

Is the Developing World Catching Up?  
Global Convergence and National Rising Dispersion

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## Abstract

The present study uses the GIDD, a CGE-microsimulation model for Global Income Distribution Dynamics, to understand the ex-ante dynamics of global income distribution. Three main robust results emerge. First, under a set of realistic assumptions, there will be a reduction in global income inequality by 2030. This potential reduction can be fully accounted for by the projected convergence in average incomes across countries, with poor and populous countries growing faster than the rest of the world. Second, this convergence process will be accompanied by a widening of income distribution in two-thirds of the developing countries; the

main cause being increasing skill premia. Third, a trend that may counter-balance the potential anti-globalization sentiment is the emergence of a global middle class: a group of consumers who demand access to, and have the means to purchase, international goods and services. The results show that the share of these consumers in the global population is likely to more than double in the next 20 years. These ex-ante trends in global income distribution suggest that the mid-1990s could be seen as a turning point after which global inequality began showing a negative tendency.

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This paper—a product of the Development Economics Prospects Group—is part of a larger effort in the department to collect data and develop analytical tools for monitoring poverty and income distribution impacts of global economic trends. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at [mbussolo@worldbank.org](mailto:mbussolo@worldbank.org), [rdehoyos@worldbank.org](mailto:rdehoyos@worldbank.org), [dmedvedev@worldbank.org](mailto:dmedvedev@worldbank.org).

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# Is the Developing World Catching Up? Global Convergence and National Rising Dispersion

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# 1 Introduction

With the increasing pace at which domestic markets are becoming integrated into the global economy, the debate on income disparities around the world has intensified. An interesting side-effect of globalization has been to change the benchmark against which people measure their own well-being. Increased international trade flows, greater exposure to international travel, and improved and cheaper communication have all made it easier to assess one's well-being within an international context. These phenomena are giving more relevance to the concept of global income distribution (Milanovic 2006). The common understanding is that the recent globalization process has exacerbated inequalities between rich and poor *countries* and between rich and poor *individuals* within countries. The literature, nevertheless, does not provide an unambiguous support for this statement. Among others, Bourguignon and Morrison (2002) show that during the last 30 years the global income distribution experienced very little change, Sala-i Martin (2006) argues that global disparities have reduced in the last years, and in a diametrically opposing view, Milanovic (2002) suggests that the global distribution deteriorated between 1988 and 1993.<sup>1</sup>

All of the literature on the global income distribution is concerned with *ex-post* assessments of its changes and a large proportion of this literature is focused on testing whether globalization has increased or decreased global inequality. The present study is quite different from earlier work by focusing on the *ex-ante* prospects for global income distribution. We develop a novel analytical framework—the Global Income Distribution Dynamics (GIDD), which combines a computable general equilibrium (CGE) model with a micro-simulation system at the global level and is a further development of the approach in World Bank (2006; Chapter 3) and Bussolo et al

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<sup>1</sup> Most of the discrepancies in the trends in global income distribution arise from the differences in data sources, country/year coverage, and the way in which different studies impute missing data. Bourguignon and Morrison (2002) and Sala-i Martin (2006) use GDP per capita as the measure of average incomes across countries whereas Milanovic (2002) use the mean income reported by household survey data.

(2007).<sup>2</sup> The GIDD generates a counterfactual global income distribution by taking into account the expected changes in the age and education structure of the population, worker migration from farming to non-farming activities, changes in skilled-to-unskilled and farming-to-non-farming wage premiums, as well as different income growth rates across countries. The latter give rise to the *convergence* component of changes in global inequality, i.e. changes in global distribution due to changes in average incomes between countries while keeping within-country inequality constant. Other changes—demographic transition, internal migration, and the evolution of wage gaps—generate the *dispersion* component, i.e. the expected changes in the income distribution within countries. Thus, GIDD-based analysis allows us to understand how changes in global income distribution are accounted for by changes in growth rates across countries and changes in income differences within countries. By estimating a global Macro-Micro model, this study represents a big leap in our understanding of global income inequality.

The forward-looking scenario in this study draws attention to several important developments that are likely to shape the evolution of the global income distribution over the next 25 years. Convergence of average incomes of developing countries to high-income levels is likely to offset worsening within-country distributions in many nations and lead to a significant decline in global inequality. Furthermore, inequalities around the world are likely to converge as countries with high initial inequality experience a narrowing of income gaps while countries with low initial inequality are likely to see their distributions widen. Finally, these trends are likely to result in the emergence of a large global middle class, composed mostly of developing country nationals. These future trends have important political economy implications with the increase in the global middle class increasing the support for further liberalizing reforms while the rise in within-country inequality counter-balancing this effect. This tradeoff could be eliminated if trade liberalization and other market-friendly reforms are complemented with income redistribution policies.

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<sup>2</sup> A new dataset was assembled as part of the GIDD project. A summarized version of the new dataset containing income information by quintiles as well as a paper documenting the steps followed to construct it is available from the authors upon request.

The paper is organized in the following way. The next section discusses the contributions on global income distribution, identifying the sources behind the debate about its recent trends. Section 3 describes the model and dataset used behind the Global Income Distribution Dynamics (GIDD) module which is then used to undertake ex-ante simulations of global inequality. The simulation results are presented in Section 4. In this section we use the GIDD to project the global income distribution for 2030; we decompose the total change in inequality into the effects due to changes in average income between-countries and changes explained by shifts in within-country inequality. The ex-ante changes in the global middle class in each of the 120 countries included in the GIDD are also presented in Section 4. Finally, Section 5 draws policy implications and concludes.

## **2 Are incomes around the world becoming more unequal?**

Assessing what has happened to global income distribution in the last two decades, and predicting what will happen in the next 25 years, presents a number of challenges. Part of the difficulty lies with choosing an appropriate measure of inequality to capture income disparities around the world. The literature identifies three main approaches to measuring income inequality around the world, all of which have strengths, but each of which measures a slightly different thing.<sup>3</sup>

1. *Intercountry inequality* is a concept favored by macroeconomists. It measures relative movements across countries and gives each country an equal weight in the world distribution (that is, population size does not matter). This literature tends to conclude that in the last two decades, income distribution has become more unequal.

2. *International inequality* takes into account the relative sizes of countries (that is, results are population-weighted). Its proponents (such as Theil and Seale 1994) point out that failing to use population weights will cause, for example, the fast

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<sup>3</sup> In this discussion the authors have adopted the naming conventions of World Bank (2005). Milanovic (2005) refers to the following different measurements as inequality concepts 1, 2, and 3.

growth of China to be exactly offset by the anemic growth rates of Malawi or Haiti, even though the number of Chinese citizens who experienced improvements in their incomes far exceeds the populations of either of the other two countries<sup>4</sup>. The broad consensus of this literature is that income inequality has decreased, although this finding is mostly driven by the fast growth in China and India.<sup>5</sup>

3. *Global inequality*, which compares individual incomes regardless of country of citizenship, is a fairly recent concept (Milanovic 2002). Global inequality takes into account within-country inequality, which is ignored by the international inequality approach, where each individual is deemed to earn the country's average income. To a large extent, fast growth in the large emerging economies tends to offset the increases in inequality within countries (see Bussolo et al, (2007)); therefore by this measure, global inequality has remained roughly constant since the late 1980s.

Even though these three methodologies can yield quite different pictures of past and future trends, and none is clearly preferable to the others (Ravallion 2004), it is worth elaborating on some general trends.<sup>6</sup>

Intercountry measurements of inequality suggest that the last five decades of development have done little to bring the average incomes of developing countries closer to those of the countries of the Organisation for Economic Co-operation and Development (OECD). For example, Quah (1996, 1997) finds "emerging twin peaks" in the global distribution, supporting the argument that the relative distance between the top and the bottom of the global income distribution has increased since the 1950s. More generally, Pritchett (1997) has concluded that a "big time" divergence in incomes occurred between 1870 and 1990, evidenced by a doubling of the gap

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<sup>4</sup> Bourguignon, Levin, and Rosenblatt (2004) point out that using the intercountry concept may represent an implicit welfare judgment, whereby the rising incomes of more populous countries cannot offset the losses of smaller countries when their incomes are falling.

<sup>5</sup> The influence of China and India is so large that omitting these two countries would reverse the conclusion: international inequality excluding China and India has increased in the past two decades, for more on this subject, see Bussolo et al. (2007).

<sup>6</sup> It should also be noted that measurement of inequality is sensitive to both the precise indicators used to measure it and the time horizon chosen.

between the per capita incomes of the rich and poor countries.<sup>7</sup> Underlying this general pattern is a large degree of variation in individual country performance, with growth peaks and valleys across various regional groupings and time periods. However, the overall trend is of an increasing distance between countries in different income brackets, although Pritchett (1997) also shows evidence of convergence at the top of the distribution (that is, among the group of today's high-income countries).

Once different weights are assigned to countries based on their population (using the international inequality approach), the global income distribution appears to have improved. For example, Bourguignon, Levin, and Rosenblatt (2004) demonstrate a decrease in world income inequality between 1980 and 2002, as long as the relevant inequality measures are not too sensitive to the distance of mean income from the bottom.<sup>8</sup> Using the Gini, the Theil index, and mean logarithmic deviation, Atkinson and Brandolini (2004) observed a similar decrease in global income inequality between 1970 and 2000.

The extent of changes in these conclusions once a within-country inequality dimension is added has been an intensely debated subject. Milanovic (2002) suggests that ignoring intra-country income inequality may lead to a completely different understanding about the levels and trends of global inequality. On the other hand, Bourguignon and Morrison (2002) argue that inequality between countries has been responsible for most of the time-series variation in global inequality. Thus, despite the finding of the World Bank (2005) that within-country inequality has been steadily increasing since the late 1980s, the overall direction of change in global inequality since the 1980s is not clear.<sup>9</sup>

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<sup>7</sup> The ratio of per capita incomes of the richest and poorest country in Pritchett's (1997) sample has grown by a factor of more than five between 1870 and 1990.

<sup>8</sup> Bourguignon, Levin, and Rosenblatt (2004) show that it is possible to produce rising inequality statistics if, for example, the sensitivity of the Atkinson inequality index to deviations from mean income at the bottom of the distribution is set sufficiently high (over five).

<sup>9</sup> Some of the studies examining global inequality have relied on parameterized Lorenz curves to add the within-country dimension to the analysis: see for example, Sala-i-Martin (2002a), Sala-i-Martin (2002b), and Bhalla (2002). Others, such as Milanovic (2002) and World Bank (2005), have built up the global distribution from household surveys.



### 3 Methodology: Global Income Distribution Dynamics<sup>10</sup>

The GIDD framework is based on CGE-microsimulation methodologies developed in the recent literature, including Bourguignon, Bussolo and Pereira da Silva (2003); Chen and Ravallion (2003); Ferreira and Leite (2003); and Bussolo, Lay, and van der Mensbrugge (2006). The starting point is the global income distribution in 2000, assembled using micro data from various sources as follows: a) for 73 low and middle income countries, household surveys are available (together they account for 1.2 million households and over 5.1 million individuals); b) for 25 high-income and 22 developing countries, only grouped income data (usually vintiles) is available. These 120 countries cover more than 90 percent of the global population (see Bussolo et al. (2007) for a full detailed list).<sup>11</sup> The hypothetical 2030 distribution is then obtained by applying three main exogenous changes to the initial distribution: (a) demographic changes, including aging and shifts in the skill composition of the population; (b) shifts in the sectoral composition of employment; and (c) economic growth, including changes in relative wages across skills and sectors.

The GIDD's framework is depicted in Figure 1. Our simulations include the expected changes in the shares of population by groups formed by age and education characteristics (top boxes of Figure 1). The future changes in population shares by age (upper left part of Figure 1) are taken as exogenous from the population projections provided by the World Bank's Development Data Group. Therefore, we assume that fertility decisions and mortality rates are determined outside the model. As fertility rates decrease and life expectancy increases, older age cohorts will become larger in many countries. The change in shares of the population by education groups incorporates the expected demographic changes assuming that--since the younger generations are better educated than older ones--as population ages, educational attainments increase (linking arrow from top left box to top right box in Figure 1). To

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<sup>10</sup> See Bussolo, De Hoyos, and Medvedev (2008) for a detailed explanation of the GIDD's methodology.

<sup>11</sup> Throughout the paper, when we talk about the global distribution, we are indeed referring to the GIDD's sample covering 90 percent of the world population.

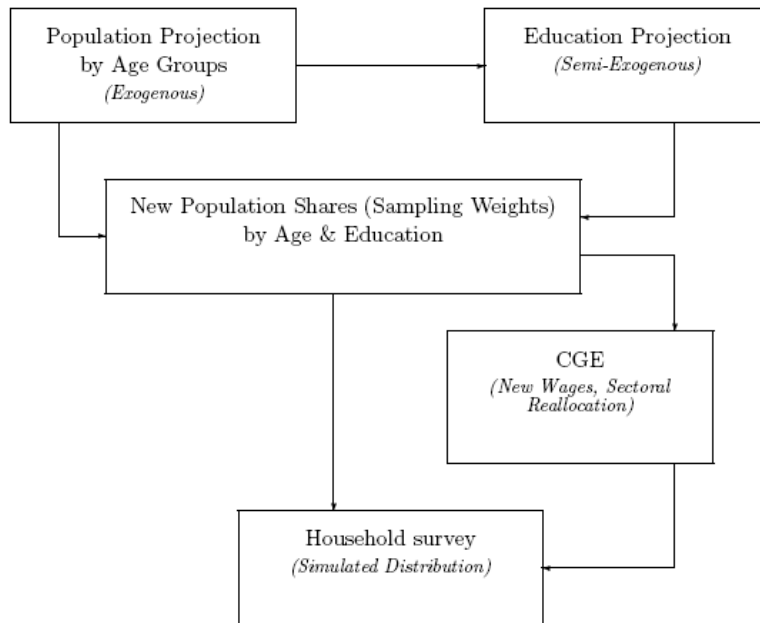
accommodate these changes in the survey data, larger weights have been assigned to older people than those assigned to younger individuals. Next, new sets of population shares by age and education subgroups are projected and household sampling weights are re-scaled according to the demographic and educational changes above (larger box in the middle of Figure 1). In a second step, the demographic changes will impact labor supply growth by age and skill groups. These changes are incorporated into the CGE model to simulate overall economic growth, growth in relative incomes by education groups and sector reallocation of labor (link between the middle and bottom rectangles).<sup>12</sup> Finally, consistent with an overall growth rate of real income per capita, changes in labor remuneration by skill level and sector are applied to each worker in the sample depending on their education and sector of employment. The number of workers changing sector of occupation and the growth differential in labor remuneration which are used to "shock" the micro-data are consistent with the results of the global computable general equilibrium (CGE) model (bottom link in Figure 1). In reality these changes take place simultaneously, but in the GIDD's simplified framework they are accommodated in a sequential fashion.

The sequential changes described above reshape national income distribution under a set of strong assumptions. In particular, income inequality within population subgroups formed by age, skills, and sector of employment is assumed to be constant over the period. Moreover, data limitations affect estimates of the initial inequality and its evolution. Although consumption expenditure is a more reliable welfare measure than income, and its distribution is normally more equal than the distribution of income, consumption data are not available for all countries' surveys. To get a global picture, the present study had to include in the same dataset countries with consumption information and countries for which only income data were available.

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<sup>12</sup> The GIDD uses the World Bank's LINKAGE global CGE model. LINKAGE is a relatively standard CGE model with many neoclassical features currently based on the Global Trade Analysis Project (GTAP) Release 6.3 with a 2001 base year (for the full details, see van der Mensbrugghe (2006)).

**Figure 1: Empirical Framework**



Finally, measurement errors implicit in purchasing power parity exchange rates, which have been used to convert local currency units, also affect comparability across countries. The resulting income distribution should thus not be seen as a forecast of what the future distribution might look like; instead it should be interpreted as the result of an exercise that captures the *ceteris paribus* distributional effect of demographic, sectoral, and economic changes. Although the results of this exercise provide a good starting point for debating potential policy trade-offs, they should not be used as the basis for detailed policy blueprints.

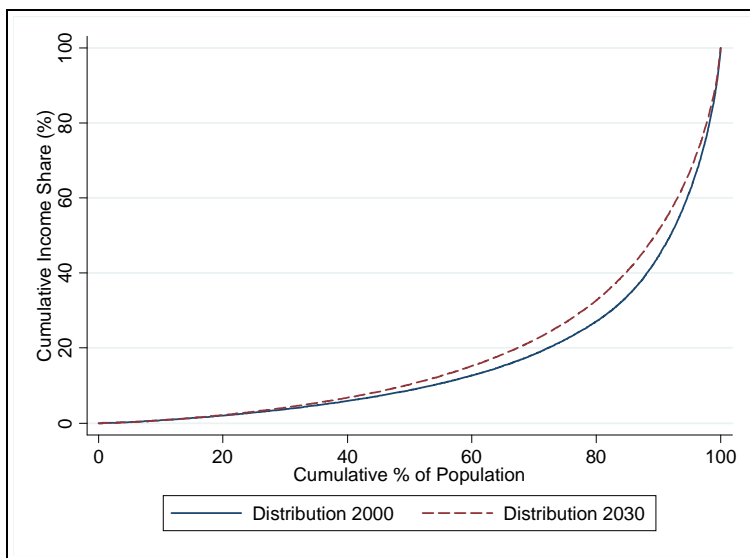
Notice that within the GIDD, the *convergence* component of the global income distribution, i.e. the growth differentials in average incomes or consumption, and the *dispersion* component, i.e. changes in the within-country distribution of income or consumption, will be determined in a simultaneously consistent way. In other words, if, for instance, the exogenous changes in a country's demographic structure are associated with higher growth in per capital incomes but also with higher inequality, these two effects will be captured by our model. The implications of the *convergence* and *dispersion* components for global inequality will be

determined by the country's initial position in the global distribution. Hence, the global distributional effect of higher-than-average growth rates in poor countries (those in the lower part of the global distribution) will have an inequality-reducing effect; the global distributional effect of changes in within-country dispersion will also depend on the country's initial position in the global distribution (for a detailed discussion along these lines see Bussolo, et al. 2007).

## 4 The global income distribution in 2030

We use the methods developed in the previous section to “roll” the global economy to 2030. The macroeconomic assumptions underlying this exercise as well as the prospects for global growth have been discussed in World Bank (2006; Chapter 2) and Bussolo, et al. (2007). In this study we concentrate on the global distributional effects behind the expected changes in per capita incomes and its distribution within countries.

Figure 2: Global Lorenz Curves



In

Figure 2 we plot the Lorenz curves for the observed global income distribution in 2000

and the projected distribution in 2030. From the figure it appears that the largest changes in income distribution between 2000 and 2030 are found around the middle of the distribution rather than towards the upper or lower tails of the distribution. In fact, because the two Lorenz curves intersect in these tails, it is not possible to say that the 2030 distribution Lorenz-dominates that of 2000, i.e. we *cannot* claim that inequality in 2030 is lower as compared with 2000 regardless of the inequality measured being used. However, using standard inequality statistics such as the Gini, the Theil, and the mean logarithmic deviation – i.e. indicators that do not give too much weight to the extreme parts of the distribution – a marked reduction of inequality, as shown in

Table 1, is recorded during the period considered here. These expected trends in global income distribution suggest that the mid-1990 could be seen as a turning point after which global inequality began showing a negative tendency.

Table 1: Global Income Inequality Indices

Index			Dispersion	Convergence
	2000	2030	Only	Only
Gini	0.672	0.626	0.673	0.625
Theil	0.905	0.749	0.904	0.749
Mean Log Deviation	0.884	0.764	0.893	0.759

Data source: Authors' own calculations using data from GIDD

The remainder of this section analyzes the factors driving these expected distributional changes by means of two complementary approaches. First, we conduct the analysis in terms of the convergence and dispersion components, i.e. changes in income disparities between and within countries. This is taken up in the next two sub-sections, which show that the reduction in global income inequality between 2000 and 2030 is the outcome of two opposing forces: the inequality-reducing convergence effect and the inequality-enhancing dispersion effect (

Table 1). In other words, poor countries will catch up but it will come at a cost in terms of higher within-country income inequality. These results suggest the continuation of recent trends documented in Ferreira and Ravallion (2008) using a large sample of countries covering 93 percent of the population in the developing world. Second, we develop an alternative way of analyzing the evolution of the global income distribution

by focusing on the global middle class. The third sub-section shows that the combination of the convergence and divergence components described earlier is the cause behind the dramatic increase in the size of the global middle class and its profound compositional change in favor of developing country nationals. In particular, developing country members of the global middle class are likely to become an increasingly important group within their own countries, raising their political influence and providing continued momentum for policies favoring global integration

#### **4.1 Dispersion component: Intra-country inequality on the rise**

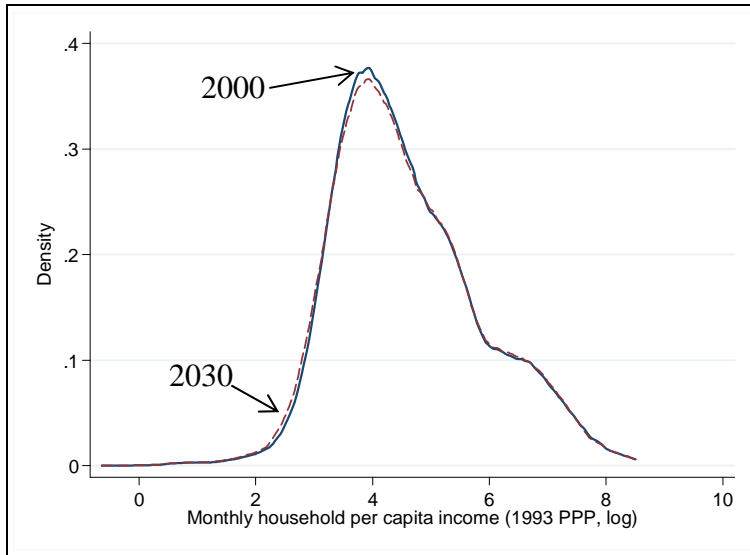
Within-countries, income distribution will be altered by: demographic changes, changes in skilled-to-unskilled wage premia, and rural-urban migration. In Figure 3 we plot non-parametric kernel densities of the global income distribution in 2000 together with a hypothetical distribution capturing only the changes in within-country inequality between 2000 and 2030. The hypothetical distribution was created by dividing household incomes in 2030 by the country-specific growth rate of the average incomes between 2000 and 2030. In other words, the dispersion component is the outcome of all the changes outlined in Section 3 keeping constant average incomes in each country, i.e. eliminating the convergence component.

At the global level, distributional changes within countries have a slight inequality-enhancing effect, with the global income distribution increasing in 0.1 of a Gini point (see

Table 1). Within-country income distribution is affected by three sets of factors: shifts in the *demographic structure* of the population, in terms of aging and education attainment, rural to urban migration, and changes in rewards for *individuals' characteristics*, such as their education level and sector of employment. Therefore, the changes in income distribution within each country can be further decomposed into changes due to shifts in the demographic structure of the labor force and changes due to adjustments in the rewards to personal characteristics. Creating a hypothetical global income distribution for the case where the only changes occurring between 2000 and 2030 were the shifts in the demographic structure within each country, we can show that the global Gini coefficient would have

remained practically constant. Hence the *dispersion* component is basically explained by changes in rewards to individual's characteristics.

**Figure 3: Dispersion Component 2000-2030**

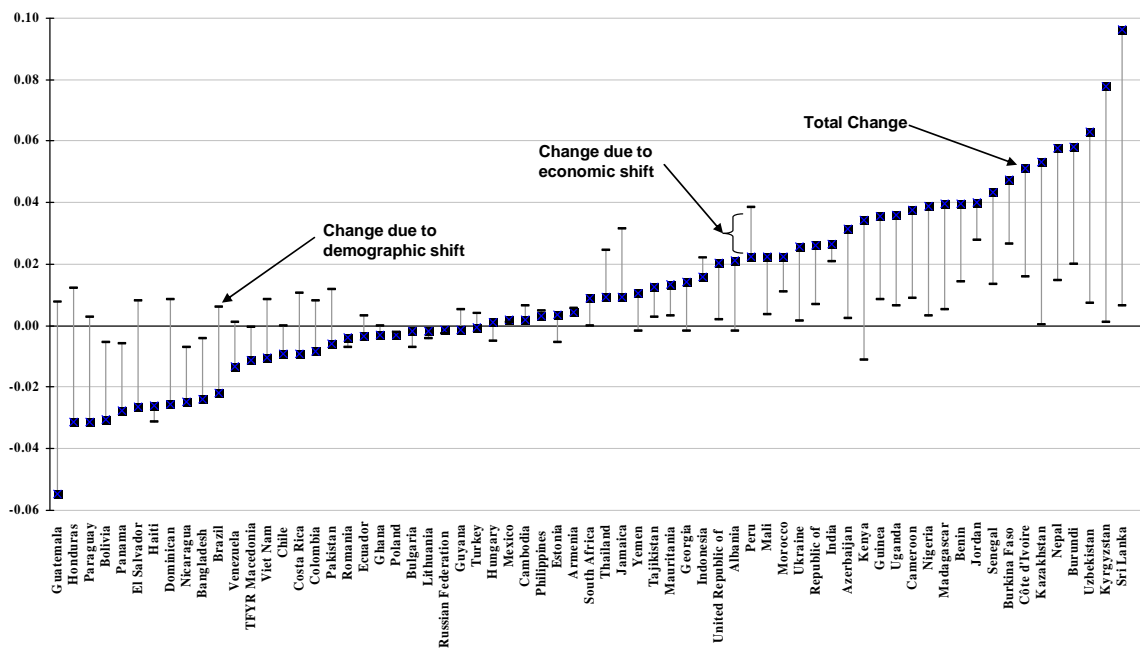


The rather modest impact brought about by the dispersion component (a tenth of a Gini point) can be hiding important country-specific changes that at the global level end up canceling out each other. To explore this possibility Figure 4 shows the change in the Gini coefficient for each country between 2000 and 2030. More than two-thirds of low- and middle-income countries in the study sample, comprising 86 percent of the population in the developing world, are projected to experience a rise in inequality by 2030. For some countries the increase is quite significant. The pure demographic component is depicted by the horizontal bars in Figure 4. Notice that there is very little correlation between the distributional effects of demographic changes and the total change in within-country inequality. Therefore, as we already mentioned, the general positive shifts in country-specific Gini coefficients can be attributable to increases in the skilled-to-unskilled wage premium (the difference between solid squares and the horizontal bar in Figure 4).

Almost all the countries expecting a reduction in inequality are highly unequal Latin American economies. On the other hand, inequality-increasing changes take place in African and Asian countries with relatively low initial inequality. As we

mentioned before, widening gaps in factor rewards, particularly the premium paid for higher skills, tend to produce larger changes in inequality and generally determine the overall direction of the effect. The results therefore illustrate a "convergence" of income distributions across countries, suggesting that the recent trends documented in Benabou (1996), Ravallion (2003) and Ferreira and Ravallion (2008) are likely to continue in the future.

Figure 4: Variation of Gini coefficient between base year and 2030



## 4.2 Convergence component: The poor world is catching-up

There are three aspects determining the existence, sign, and magnitude of each country's contribution to the convergence component: (1) a particular country will have a global distributional impact if its rate of growth differs from the global average; (2) given that condition (1) is satisfied, the sign of the distributional effect will depend on the country's initial position in the global distribution; and (3) the magnitude of the impact is determined by the size of the growth rate

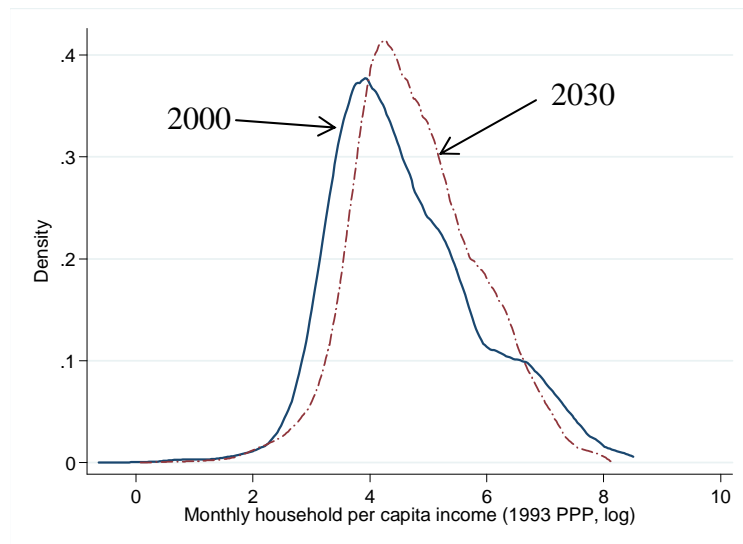


differentials (with respect the global average) and the country's share in the global population. Hence, initial poor countries with higher-than-average growth rates will have an inequality-reducing effect with a magnitude determined by the size of the country's population.

Figure 5 shows the change of the global income distribution due to differences in growth rates between countries when global average income is kept constant. Had the convergence effect been the only change taking place between 2000 and 2030, global inequality would have reduced by about 5 Gini points (see

Table 1). This means that the improvement in the global distribution reported in the simulation is entirely explained by growth rates differentials across countries with poor countries catching up with middle- and high-income countries.

Figure 5: Convergence Component 2000-2030



### ***4.3 The middle of the distribution: Is a global middle class emerging?***

The previous sections focused on explaining changes in global income inequality by using a standard decomposition analysis. Three main results have emerged: first, even with significant changes of within-country inequality levels, all the potential reduction of global inequality can be accounted for by the projected convergence in growth rates of average incomes across countries. Second, the global impact of the changes of the within-

countries component of inequality appears to be minor. However, specific countries and specific household types within countries may experience large distributional shifts. Third, a main cause of local inequality changes is the adjustments of factor rewards. To put these results into a more practical and policy relevant perspective, this section considers what happens to a specific income group during the 2000-2030 time period. The group under consideration is labeled “global middle class” (GMC) and consists of people whose income levels are between the average incomes of Brazil and Italy, in purchasing power parity terms.<sup>13</sup>

The idea of focusing on this group is that it should permit to expose more clearly – or at least under a different light vis-à-vis the previous decomposition analysis – the links between growth, inequality, globalization and policy. More explicitly, in GMC terms the growth convergence mentioned above means that citizens from developing countries should account for a larger share of this middle class income group and also that the overall size of this group should increase. This should have implications for international policies, such as multilateral trade liberalization that, in turn, have boosted globalization in recent decades. And depending of what happens to the middle class within each country, also domestic policies may change. Even with increasing within-country inequality, as shown above, developing country members of the GMC are likely to become a much stronger force in domestic politics as they would be increasingly considered “middle class” in their own countries. Mayda and Rodrik (2005) confirm these hypotheses while showing that individuals’ relative economic and social status is highly correlated with pro-globalization preferences. The literature on the political economy of trade policy proposes that the direction of policy is determined by the preferences of the median voter (Mayer 1984). The median voter in 2000 in most developing countries is unlikely to be a member of the middle class, which may help explain why some studies find a negative relationship between pro-market policies of the

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<sup>13</sup> In 1993 PPP prices, the lower threshold is 303 dollars per person per month, while the upper threshold is 611 dollars per person per month. This means that per capita earnings of members of the global middle class are 10 to 20 times above the international poverty line of 1 dollar a day. These income thresholds are due to the global middle class definition proposed by Milanovic and Yitzhaki (2002).

incumbent party and its performance at the ballot box (Olivera and Lora 2005), however this situation, as shown in Table 2 and Figure 6, may be quite different by 2030.

**Table 2 Composition of the global middle class in 2000 and 2030 (%)**

	2000		2030	
	Pop.	Income	Pop.	Income
Poor (per capita income below the average of Brazil)	81.7	29.1	61.9	15.5
Middle class (per capita income between Brazil and Italy), of which:	7.9	14.6	16.6	14.4
High income country nationals	3.7	7.4	0.8	0.8
Low and middle income country nationals, of which:	4.1	7.2	15.8	13.6
East Asia and Pacific	1.5	2.6	8.9	7.8
Eastern Europe and Central Asia	0.9	1.6	2.3	2.0
Latin America and Caribbean	1.1	2.0	1.9	1.6
Middle East and North Africa	0.4	0.7	0.8	0.6
South Asia	0.0	0.0	1.7	1.4
Sub-Saharan Africa	0.2	0.3	0.3	0.2
Rich (per capita income at or above the average of Italy)	10.4	56.3	21.5	70.1
Total	100	100	100	100

Source: Authors' calculations based on simulations from the GIDD.

Our estimates show that the GMC is likely to grow from 430 million in 2000 to 1,147 million in 2030, more than doubling its share in the global population (Table 2). Furthermore, the composition of this group of consumers is likely to change radically: while in 2000 developing country nationals accounted for 52 percent of the GMC, by 2030 they are likely to represent 95 percent of its population (Table 2). The biggest contributors to the increase in the number of the GMC members are the Asian countries led by China and India. These two countries alone are responsible for nearly two-thirds of the entire increase in the GMC, with China accounting for 52 percent of the rise in the GMC population and India adding another 12 percent (Bussolo et al., 2007). At the same time, the re-orientation of the global middle class towards citizens of low and middle income countries is very broad-based, with all six World Bank developing regions contributing to the growth in the GMC. As shown in Figure 6, nearly all developing countries in our sample see an increase in the proportion of the GMC members in their populations. There are only six exceptions to this observation, and five of them—the

Czech Republic, Slovakia, Slovenia, Hong Kong, and Singapore—are today’s upper middle class countries transitioning to high-income status.

There are several reasons behind the dramatic increase projected in the size of the GMC and the major shift in composition in favor of the low- and middle-income countries. Faster population growth in the developing world is responsible for some of the change in the composition. Thus regions with population growth above the world average (for example, South Asia and Sub-Saharan Africa) will increase their share in the global middle class. The main determinant of joining the middle class ranks, however, is not population growth but income growth. Although East Asia’s population grows more slowly than the world average, this region is projected to increase its share of residents in the global middle class by a factor of almost six, compared with a doubling for Africa. The difference is due to the fact that annual per capita income growth in Asia is forecasted to be more than twice the growth in Sub-Saharan Africa, easily offsetting the decline in the former’s population share.

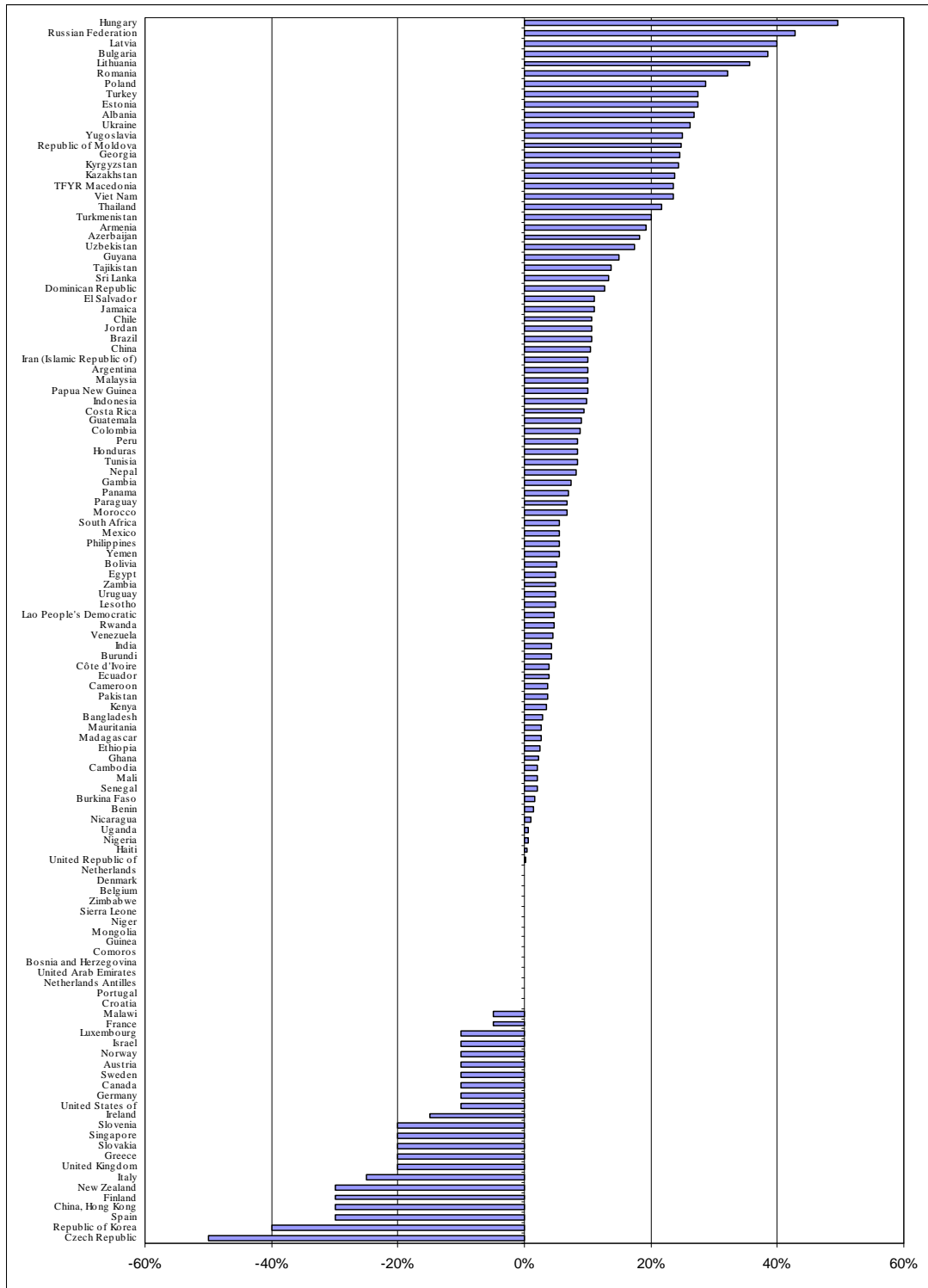
Another determinant of the changing composition of the middle class is the (unequal) shape of the initial income distribution by region. South Asia, which could see a dramatic increase (31-fold) in the share of its residents in the global middle class, is currently the least unequal region in the world. This means that the benefits of its projected per capita growth of 3.9 percent per year (roughly equal to that of East Asia) are distributed across the population much more equally than in other regions. By contrast, the initial inequality in Sub-Saharan Africa is much higher: the Gini coefficient of Africa in 2000 is 1.7 times the Gini of South Asia, while the Generalized Entropy inequality indices (e.g., Theil coefficient, mean log deviation) are nearly three times as high for Sub-Saharan Africa as they are for South Asia. Therefore, any amount of growth is much less effective at moving large numbers of people up the ladder of income distribution in Sub-Saharan Africa relative to other regions with lower inequality.

Most developing-country members of today’s (as of 2000) global middle class earn incomes far above the averages of their own countries of residence. In other words, being classified as middle class at the global level is equivalent to being at the top of the distribution in many low-income countries. For example, in our sample, as of 2000, 183

million (out of the total 240 million) developing country citizens in the global middle class are in the top 20 percent of earners within their own countries. By contrast, only 15 percent of global middle-class members occupy the lower seven deciles of their national income distributions. Thus, for many nations, the correspondence between the global middle class and the within-country middle class is quite low. The situation will change quite dramatically by 2030. A full 63 percent of developing country members of the global middle class will be earning incomes in the seventh decile or lower at the national level. Consider the example of China, where 56 million people belonged to the global middle class in 2000—each of them earning more than 90 percent of all Chinese citizens. By 2030, there will be 429 million Chinese in the global middle class, and their earnings will range from the sixth to the ninth decile of the Chinese national income distribution. They will no longer be among the richest Chinese citizens but will probably be considered upper middle class in their own country. Another example is Brazil, a country that grows one-third as fast as China in per capita terms. Even with slower growth, the number of Brazilians in the GMC will rise from 28 million in 2000 to 55 million by 2030. The compositional change is also important. In 2000, the Brazilians in the global middle class were split evenly across the eighth and ninth income deciles of their national distribution. By 2030, 75 percent of the members of the global middle class will earn the incomes of the sixth and seventh deciles in Brazil, and no member of that class will earn more than 80 percent of the country's population.

Consistent with these data, by 2030 the middle class, together with the rich, will account for a larger share of the population in a greater number of countries. In 2000, the middle class and the rich exceeded 40 percent of the population in just five developing countries, and these countries were home to 0.8 percent of the population of the developing world. By 2030, the middle class and the rich will exceed 40 percent of population in 34 countries, and these countries will account for 39 percent of the world's developing country population. Therefore, although the ability of the global middle class (together with the rich) to influence policy in many low- and middle-income countries is initially limited by its small size, this group is likely to become a much stronger political force at both the global and national levels by 2030.

**Figure 6 Changes in the proportion of the population belonging to the GMC**



## 5 Policy implications and future research

In measuring social welfare, economists have struggled to provide simple statistics that reflect both changes in average income and its distribution. This paper has used a new tool for assessing changes in global income distribution—the GIDD—to illustrate the trends in these two variables in an *ex ante* framework. According to the data underlying the GIDD, three-quarters of total world income is controlled by only one-quarter of the world population.<sup>14</sup> More importantly, we showed that even in a fairly optimistic scenario – where recent trends of strong growth rates for developing countries continues for the next two decades and, as a result, global inequality is in decline – *within* country income disparities may widen.

This important finding is policy relevant for several reasons. Firstly, the friction between improved convergence of average incomes across countries and widening disparities within them suggests the need to revisit the balance between global and country agendas. Additional multilateral trade liberalization is likely to sustain growth for many developing countries. However, specific groups of people within countries may not be able to adjust to the resulting new wave of globalization and may be left further behind. Worsening inequality can also mute the positive effects of growth on poverty reduction and increase the risk of social alienation of people at the bottom of the distribution. In the end, it may cause counterproductive backlashes against the global liberalization that started the whole process.

One trend that may counter-balance the potential anti-globalization sentiment is the emergence of the global middle class: a group of consumers who demand access to, and have the means to purchase, international goods and service. Our results have shown that the share of these consumers in the global population is likely to more than double in the next 20 years. Even more importantly, the members of the global middle class will

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<sup>14</sup> This statistic is obtained by ordering all countries according to their per capita incomes, from the richest country to the poorest, and then adding up their populations until the resulting group account for 75% of world income. In this way, poor and rich individuals within rich countries are added together to form the final group. When all individuals in the world are ordered according to their incomes and irrespective of their nationality, the threshold of three-quarters of global income is reached by a group that comprises just 20 percent of the world population.

become closer to the median voter in many of today's developing countries, potentially playing a much more important role in domestic policies and supporting further global integration.

At the same time, the emergence of the global middle class will not attenuate rising income inequality, and counterbalancing within country distributional tensions is likely to require specific domestic policies. Governments should be able to design equity-enhancing policies that can also increase efficiency, but at times they may face trade-offs. For instance, raising direct taxes to excessive levels to finance social services, such as education, targeted to the poor may create disincentives and even curb investment. However, in the long run, once access to education has become more equitable, a larger share of the population will be educated; growth should also be higher. These long-term benefits of redistribution should be considered when assessing trade-offs between equity and efficiency. The design and successful implementation of a development strategy that positively reinforces growth and equity objectives is highly country-specific. It will depend, among other things, on countries' initial conditions in terms of equity, institutions, and economic structures. By simulating different scenarios and policies, the data and model framework of this paper represent a first step towards designing these successful development strategies.

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