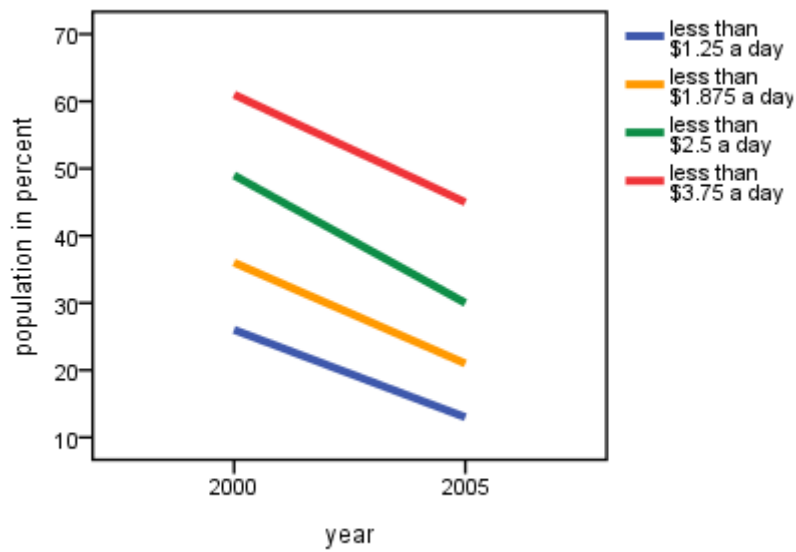
Figure 7: World – Development of poverty rates between 2000 and 2005

6.4 Determinants of world inequality

From the foregoing proposed considerations, the question arises which influences actually contributed to those high levels of inequality and its development during the examined time period? The findings of overall world inequality will be illustrated and explained by referring to the results of regional inequality (see Section 5). The world population during the two examined years is comprised as follows: 9 % of world's population in 2000 is represented by people inhabiting LAC, 5 % by those of Middle East, 7 % by FSU, 13 % by WENAO, 12 % by Africa and 54 % by those of Asia (see Figure. 8.1). Although, in total there is a growth of the world's population (there are 321 million more people in 2005 compared to 2000) a slightly different pattern emerges in 2005 (see Figure 8.2).
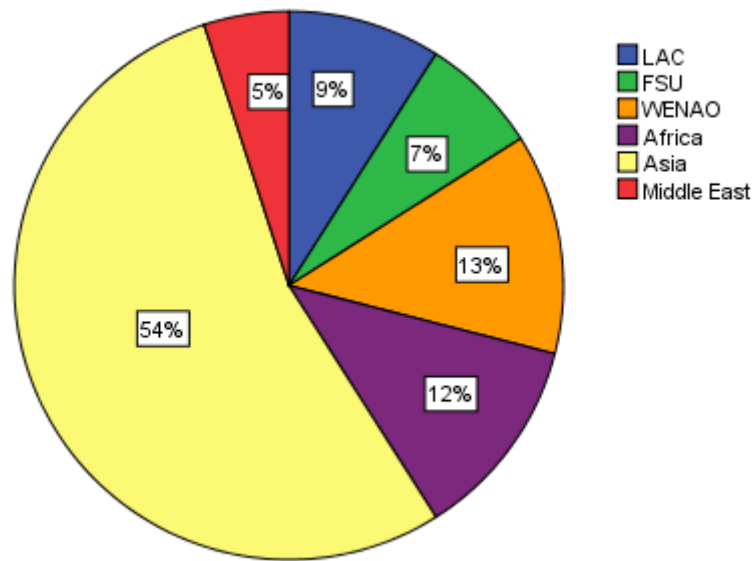
Figure 8.1: Regional population share on world population 2000
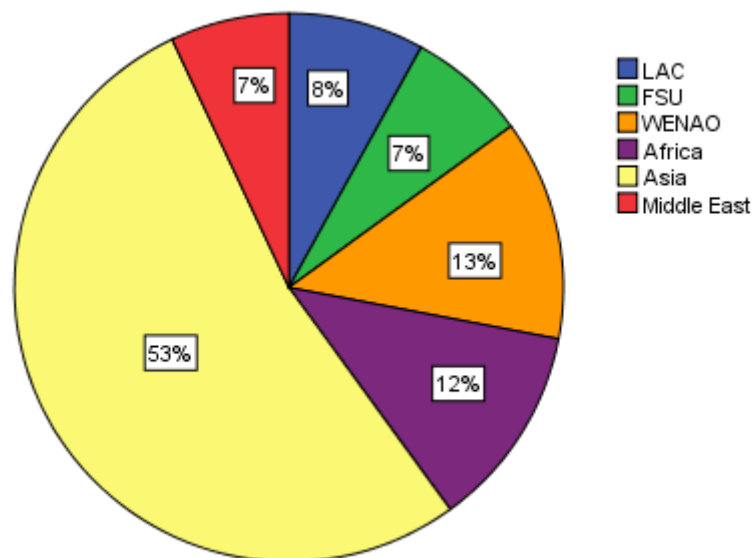
Figure 8.2:   Regional population share on world population 2005

Regarding the sample, the shares of FSU, Africa, and WENAO still account for 7 %, 12 %, and 13 % of world's population in 2005, while the population of LAC declined to 8 %. Asia contributed to the world's population by one percent less than in 2000 being about 53 % in 2005 (Table 20).

Table 20: Population by region in 2000 and 2005 compared to world's population

	2000 in millions of people (in percent)	2005 in millions of people (in percent)	change in percent
LAC	490 (9 %)	477 (8 %)	-1
Eastern Europe and FSU	379 (7 %)	388 (7 %)	-0.2
WENAO	726 (13 %)	754 (13 %)	-0.2
Africa	660 (12 %)	744 (12 %)	+0.8
Asia	3,105 (55 %)	3,222 (54 %)	-1
Middle East	299 (5 %)	395 (7 %)	+2
World	5,661 (100 %)	5,982 (100 %)	

The shares of the world's population covered by different regional population shares as well as the income shares on the total world incomes in 2000 and 2005 differ in size (see Figures 8.3 and 8.4).
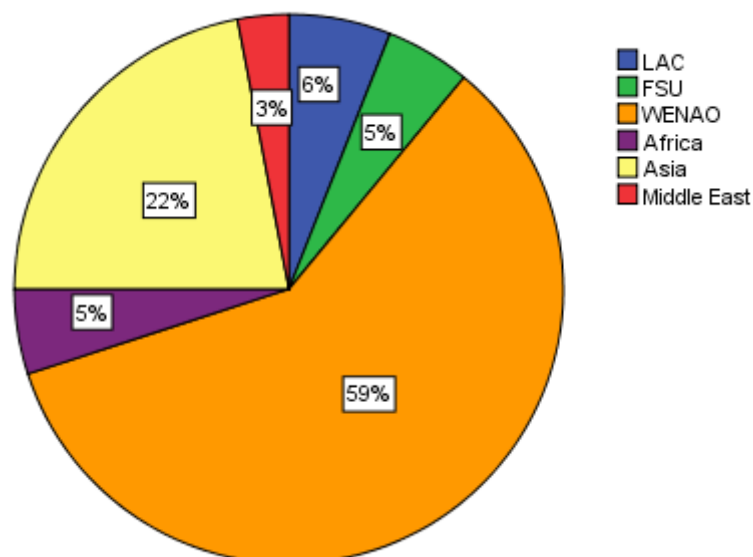
Figure 8.3: **Regional income share on total world income in 2000**
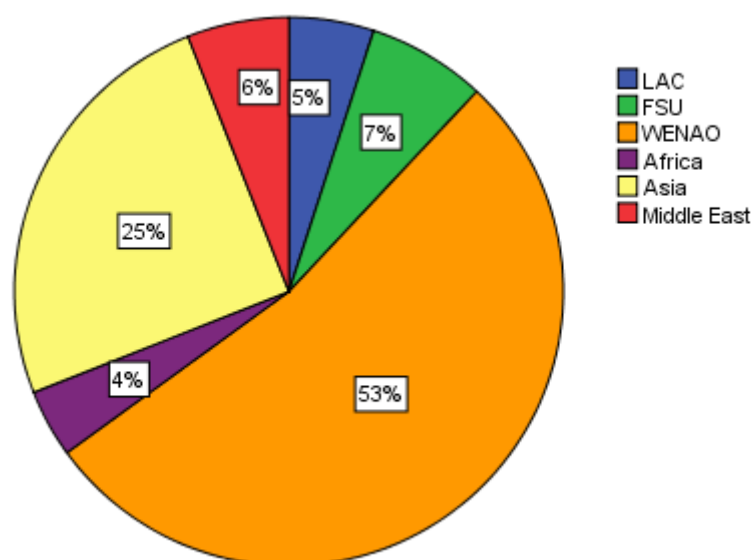
Figure 8.4: Regional income share on total world income in 2005

While Middle East in 2000 holds an income share of merely 3 %, in 2005 this share has doubled to 6 % of total world income (Figures 8.3 and 8.4). In 2005, FSU has an income share of about 7 %, being 2 % higher than in 2000. Africa's income share on total world income is about 1 % lower than it was in 2000. While Asia increased its income share by about 3 % to 25 % of total world income in 2005, WENAO lost about 6 % of it in 2005 compared to 2000 (Figures 8.3 and 8.4). The income figures in Table 21 give an idea of the income level in 2000 and 2005:

Table 21: Income by region compared to world in 2000 and 2005

	2000 $ PPP (in 2005 prices) in milliards[37]	2005 $ PPP (in 2005 prices) in milliards	change in percent
LAC	1,134 (5.5 %)	1,463 (5.4 %)	-0.1
Eastern Europe and FSU	952 (4.5 %)	1,758 (6.5 %)	+2
WENAO	12,355 (59.2 %)	14,296 (53.1 %)	-6.1
Africa	939 (4.5 %)	964 (3.6 %)	-0.9
Asia	4,650	6,814	+3

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[37] The expression "Milliards" defines 10^9 and is used in order to avoid confusion with "Billions" (10^{12}).

	(22.3 %)	(25.3 %)	
Middle East	683 (3.3 %)	1,621 (6.0 %)	+2.7
WORLD	20,716 (100)	26,918 (100)	

Every individual regional income in 2005 is higher than in 2000, even if the regional share on total world income may have changed. Total world income increased by about 30 % in this five year period (not to be confused with the growth of world mean income of 22 % on average). Adherent to the regional division, one could say that 8.6 % of the world's population (LAC) only contribute 5.4 % to total world income in 2000; 6.7 % (FSU) raise 4.5 %; 12.8 % (WENAO) 59.1 %; 11.6 % (Africa) contribute 4.5 %, and Middle East equivalent to 5.2 % of world population raises 3.2 % of world income. The region Asia, representing more than half of the world's population (54 %) only holds 22.3 % of total world income in 2000. For 2005, 7.9 % of the world's population (LAC) contribute 5.4 % to the world income; 7.0 % (FSU) generate 6.5 %; 12.6 % (WENAO) raise 53 % and 6.6 % (Middle East) hold 6 % of the world's income while Asia, representing 55 % of the world's population, only contributes 25 % to the world income of 2005 (Table 21). Especially from the examples of WENAO and Asia the unequal distribution of world income and world population leaps to the eye.

Mean- and median income by region compared to world in 2000 and 2005 ($ PPP in 2005 prices)
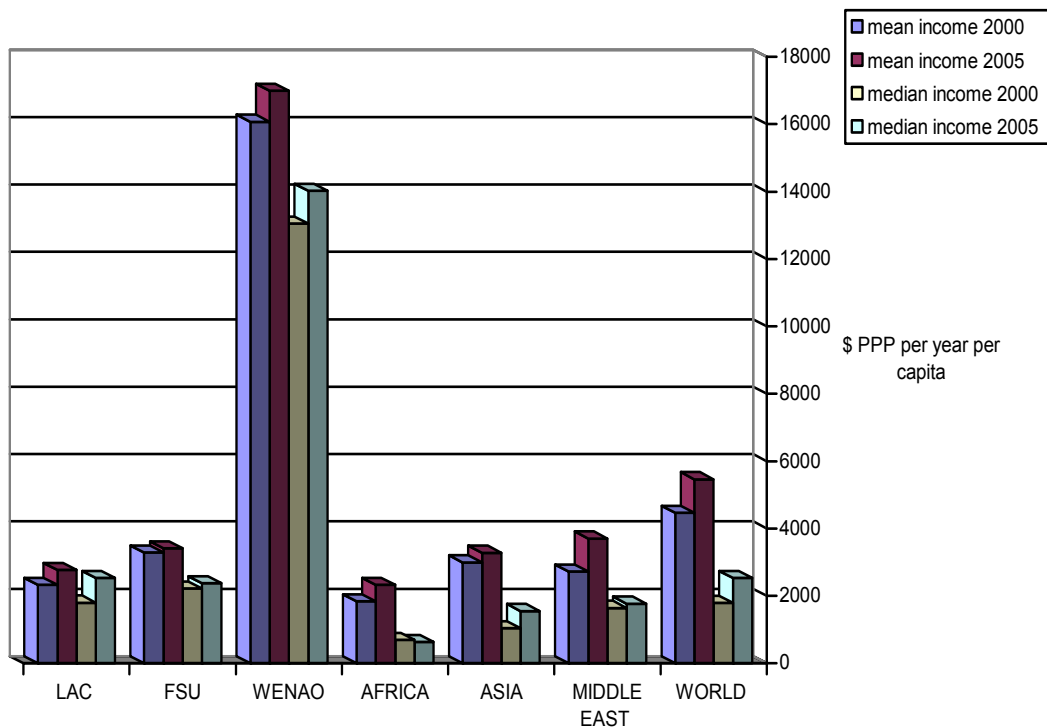
Figure 9: Regional mean- and median income compared to world mean-and median income in 2000 and 2005

To see a pattern of increasing world income inequality caused by differences between two compared regions or countries, the average difference in mean incomes between these entities would have to exceed the level of the average growth of world mean income between the two years compared. This was underlined by Milanovic saying that "(...) it is not sufficient that a rich country grows faster than a poor country" (Milanovic 2002a: 85). Instead, "(...) the absolute difference between the two countries' incomes must increase faster than world mean income" (Milanovic 2002a: 85).

As already stated above, world mean income between 2000 and 2005 increased by about 22 percent on average. Comparing the average growths' of the richest big region (WENAO) (Table 11.1) and that of the poorest and biggest regions (Africa and Asia) (Tables 11.2 and 11.4) the difference in mean income growth between regions WENAO and Africa rises by 3.0 %, while the interregional difference of WENAO and

Asia increases by 4.8 % between 2000 and 2005. Both growth rates of differences stay below the growth of world mean income of 22 %. Concerning population numbers, this inter-regional example serves well as to explain why percentile ratios (P90/P10) could almost double without having a large increasing effect on total world income inequality.

If individual countries are considered, namely the biggest contributors[38] to the between-country inequality, there is USA on one side, and China Rural, India Rural, Bangladesh and Nigeria on the other. Calculating the growth of the differences in the mean incomes of some country pairs, the gap between USA and China Rural increased by 8.5 %; that between USA and Bangladesh by 9.7 %. The difference in mean incomes between USA and Nigeria grew by 9.5 %, whereas the income difference between USA and India Rural increased by 3.6 %.

Neither in the comparison of the regions, nor in the comparison of individual countries were the observed average differences of mean incomes exceeding the average growth of world mean income of 22 %. Therefore, the inequality measures (Theil index/Gini coefficient) need to show either declining or unchanged results. In the present analysis the outcome of Theil index and Gini coefficient shows a hardly mentionable decrease. Opposed to the assumption, world inequality measured by the bottom-sensitive MLD increased a little indicating that there were great changes in the bottom- end of the distribution.

The development of differences between specific countries or regions, do not exceed the average growth of world mean income – therefore income inequality could not ascend. In order to explain the elevated level and curve of slightly decreasing of inequality (as indicated by Gini and Theil) between 2000 and 2005, the within-country differences of India and China, with regard of rural- and urban areas and their enormous size of population, had to be taken into consideration.

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[38] For the biggest contributors of income inequality see Section 6.5, pp. 72-76.

The difference between China's rural- and China's urban income (rural income: 579 $ PPP / urban income: 1679 $ PPP per year and capita) was $ PPP 1099 in 2000. In 2005 the incomes are 796 $ PPP (rural) and 2568 (urban), yielding a difference of $ PPP 1771. The growth rate of the differences between 2000 and 2005 corresponds to +61 %. In India, the differences between rural- and urban parts have considerably increased in 2005 being 5.5 times higher than in 2000. Growth rates of the urban-rural-differences are definitely higher than the average growth of the world mean income of 22 %. This increase of income differences was well reflected by the P90/P10 ratio which almost doubled between the two examined years. The MLD is sensitive to changes at the bottom of the distribution (OECD 1997: 31). As changes mainly took place at the bottom of the distribution, the MLD probably shows increasing inequality due to the growth of differences between urban- and rural incomes, while the upper-sensitive Theil index with slightly negative values still aligns with the Gini coefficient (sensitive to changes in the middle of the distribution) in slightly decreasing inequality (Table 16).

6.5   The "List of the Seven" – The biggest contributors to overall inequality

Tables 22.1(a-b) and 22.2 (a-b) (outer right row) show the seven biggest contributors to the between-(a) and the within-income inequality (b) in 2000 and 2005. At first glance, especially Asian countries augment total inequality. Furthermore the United States appear in every `List of the Seven`. Regarding the above explained reasons stating why the Gini decomposition is considered to be the more precise decomposition means (Section 6.2, page 60), forthgoing the focus will be laid particularly on its decomposition data.

As already shown in Table 17, in 2000 the overall Gini coefficient of 71 was being decomposed into 53 Gini points representing the between-country inequality (75 % of total inequality), 6 Gini points corresponding to the within-component (8 %), and 12 to the overlap-component (17 %). In total, the seven countries in Table 22.1a make up a value of 48 Gini points and therefore explain 90 % of the total between-

country inequality (53 Gini point) in 2000. China Rural with its value of 20 Gini points explains 38 % of the overall between-component in 2000, followed by India Rural with a value of 16 contributing to 31 % of the total between-component. The rural counterparts of China and India are instantly followed by the urban ones, making up 12 % (China Urban) and 5 % (India Urban) of the between-component. Indonesia, United States, and Nigeria only reach values between 0.9 % and 2.6 % on the total between-inequality.

On the contrary, the much lower within-component of 6 Gini points (Table 22.1b outer right row), equivalent 8 % of total inequality in 2000, is mostly driven by the United States with a value of about 3 Gini points constituting 49 % of the total within-part (6 Gini points). Rural China and India stand for 10 and 8 percent of total within-inequality, while urban China and urban India show only 4- and 2 % respectively. Both, Indonesia and Nigeria, make up less than 1.5 % of the total within-component in 2000.

Table 22.1: The "List of the Seven" for 2000

Table 22.1a: The seven biggest contributors to the between-component in 2000

between-component									
Region	Country	Year	Population total	Population Share On Total Pop World	In Percent	Population per quintile	Gini	Pyatt *between-* component	in percent of total between-component *(53)*
Africa	Nigeria	2000	123,688,536	0.021846	2 %	24,737,707	0.41	0.477	0.898
WENAO	United States	2000	282,172,000	0.049836	5 %	56,434,400	0.37	0.936	1.760
Asia	Indonesia	2000	213,395,411	0.037689	4 %	42,679,082	0.32	1.389	2.611
Asia	India Urban	2000	294,617,670	0.052035	5 %	58,923,534	0.32	2.683	5.044
Asia	China Urban	2001	454,552,200	0.080282	8 %	90,910,440	0.24	6.156	11.571
Asia	India Rural	2000	721,305,330	0.127395	13 %	144,261,066	0.24	16.250	30.540
Asia	China Rural	2001	808,092,800	0.142723	14 %	161,618,560	0.30	20.248	38.054
								total: 48.144	total: 90.479

Table 22.1b: The seven biggest contributors to the within-component in 2000

within-component									
Region	Country	Year	Population total	Population Share On Total Pop World	In Percent	Pop_quintil	Gini	Pyatt *within-* component	in percent of total within-component *(6)*
Africa	Nigeria	2000	123,688,536	0.021846	2 %	24,737,707	0.41	0.012	0.214

Asia	Indonesia	2000	213,395,411	0.037689	4 %	42,679,082	0.32	0.082	1.372
Asia	India Urban	2000	294,617,670	0.052035	5 %	58,923,534	0.32	0.100	1.672
Asia	India Rural	2000	721,305,330	0.127395	13 %	144,261,066	0.24	0.256	4.274
Asia	China Urban	2000	454,552,200	0.080282	8 %	90,910,440	0.24	0.457	7.623
Asia	China Rural	2000	808,092,800	0.142723	14 %	161,618,560	0.30	0.623	10.387
WENAO	United States	2000	282,172,000	0.049836	5 %	56,434,400	0.37	2.928	48.774
								total: 4.462176	total: 74.320

Table 22.2: The "List of the Seven" for 2005

Table 22.2a: The seven biggest contributors to the between-component in 2005

between-component									
Region	Country	Year	Population total	Population Share On Total Pop World	In Percent	Pop_quintil	Gini	Pyatt *between*-component	in percent of total between-component (46)
WENAO	Brazil	2005	185,986,964	0.03108652	3 %	37,197,392	0.51	0.810	1.733
Asia	United States	2005	295,753,000	0.04943320	5 %	59,150,600	0.43	0.962	2.059
Asia	Indonesia	2005	227,303,175	0.03799226	4 %	45,460,635	0.31	1.269	2.715
Asia	India Urban	2005	317,429,070	0.05305622	5 %	63,485,814	0.43	2.357	5.043
Asia	China Urban	2005	521,488,000	0.08716335	9 %	104,297,600	0.32	6.507	13.923
Asia	India Rural	2005	777,153,930	0.12989626	13 %	155,430,786	0.42	14.966	32.019
Asia	China Rural	2005	782,232,000	0.13074503	13 %	156,446,400	0.35	15.456	33.068
								total: 42.327	total: 90.559

Table 22.2b: The seven biggest contributors to the within-component in 2005

within-component									
Region	Country	Year	Population total	Population Share On Total Pop World	In Percent	Pop_quintil	Gini	Pyatt *within*-component	in percent of total within-component (7.7)
Asia	Japan	2005	127,773,000	0.02135643	2 %	25,554,600	0.27	0.189	2.442
LAC	Brazil	2005	185,986,964	0.03108652	3 %	37,197,392	0.51	0.216	2.791
Asia	India Urban	2005	317,429,070	0.05305622	5 %	63,485,814	0.43	0.534	6.911
Asia	China Rural	2005	782,232,000	0.13074503	13 %	156,446,400	0.35	0.641	8.289
Asia	China Urban	2005	521,488,000	0.08716335	9 %	104,297,600	0.32	0.839	10.858
Asia	India Rural	2005	777,153,930	0.12989626	13 %	155,430,786	0.42	1.368	17.701
WENAO	United States	2005	295,753,000	0.04943320	5 %	59,150,600	0.43	2.794	36.147
								total: 6.581	total: 85.138

In 2005, the total Gini of 71.1 was decomposed into 7.7 points due to within-, 46 due to between-country inequality and 16.6 due to overlaps (Table 17). For the 2005 within-component (Table 22.2b, outer right row), there is a similar picture concerning the United States, again being the largest contributor to the total within-country inequality of 11 Gini points. Here, the country is responsible for only 36 % of the total share, reflecting a large decrease of about 12 %. Compared to 2000, the within-component of India's rural part in 2005 is bigger than that of China Rural. Surprisingly, the within-country inequality produced by China Urban in 2005 is bigger than that of China Rural. On the other hand, for 2000, China Rural's influence is bigger than that of China Urban. Instead of Indonesia and Nigeria, for 2005, Brazil and Japan are found at the end of the list with increased within-component parts ranging between 2.8 and 2.4 percent.

The seven countries adding most to the between-country inequality (Table 22.2a) can likewise for 2005 explain 90 % of the total between-inequality by making up 42, out of total 46 Gini points. Again, the rural parts of China and India are the largest contributors to the between-component, followed by their urban counterparts. Being in alignment with the presumption of a decrease of the between-component, in total, there appear lower values in 2005 than in 2000. These findings, combined with the exceeding within-values for 2005, reflect the higher importance of the within-component on total inequality in 2005 compared to 2000.

Therefore, in affirmation with the foregoing presumptions it can be summarized that the differences between very densely populated countries that are either very rich or very poor contribute most to world income inequality.

Hence, also the individual countries being responsible for these differences can be named. By dismissing them from the analysis, dramatically lower values of the three inequality measures should appear. By filtering out these countries individually or in combination, the results give prove to the above stated presumption as follows:

Excluding the United States in 2000 on the one hand, and Nigeria, China Urban, China Rural, India Urban, India Rural, Indonesia and Bangladesh on the other, the

Gini coefficient reaches a value of merely 64, a Theil index of 88 and a MLD of 107. These results are much lower than measured when including all countries. The Gini in this reduced sample is about 7 Gini points lower than measured before. Excluding only the big but poor countries while including the United States, the result shows a minimally elevated Gini compared to the foregoing test, but still remains at 64 Gini points, rounded. By excluding Nigeria only, there is a result being merely lower about 0.3 Gini points compared to the original Gini coefficient, reaching 70 points. In the full sample analysis the United States contribute to about 2 Gini points. Excluding this country by this test, results in a Gini of 69. Omitting India lowers the Gini of about 2 points. Surprisingly, China's exclusion only descends the result by 0.5 points. Excluding Indonesia and Bangladesh influences the output not mentionable. Filtering out all these countries of the 2005 sample, a Gini of only 62 emerges, being some 9 Gini points lower than the original Gini (71.1) from the full sample analysis. By abstracting the big poor countries while leaving the United States in the sample, the result is a Gini of 64 which contributes to a difference of 7 points. Nigeria's absence lowers the Gini by about 0.4 points while dismissing the United States still contributes to a 1.8 points difference. Nearly 5 points are due to India's exclusion whereas the influence of China again remains slightly below that of India, but now even constituting a 3.4 Gini points difference. Also here, compared to the other countries, the exclusion of Bangladesh and Indonesia does not show a dramatic influence on the result.

Remarkable is that India's influence catches up with China's.

Regarding the foregoing `List of the Seven`, China Rural still holds the top position in the range of the between-component. But India Rural's influence on the between-component rose between 2000 and 2005 from 30- to 32% while China Rural's influence declined from 38- to 33%. However, filtering out the two big Asian countries as whole entities, India's influence on the total inequality level is more pronounced than China's. While in 2000 and 2005, India's influence lowered the overall Gini by 2- respectively 5 Gini points, China's absence only lowered the coefficient by 0.5-, respectively 3.4 points. The result that China lowers the result less than India when they are excluded as whole countries as compared to their

rural- and urban parts is due to the higher differences between the urban- and rural parts of India compared to the differences between rural- and urban parts in China. Compared to the inequality of the full sample, suspending those countries always leads to less inequality. Above that, there is again a lower overall inequality in 2005 than in 2000.

6.6   Summary of Results: Global Inequality

World mean income was substantially higher in 2005 compared to 2000 being $ PPP 4,464 (2000) and $ PPP 5,465 (2005) equivalent to a 22 % increase. Median incomes being $ PPP 1,798 (2000) and $ PPP 2,531 (2005) rose by 41% and therefore highly exceed the growth of mean incomes. From the P90/P10 ratio, it was found that a good deal of changes took place at the ends of the distribution. In 2000, the poorest person of the richest 10 % of world population had an income being about 42 times higher than the income of the richest person of the poorest 10 %. The ratio even increased to 76 in 2005. Measured by the Gini coefficient and the Theil index, there is a slight decrease in income inequality between 2000 and 2005 while the MLD indicated an increase. The MLD which is sensitive to changes at the bottom of the distribution could make out an increase of income inequality which the other two measures were not sensitive enough to notice.

Likewise from the data about the global level, the decomposition results point towards an overstatement of the within-country inequality component by the two Generalized Entropy measures, especially by the MLD. The overlapping-component indicates more homogeneity in 2005 incomes than in 2000 ones. However, because of the large changes at the ends of the distribution, the growing overlapping-components could not express in large sinking inequality.

Except for the data by the MLD, it could be found that income inequality in 2000 as well as in 2005 is still driven by the between- country inequality, under the circumstance of a within-component that gains in importance.

Poverty rates for all four measured poverty lines did decline substantially between 2000 and 2005. For example, there are 13 % less people in 2005 living below $ 1.25 per day compared to 2000.

In total, global inequality appears at a very high level in the first half of the decade expressed by all inequality measures applied.

The differences between slow growth in China and India (especially their rural parts) compared to fast growth of rich OECD nations contribute most to the high levels of inequality. The between-country inequality is especially due to Asian countries of the world. The within-country inequality, on the other hand, is mainly driven by the United States.

7.   Comparison of own results with findings by Milanovic and Sala-i-Martin

The Theil and MLD decompositions are compared for 2000 as this is the only common year covered by this- as well as by Sala-i-Martin's analysis. In addition, the results for 2005 of the present analysis, as well as Sala-i-Martins results for 1988, 1993 and 1998 shall be reviewed as these last three years were examined by Milanovic as well. Considering these years, the findings by Sala-i-Martin are constantly lower than own- or results by Milanovic (see Table 23). Regarding the common year 2000, own calculations depict a Theil index 24 points higher and a MLD that is even 26 points above the indices of Sala-i-Martin (see Table 23). The Gini coefficient for 2000 is 7 points lower in his calculations (see Table 23). These results stay perfectly in line with hypothesis H1 "Global income inequality in 2000 and 2005 will show inequality indices that are higher than the results measured by Sala-i-Martin and will not correspond to his declining trend of global income inequality."

Table 23: Gini and Theil indices of world income inequality measured by Sala-i-Martin compared to own results

	1988 (Sala-i-Martin)	1993 (Sala-i-Martin)	1998 (Sala-i-Martin)	2000 (Sala-i-Martin)	2000 own calculations	2005 own calculations
Gini	64.9	64.0	63.8	63.7	71.1	71.1
Theil	80.8	78.7	78.5	78.3	102.5	101.3

| MLD | 84.2 | 81.9 | 81.6 | 82.0 | 108.4 | 124.1 |

Source: own calculations for 2000 and 2005. 1988, 1993, 1998 and 200 by Sala-i-Martin (2006): The World Distribution of Income: Falling Poverty and … Convergence, Period*, p. 384. The Quaterly Journal of Economics, Vol. CXXI, Issue 2, May 2006.

Though likewise showing much lower inequality indices in total, poverty rates measured by Sala-i-Martin appear to be dramatically underestimated (see Table 24). As already stated Sala-i-Martin used old PPP-rates of 1993 prices. His poverty line definitions therefore differ from those used here. Sala-i-Martin constantly applies lower borders for all four lines than the present analysis. Nevertheless, under all poverty lines he gets population numbers being lower than those calculated here. This supports hypothesis H5 "Poverty rates show lower values for 2005 than for 2000, and are higher than the rates presented by Sala-i-Martin for 2000".

Table 24: World population share living under various poverty lines in 2000: Comparison of own results with findings of Sala-i-Martin

	2000 in millions (own calculations)	**in percent of total population in sample 2000**	**2000 in millions (calculations by Sala-i-Martin)**	**in percent of total population in sample 2000**	**deviation**
less than $1,25/day or $456/year	1,497	26	321	6	27
less than $1,875/day or $684/year	2,069	36	398	7	29
less than $2,5/day or $913/year	2,802	49	600	11	38
less than $3,75/day or $1369/year	3,428	61	1,197	21	40

Source: Sala i-Martin 2006:374 and own calculations.

Based on this issue, it is not surprising that he concludes: "The world might just be in a better shape than many of our leaders believe" (Sala-i-Martin 2006: 393).

To determine whether the findings of the foregoing investigation are in line with the ones of Sala-i-Martin's opponent, Milanovic's indices shall be considered. From the comparison, it can be stated that the actual results of 2000 and 2005 align perfectly with his results for the time period between 1988 till 2002. In 1988 a Gini coefficient of 68.4 was found. It rose to 69.9 in 1993, then slightly decreased to 69.4 in 1998. In 2000 it reached 71.1, declined a little reaching 70.8 in 2002 and finally ended up reaching again 71.1 points in 2005 (see Table 25 and Figure 10).

Table 25: Gini Coefficients 1988 until 2005- A seventy years period of global inequality by merging up results with Milanovic

	1988 (Milanovic)	1993 (Milanovic)	1998 (Milanovic)	2000	2002 (Milanovic)	2005
Gini Coefficient	68.4	69.9	69.4	71.1	70.8	71.1

Source: own calculations for 2000 and 2005. 1988, 1993, 1998 and 2002 by Milanovic (2009): Global Inequality Recalculated: The Effect of New 2005 PPP Estimates on Global Inequality, p. 13. Policy Research Working Paper 5061, The World Bank Development Research Group- Poverty and Inequality Team, September 2009.

Based on these findings, the last remaining hypothesis H2 also cannot be abandoned: "Global income inequality in 2000 and 2005 is higher than measured by Milanovic in 1988, 1993 and 1998".
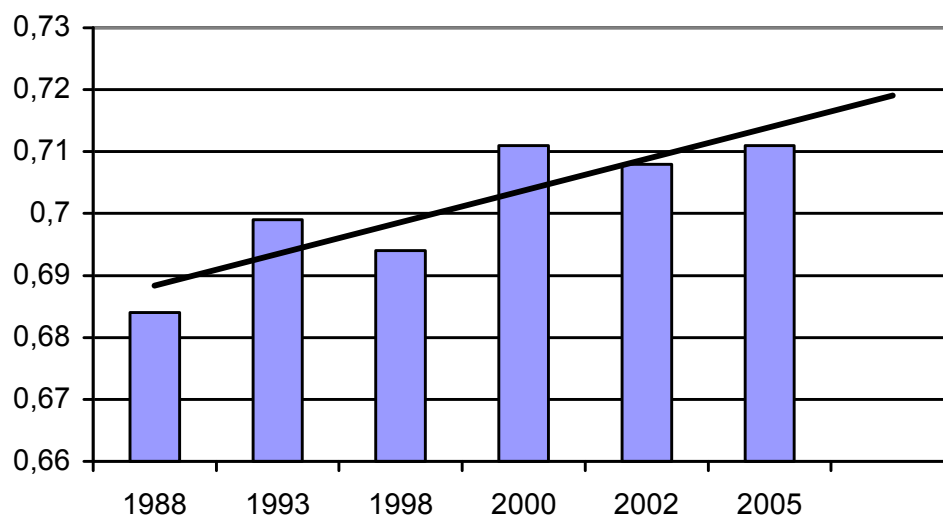
Figure 10: World Gini coefficient 1988-2005

In a 2006 paper, a zig-zag development of income inequality is presumed instead of a trend (Milanovic 2006: 15). Though, besides some zig-zag-shaped increases and declines of world income inequality, the trend line in the following Figure 10 indicates a trend of slightly increasing inequality during the 17 years covered by the data. However, the results are clearly conflicting a process of *convergence.*

8.   Summary and conclusions

From the calculations of world income distribution for 2000 and 2005, both covering 93 % of world population, the following conclusions can be summarized:

1. World income inequality appears at a very high level: the rounded Gini coefficient is 71,1 for both examined years measured by incomes adjusted for differences in countries' Purchasing Power Parity in 2005 PPP-prices.
2. World income inequality declined scarcely noticeable by -0.028 Gini points. The Theil index that is however sensitive to changes in the upper-end of the distribution showed a likewise marginal decline of -0.012 Theil points. Only the bottom-sensitive Mean Logarithmic Deviation noticed a small increase of about 1.5 MLD points.

3. World mean- and median incomes did increase between 2000 and 2005 by 22-, respectively 41 %.

4. Nonetheless it can be stated that the spread of the distribution did increase: while in 2000 the poorest person of the richest 10 % had an income that was about 42 times higher than that of the richest person of the poorest 10 % of the distribution, this value did almost double reaching 76 in 2005. This finding is also supported by the high increase of maximum incomes.

5. In order to determine how inequality is constituted, inequality decomposition was undertaken. It has been detected that the Gini decomposition is more suitable than the decomposition of the Generalized Entropy Indices to describe inequalities of income distributions. The reason is severe over-emphasis of the within-country inequality while the part in which people's incomes do overlap is missing completely. Generalized Entropy Indices Theil and MLD simply measure inequality where there is equity.

6. The major finding from the inequality decomposition was that overall inequality is still driven by the between-country inequality, but the within-country component gains in importance measured by all three applied inequality indices. On average, the proportion between the within- and the between-component of the Theil index on total inequality is 40:60, while the MLD shows an even higher within-component of 56:44 in percent. In contrast, the values of the Gini decomposition are much smoother concerning the within-component. On average, the proportional result was 9.5 % (within): 70 % (between-): 20 % (overlap-component).

7. Already Sala-i-Martin discovered the circumstance of declining between- and rising within-inequality. From own calculations, it is claimed that this is a trend continued to proceed till the first years of the third millennium.

8. Thereby, the biggest contributor to overall inequality is the growing difference between mean incomes in the world. That means in particular, the growing difference between rural- and urban mean incomes in big Asian countries, as well as the difference between these and the fast increasing

mean incomes in rich OECD nations. The growth of differences was well reflected by the growth of the P90/P10 ratio.

9. World poverty rates, defined as the population share living below a certain poverty line, significantly declined between 2000 and 2005. Hereby, the 2005 lines stochastically dominate the ones for 2000. While in 2000 26 % of world population still suffered from extreme poverty (below $ PPP 1.25 per capita per day), its share halved to reach 13 % in 2005. In WENAO (Western Europe, North America and Oceania), there were no observations of population shares living below any of the applied poverty lines. In all remaining regions, poverty lines continued to fall, except in LAC (Latin America and the Caribbean) and Africa. Asia successfully experienced the largest decline in poverty rates by about 29 % on average.

10. Moreover, it has been found out that poverty rates are much higher than predicted by Sala-i-Martin, who estimated the amount of people suffering from extreme poverty in 2000 to be 7 % (Sala-i-Martin 2006:392) a much lower value than the 26 % estimated by the present analysis.

11. Admittedly, neither of the reasons examined could explain Sala-i-Martin's declining inequality trend right down to the last detail, but the possible methodological reasons could be reduced to three. While his exclusion of a whole region (Former Soviet Union and Eastern Europe), the usage of GDP per capita, as well as the usage of quintile shares can be dismissed, the possible explanations remaining are the usage of old 1993- instead of new 2005- PPP rates and his allegedly large amount of approximated data for a time period of 30 years.

12. The level of world income inequality computed for 2000 is much higher than predicted by Sala-i-Martin. The respective results for the Gini coefficient in 2000 lie 7.4 points apart being 63.7 (Sala-i-Martin) and 71.1 (present calculation).

13. Together with the results by Milanovic, the data cover a 17 years period and therefore form a convincing time basis. Hence, the results from the

calculation of world income distribution allow the conclusion that, besides some zig-zag developments, an increasing inequality trend did exist, so far.

The findings of the present study reveal that the world is not in that "good shape" that some authors want to see her. Viewed in a timeline, the data support by no means a process of convergence, but instead show that the world is right in the thick of "*Divergence, Big Time*" (Pritchett 1997).

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9.   Appendix:

Data Sources 2000

			Data Sources 2000 Sample		
If data are not specified by survey name or web page (row: Source in detail) then data are taken unmodified from the UNU-WIDER Database (available at: http://www.wider.unu.edu/research/Database/en_GB/wiid/)				
Region	Country	Year	Source1	Source in detail	Annotations
LAC	Argentina	2000	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Permanente de Hogares	
	Belize	1999	World Bank Poverty Database	http://data.worldbank.org/country/	
	Bolivia	2000	Deininger & Squire, World Bank 2004	Encuesta Continua de Hogares - Condicionas de Vida (ECH)	
	Brazil	2001	Deininger & Squire, World Bank 2004	Pesquisa Nacional por Amostra de Domicilios (PNAD)	
	Chile	2000	World Bank	http://data.worldbank.org/country/	
	Colombia	2000	Deininger & Squire, World Bank 2004	Encuesta Nacional de Hogares-Fuerza de Trabajo (ENH)	
	Costa Rica	2000	Deininger & Squire, World Bank 2004	Encuesta Permanente de Hogares de Propositos Multiples (EHPM)	
	Dominican Republic	2000	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Nacional de Fuerza de Trabajo	
	Guatemala	2000	Deininger & Squire, World Bank 2004	Encuesta Nacional de Ingresos y Gastos Familiares (ENIGFAM)	
	Guyana	2000	World Bank, World Development Indicators 2004	http://data.worldbank.org/indicator	
	Haiti	2001	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Honduras	1999	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Permanente de Hogares de Propósitos Múltiples	
	Jamaica	2000	World Bank Poverty Monitoring Database 2002	Jamaica Survey of Living Conditions	Mean income for 2000 estimated through mean income of Jamaica in 2005 minus mean annual growth rate of a "neighbouring country" (in this case Venezuela between 2000 and 2005).
	Mexico	2000	Luxembourg Income Study	Encuesta nacional de ingresos y gastos de los hogares	
	Nicaragua	2001	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Nacional de Hogares sobre Medición de Nivel de Vida	
	Panama	2000	Deininger & Squire, World Bank 2004	Encuesta de Hogares (EH) - August	
	Paraguay	2001	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Permanente de Hogares	
	Peru	2000	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Nacional de Hogares	
	Uruguay	2000	Socio-Economic Database for Latin America and the Caribbean, 2006	Encuesta Continua de Hogares	
	Puerto Rico	1999	Paukert 1973	Weisskoff 1970	
	Chile	2000	Deininger & Squire, World Bank 2004	Encuesta Nacional del Empleo (ENE)	
	Ecuador	2000	World Bank	http://data.worldbank.org/country/	
	El Salvador	2000	World Bank	http://data.worldbank.org/country/	
	Suriname	1999	Paukert 1973	Adelman and Morris 1972	
	Venezuela	2000	World Bank	http://data.worldbank.org/country/	Mean income for 2000 estimated through mean income of Venezuela in 2005 minus mean annual growth rate of Venezuela between 2000 and 2005.
	Venezuela	2000	Deininger & Squire, World Bank 2004	Encuesta de Hogares por Muestreo(EHM)	
FSU	Azerbaijan	2000	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Belarus	2000	Transmonee 2004	Household Budget Survey	
	Belarus	2000	World Bank	http://data.worldbank.org/country/	
	Bulgaria	2000	Transmonee 2004	Household Budget Survey	
	Croatia	2000	World Bank	http://data.worldbank.org/country/	

	Czech Republic	2000	Transmonee 2004	Household Budget Survey	
	Estonia	2000	Transmonee 2004	Household Budget Survey	
	Georgia	2001	Transmonee 2004	Household Budget Survey	
	Hungary	2000	Transmonee 2004	Household Budget Survey	
	Kazakhstan	2001	World Bank Poverty Monitoring Database 2002	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Kyrgyz Republic	2000	World Bank	http://data.worldbank.org/country/	
	Latvia	2000	Transmonee 2004	Household Budget Survey	
	Lithuania	2001	Transmonee 2004	Household Budget Survey	
	Macedonia, FYR	2000	Transmonee 2004	Household Budget Survey	
	Moldova	2000	World Bank	http://data.worldbank.org/country/	
	Poland	1999	Luxembourg Income Study	Household Budget Survey	
	Russian Federation	2000	Luxembourg Income Study	Russian Longitudinal Monitoring Survey	
	Russian Federation	2000	World Bank	http://data.worldbank.org/country/	
	Serbia and Montenegro	2000	World Bank	http://data.worldbank.org/country/	
	Turkmenistan	2000	World Bank	http://data.worldbank.org/country/	
	Uzbekistan	2001	Deininger & Squire, World Bank 2004	Household Budget Survey	
	Albania	2000	World Bank	http://data.worldbank.org/country/	
	Bosnia and Herzegovina	2000	World Bank	http://data.worldbank.org/country/	
	Slovak Republic	2000	Transmonee 2004	Household Budget Survey	
	Slovak Republic	2000	World Bank	http://data.worldbank.org/country/	
	Slovenia	2000	Transmonee 2004	Household Budget Survey	
	Slovenia	2000	World Bank	http://data.worldbank.org/country/	
	Tajikistan	2000	World Bank	http://data.worldbank.org/country/	
	Ukraine	2000	Transmonee 2004	Household Budget Survey (World Bank, 2000)	
	Ukraine	1999	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Romania	2000	Transmonee 2004	Integrated Household Survey	
WENAO	Austria	2000	European Commission 2005	European Community Household Panel Survey	
	Belgium	2000	European Commission 2005	European Commuinty Household Panel Survey	
	Canada	2000	Luxembourg Income Study	Survey of Labour and Income Dynamics	
	Denmark	2000	Danmarks Statistik 2001	Administrative registers	
	France	2000	European Commission 2005	European Community Household Panel Survey	
	Germany	2000	European Commission 2005	European Community Household Panel Survey	
	Greece	2000	European Commission 2005	European Community Household Panel Survey	
	Ireland	2000	European Commission 2005	European Community Household Panel Survey	
	Israel	2001	Luxembourg Income Study	Family Expenditure Survey	
	Italy	2000	European Commission 2005	European Community Household Panel Survey	
	Luxembourg	2000	European Commission 2005	European Community Household Panel Survey	
	Netherlands	1999	European Commission 2005	European Community Household Panel Survey	
	New Zealand	2001	Perry 2005	Household Economic Survey	
	New Zealand	2000	World Bank	http://data.worldbank.org/country/	
	Norway	2000	Statistics Norway 2004	Income and Property Distribution Survey	
	Norway	2000	World Bank	http://data.worldbank.org/country/	
	Portugal	2000	European Commission 2005	European Community Household Panel Survey	
	Spain	2000	European Commission 2005	European Community Household Panel Survey	
	Sweden	2000	Luxembourg Income Study	Income Distribution Survey	
	Switzerland	1998	Atkinson, Rainwater and Smeeding 1995b	Swiss Income and Wealth Survey	
	Switzerland	2000	World Bank	http://data.worldbank.org/country/	
	United Kingdom	2000	European Commission 2005	European Community Household Panel Survey	

	United States	2000	Luxembourg Income Study	March Current Population Survey	
	United States	2000	Income expenditure survey, poverty and wealth	http://www.census.gov/compendia/statab/2012/tables/12s0678.pdf	
	Finland	2000	Luxembourg Income Study	Income Distribution Survey	
	Australia	2000	World Bank	http://data.worldbank.org/country/	
	New Zealand	2000	World Bank	http://data.worldbank.org/country/	
Africa	Nigeria	2000	World Bank	http://data.worldbank.org/country/	Distribution estimated from Distributions for 1996 and 2004, Income estimated through income for 2006 minus annual growth rate of country with similar income (in this case Burkina Faso)
	Burkina Faso	2000	World Bank	http://data.worldbank.org/country/	
	Cote d`Ivoire	2000	World Banlk	http://data.worldbank.org/country/	
	Djibouti	2000	World Bank	http://data.worldbank.org/country/	
	Egypt	2000	World Banlk	http://data.worldbank.org/country/	
	Ethiopia	2000	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Ghana	1999	World Bank Bulleitn Survey	http://siteresources.worldbank.org/INTSTATINAFR/Resources/bulletin06_gmb_1998.pdf	
	Madagascar	2001	World Bank Poverty Monitoring Database 2002	HBS	
	Madagascar	1999	World Bank Bulleitn Survey	http://siteresources.worldbank.org/INTSTATINAFR/Resources/bulletin09_mdg_1999.pdf	
	Morocco	1999	World Bank Poverty Monitoring Database 2002	Living Standards Measurement Survey	
	Morocco	2000	World Bank	http://data.worldbank.org/country/	
	Mauritius	2001	Mauritius CSO 2002	Household Budget Survey	
	Mauritius	2000	World Banlk	http://data.worldbank.org/country/	
	Senegal	2001	World Bank Poverty Monitoring Database 2002	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Tanzania	2001	National Bureau of Statistics Tanzania 2002	Household Budget Survey	
	Tanzania	2001	Household Budget Survey	http://www.tanzania.go.tz/hbs/Final_Report_HBS_Ch09.pdf	
	Tunisia	2000	World Bank Poverty Monitoring Database 2002	Enquete Nacional sur le Budget et la Consomation des Menages	
	Uganda	2000	Deininger & Squire, World Bank 2004	National Household Survey	
	Zambia	2000	World Bank	http://data.worldbank.org/country/	
	Angola	2000	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Burundi	2000	World Bank	http://data.worldbank.org/country/	
	Cameroon	2000	World Bank	http://data.worldbank.org/country/	
	Cape Verde	2002	Worldbank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Central African Republic	2000	World Banlk	http://data.worldbank.org/country/	
	Gambia	1998	World Bank Bulletin Survey	http://siteresources.worldbank.org/INTSTATINAFR/Resources/bulletin06_gmb_1998.pdf	
	Guinea-Bissau	2002	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Kenya	2000	World Bank	http://data.worldbank.org/country/	
	Malawi	2000	World Bank	http://data.worldbank.org/country/	
	Mali	2000	World Bank	http://data.worldbank.org/country/	
	Mauritania	2000	World Bank Poverty Monitoring Database 2002	Enquête Permanente sur les conditions de vie des menages	
	Mauritania	2000	World Bank	http://data.worldbank.org/country/	
	Mozambique	2000	World Bank	http://data.worldbank.org/country/	
	Rwanda	2000	World Bank	http://data.worldbank.org/country/	
	Sao Tome and Principe	2001	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do?Step=12&id=4&CNO=1208	
	Seychelles	2000	World Banlk	http://data.worldbank.org/country/	
	Swaziland	2000	World Bank, World Development	Household Income and Expenditure Survey	

			Indicators 2000		
	South Africa	2000	World Bank Poverty Monitoring Database 2002	Living Standards and Development Survey	
	Libya	2000	World Bank	http://data.worldbank.org/country/	Distribution taken from similar country (in this case Angola)
	Dem Rep Congo	2000	World Bank	http://data.worldbank.org/country/	Distribution taken from World Bank: Dem. Rep. Congo for 2006 (the only year available)
	Algeria	2000	World Bank	http://data.worldbank.org/country/	Distribution estimated through similar country (in this case Senegal)
Asia	China Urban	2000	John Knight 2007: Reform Growth and Inequality in China, p.5-6	http://www.iariw.org/papers/2007/knight.pdf	
	China Rural	2000	John Knight 2007: Reform Growth and Inequality in China, p.5-6	http://www.iariw.org/papers/2007/knight.pdf	
	China All	2000	World Bank	http://data.worldbank.org/country/	
	India All	2000	World Bank	http://data.worldbank.org/country/	
	India Rural	2000	SEN, HIMANSHUEconomic and Political Weekly September 18, 2004	http://www.csh-delhi.com/team/downloads/publiperso/ poverty_inequality_EPW_2.pdf	
	India Urban	2000	SEN, HIMANSHUEconomic and Political Weekly September 18, 2004	http://www.csh-delhi.com/team/downloads/publiperso/ poverty_inequality_EPW_2.pdf	
	Maldives	2000	World Bank	http://data.worldbank.org/country/	
	Maledives	1998	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do ?Step=12&id=4&CNO=1208	
	Mongolia	2000	World Bank	http://data.worldbank.org/country/	
	Korea, Republic of	2000	World Bank	http://data.worldbank.org/country/	
	Philippines	2000	World Bank	http://data.worldbank.org/country/	
	Singapore	2000	World Bank	http://data.worldbank.org/country/	
	Sri Lanka	2000	Deininger & Squire, World Bank 2004	Sri Lanka Integrated Survey	
	Sri Lanka	2000	World Bank	http://data.worldbank.org/country/	
	Thailand	2000	World Bank	http://data.worldbank.org/country/thailand	
	Indonesia	2000	World Bank	http://data.worldbank.org/country/	
	Lao	2000	World Bank	http://data.worldbank.org/country/	
	Malaysia	2000	World Bank	http://data.worldbank.org/country/	
	Timor Leste	2000	World Bank	http://data.worldbank.org/country/	
	Viet Nam	2000	World Bank	http://data.worldbank.org/country/	
	Nepal	2000	World Bank	http://data.worldbank.org/country/	
	Cambodia	2000	World Bank	http://data.worldbank.org/country/	Distribution taken from World Bank: Cambodia 2004)
	Bhutan	2000	World Bank	http://data.worldbank.org/country/	Distribution taken from World Bank: Bhutan 2003)
	Japan	2000	World Bank	http://data.worldbank.org/country/	Distribution taken from country with similar income (in this case Italy)
Middle East	Iran	1998	World Bank Poverty Database	http://databank.worldbank.org/ddp/home.do? Step=12&id=4&CNO=1208	
	Yemen	2000	World Bank	http://data.worldbank.org/country/	
	Turkey	2000	World Bank Poverty Monitoring Database 2002	Household Income Distribution Survey	
	Pakistan	2000	World Bank	http://data.worldbank.org/country/	
	Saudi Arabia	2000	World Bank	http://data.worldbank.org/country/	Distribution estimated through Morocco
	Afghanistan	2002	World Bank	http://data.worldbank.org/country/	Distribution taken from World Bank: Afghanistan 2008
	Syrian Arab. Rep.	2000	World Bank	http://data.worldbank.org/country/	

Data Sources 2005

<table>
<tr><td colspan="6">Data Sources 2005 Sample</td></tr>
<tr><td colspan="6">If data are not specified by survey name or web page (row: Source in detail) then data are taken unmodified from the UNU-WIDER Database (available at: http://www.wider.unu.edu/research/Database/en_GB/wiid/)</td></tr>
<tr><td>Region</td><td>Country</td><td>Year</td><td>Source1</td><td>Source in detail</td><td>Annotation</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>LAC</td><td>Argentina</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Permanente de Hogares-Continua, second half of year</td><td></td></tr>
<tr><td></td><td>Bolivia</td><td>2004</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Continua de Hogares- MECOVI</td><td>Mean income for 2005 estimated through mean income of Bolivia in 2000 plus mean annual growth rate of Bolivia.</td></tr>
<tr><td></td><td>Brazil</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Pesquisa Nacional por Amostra de Domicilios</td><td></td></tr>
<tr><td></td><td>Chile</td><td>2006</td><td>World Bank</td><td>http://worldbank.org/country/</td><td>Mean income for 2005 estimated through mean income of Chile in 2000 plus mean annual growth rate of Chile.</td></tr>
<tr><td></td><td>Costa Rica</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2008</td><td>Encuesta de Hogares de Propositos Multiples</td><td></td></tr>
<tr><td></td><td>Dominican Republic</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Nacional de Fuerza de Trabajo</td><td></td></tr>
<tr><td></td><td>Ecuador</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2008</td><td>Encuesta de Empleo, Desempleo y Subempleo</td><td></td></tr>
<tr><td></td><td>Guatemala</td><td>2003</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Nacional de Empleo e Ingresos</td><td></td></tr>
<tr><td></td><td>Guatemala</td><td>2006</td><td>World Bank</td><td>http://worldbank.org/country/</td><td></td></tr>
<tr><td></td><td>Honduras</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2008</td><td>Encuesta Permanente de Hogares de Propósitos Múltiples</td><td></td></tr>
<tr><td></td><td>Jamaica</td><td>2004</td><td>World Bank, World Development Report 2004</td><td>Jamaica Survey of Living Conditions</td><td></td></tr>
<tr><td></td><td>Mexico</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Nacional de Ingresos y Gastos de los Hogares</td><td></td></tr>
<tr><td></td><td>Nicaragua</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Nacional de Hogares sobre Medición de Nivel de Vida</td><td></td></tr>
<tr><td></td><td>Panama</td><td>2004</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta de Hogares</td><td></td></tr>
<tr><td></td><td>Paraguay</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta Permanente de Hogares</td><td></td></tr>
<tr><td></td><td>Peru</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2008</td><td>Encuesta Nacional de Hogares</td><td></td></tr>
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<tr><td></td><td>Venezuela</td><td>2005</td><td>Socio-Economic Database for Latin America and the Caribbean, 2006</td><td>Encuesta de Hogares Por Muestreo</td><td></td></tr>
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<tr><td></td><td>Hungary</td><td>2005</td><td>Deininger & Squire, World Bank 2004</td><td>Household Budget Survey</td><td></td></tr>
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<tr><td></td><td>Latvia</td><td>2005</td><td>Deininger & Squire, World Bank 2004</td><td>Household Budget Survey</td><td></td></tr>
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<tr><td></td><td>Macedonia, FYR</td><td>2004</td><td>Transmonee 2005</td><td>Household Budget Survey</td><td></td></tr>
<tr><td></td><td>Poland</td><td>2004</td><td>Transmonee 2005</td><td>Household Budget Survey</td><td></td></tr>
<tr><td></td><td>Slovak Republic</td><td>2004</td><td>Transmonee 2005</td><td>Household Budget Survey</td><td></td></tr>
<tr><td></td><td>Bosnia and Herzegovina</td><td>2005</td><td>World Bank, World Development Indicators 2004</td><td>Living Standards Measurement Survey</td><td></td></tr>
</table>

	Croatia	2005	World Bank, World Development Indicators 2004	http://worldbank.org/country/	
	Georgia	2005	World Bank, World Development Indicators 2004	Survey of Georgian Households	
	Kazakhstan	2005	World Bank	http://worldbank.org/country/	
	Azerbaijan	2005	World Bank Poverty Database	http://worldbank.org/country/	
	Romania	2005	Worldbank Poverty Database	http://worldbank.org/country/	
	Russian Federation	2005	World Bank Poverty Database	http://worldbank.org/country/	
	Serbia	2005	World Bank Poverty Database	http://worldbank.org/country/	
	Tajikistan	2004	World Bank, World Development Indicators 2005	Household Budget Survey	
	Ukraine	2005	World Bank, World Development Indicators 2005	Household Budget Survey	
	Uzbekistan	2005	World Bank	http://worldbank.org/country/	
	Albania	2005	World Bank	http://worldbank.org/country/	
	Moldova	2004	World Bank	http://worldbank.org/country/	
	Kyrgyz Republic	2005	World Bank	http://worldbank.org/country/	
	Slovenia	2005	CSO 2005	Household Budget Survey	
	Slovenia	2004	World Bank Poverty Database	http://worldbank.org/country/	
WENAO	Austria	2003	European Commission 2005	European Community Household Panel Survey	
	Belgium	2005	World Bank	http://worldbank.org/country/	
	Canada	2004	Luxembourg Income Study		
	Denmark	2005	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	Finland	2003	Statistics Finland 2005	Income Distribution Survey	
	France	2005	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	Germany	2005	Statistisches Landesamt Baden Württemberg	http://www.statistik-bw.de/Veroeffentl/Monatshefte/essay.asp?xYear=2008&xMonth=02&eNr=06	
	Greece	2003	European Commission 2005	European Community Household Panel Survey	
	Ireland	2005	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	Israel	2005	Luxembourg Income Study		
	Italy	2004	European Commission 2005	European Community Household Panel Survey	
	Luxembourg	2003	European Commission 2005	European Community Household Panel Survey	
	Netherlands	2006	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	Norway	2004	UN-ECE 1967	Tax data	
	Portugal	2004	European Commission 2005	European Community Household Panel Survey	
	Spain	2005	Goerlich & Mas (2007) update	Encuesta Continua de Presupuestos Familiares - ECPF97 / QHBS	
	Sweden	2003	Sweden CSO 2004	Income Distribution Survey	
	United Kingdom	2006	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	United States	2005	Economics and Statistics Administration	http://www.census.gov/prod/2006pubs/p60-231.pdf	
	United States	2005	Income expenditure survey, poverty and wealth	http://www.census.gov/compendia/statab/2012/tables/12s0678.pdf	
	United States	2005	Income expenditure survey, poverty and wealth	http://www.census.gov/compendia/statab/2012/tables/12s0678.pdf	
	Malta	2005	European Commission 2006	Household Budgetary Survey	
	Cyprus	2006	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	Iceland	2005	European Commission 2008	The European Union Statistics on Income and Living Conditions (EU-SILC)	
	New Zealand	2004	Perry 2005	Household Economic Survey	
	Australia	2004	Australian Bureau of Statistics 2005	Survey of Income and Housing	
Asia	China Rural	2005	John Knight 2007: Reform Growth and Inequality in China, p.5-6	http://www.iariw.org/papers/2007/knight.pdf	
	China Urban	2005	John Knight 2007: Reform Growth and Inequality in China, p.5-6	http://www.iariw.org/papers/2007/knight.pdf	
	India Rural	2005	Desai et al. (2010): India Human Development Survey	http://www.ncaer.org/downloads/Reports/HumanDevelopmentinIndia.pdf	
	India Urban	2005	Desai et al. (2010): India Human Development Survey	http://www.ncaer.org/downloads/Reports/HumanDevelopmentinIndia.pdf	
	Nepal	2004	World Bank Poverty Monitoring Database		
	Nepal	2005	The Survey of Family Income and Expenditure		

	Bangladesh	2005	World Bank, World Development Indicators 2004	Socio-Economic Survey	
	Cambodia	2004	World Bank Poverty Monitoring Database	Socio-Economic Survey	
	Indonesia	2005	World Bank, World Development Indicators 2004		
	Malaysia	2004	World Bank Poverty Monitoring Database	http://worldbank.org/country/	
	Maldives	2005	World Bank	http://worldbank.org/country/	
	Mongolia	2005	World Bank Poverty Database	http://worldbank.org/country/	
	Philppines	2005	World Bank	http://worldbank.org/country/	
	Sri Lanka	2005	World Bank	http://worldbank.org/country/	
	Thailand	2005	World Bank	http://worldbank.org/country/	
	Vietnam	2004	World Bank, World Development Indicators 2007		
	Vietnam	2005	World Bank	http://worldbank.org/country/	
	Bhutan	2005	World Bank	http://worldbank.org/country/	
	Korea South	2004	Luxembourg Income Study	Expenditure and Income Survey	
	Japan	2005	World Bank	http://worldbank.org/country/	
Middle East	Iran	2005	World Bank	http://worldbank.org/country/	
	Syrian Arab Rep.	2005	World Bank	http://worldbank.org/country/	
	Yemen, Republic of	2005	World Bank	http://worldbank.org/country/	
	Turkey	2005	World Bank	http://worldbank.org/country/	
	Jordan	2006	Word Bank	http://worldbank.org/country/	
	Pakistan	2005	World Bank	http://worldbank.org/country/	
Africa	Cameroon	2005	World Bank	http://worldbank.org/country/	
	Egypt	2005	World Bank	http://worldbank.org/country/	
	Ethiopia	2005	World Bank	http://worldbank.org/country/	
	Ethiopia	2005	Household Income, Consumption and Expenditure Survey 2004/05	http://www.csa.gov.et/surveys/Consumption/Consumption_2004/survey0/data/Document/Report/HICE%202004%20Analytical%20Report%20Volume%20I.pdf	
	Ethiopia	2005	World Bank	http://worldbank.org/country/	
	Kenya	2005	World Bank Poverty Database	http://worldbank.org/country/	
	Morocco	2005	World Bank	http://worldbank.org/country/	
	South Africa	2006	World Bank Poverty Database	http://worldbank.org/country/	
	Burkina Faso	2005	World Bank	http://worldbank.org/country/	
	Burundi	2005	World Bank	http://worldbank.org/country/	
	Central African Republic	2005	World Bank	http://worldbank.org/country/	
	Comoros	2005	World Bank	http://worldbank.org/country/	
	Dem Rep.Congo	2005	World Bank Poverty Database	http://worldbank.org/country/	
	Gambia	2005	World Bank	http://worldbank.org/country/	
	Gabon	2005	World Bank	http://worldbank.org/country/	
	Guinea	2005	World Bank	http://worldbank.org/country/	
	Madagascar	2005	World Bank	http://worldbank.org/country/	
	Malawi	2004	World Bank, World Development Indicators 2004	http://worldbank.org/country/	
	Malawi	2005	World Bank	http://worldbank.org/country/	
	Niger	2005	World Bank	http://worldbank.org/country/	
	Rwanda	2005	World Bank	http://worldbank.org/country/	
	Senegal	2005	World Bank	http://worldbank.org/country/	
	Seychelles	2005	World Bank	http://worldbank.org/country/	
	Tanzania	2005	World Bank	http://worldbank.org/country/	

	Country		Source		
	Togo	2005	World Banlk	http://worldbank.org/country/	
	Uganda	2005	World Bank	http://worldbank.org/country/	
	Uganda	2005	World Bank	http://worldbank.org/country/	
	Sierra Leone	2005	World Bank	http://worldbank.org/country/	
	Zambia	2004	World Bank, World Development Indicators 2007	http://worldbank.org/country/	
	Nigeria	2004	World Bank	http://worldbank.org/country/	
	Nigeria	2006	National Survey	http://www.insipub.com/ajbas/2008/134-140.pdf	
	Ghana	2005	World Bank	http://worldbank.org/country/	
	Ghana	2005	National Survey	http://www.statsghana.gov.gh/docfiles/glss5_report.pdf	