

Mobility in Latin America: are countries in the region becoming middle class societies?

September 2011

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1. Introduction and motivation

This paper addresses some key questions: what would happen to the global income distribution if the recently observed strong expansion of developing countries, including the sustained high growth of China and India continue for the next two decades? Continued growth of developing countries will drive convergence of per-capita incomes at the global level. But will it will also be a key force behind upwards socioeconomic mobility. This mobility is likely to result in the entrance of millions of developing countries consumers into the global middle class—a group of people who can afford, and demand access to, the standards of living previously reserved mainly for the residents of developed countries. This paper will examine these questions at the global level, but it will consider in particular detail the evolution of Latin America, a region that has embraced market friendly reforms but that has until recently been growing at the slowest pace amongst developing countries and that share, together with African countries, the highest levels of initial inequality.

Fast growth of poor countries reduces global poverty and global income disparities. At the same time, fast growth is often characterized by high urbanization rates and growing demand for skills, both of which can result in deteriorations in the distribution of income within countries. These apparently opposing distributional effects highlight the importance of analyzing global disparities taking into account income differences not only between national states but also within them. The definition of global income distribution used in this study captures income differences between all the citizens in the world; we may think of the resulting global inequality as income differences

that would prevail if the world were a single country. The concept of global income distribution becomes increasingly relevant as people's perception regarding their relative position in society is no longer based solely on a national yardstick, but it is influenced by the increased awareness of living standards of people around the world (Milanovic, 2006). On the other hand, within-country distributional changes should not be disregarded since economic policy is still decided and implemented at the national level.

The paper is organized as follows. The next section introduces a novel modeling tool capable of assessing changes in the global income distribution: the Global Income Distribution Dynamics (GIDD) model. This section sketches the methodology, assumptions, and data behind the GIDD. Section 3 presents the macroeconomic results of the baseline scenario. Section 4 presents the micro results, namely the changes in the global income distribution and the changes of the global middle class with special emphasis on Latin America. The final section offers some concluding remarks.

2. Methodology

The empirical analysis in this paper relies on two tools developed at the Development Economic Prospects Group of the World Bank: the LINKAGE global computable general equilibrium (CGE) model and the Global Income Distribution Dynamics (GIDD) microsimulation framework.¹ This global macro-micro model combines a set of price and volume changes from the CGE model with expected changes in demographic structure to create a simulated distribution of income in 2030. We begin with a brief description of the LINKAGE model and then proceed to introduce the GIDD framework and its ability to map macroeconomic outcomes to disaggregated household survey data. A few brief remarks on the limitations and yet usefulness of this approach conclude this section.

¹ For more information see www.worldbank.org/prospects/GIDD

2.1 LINKAGE: a global dynamic multi-sectoral model

The forward-looking scenarios in this paper have been produced with the World Bank's LINKAGE model. At its core, LINKAGE is essentially a neo-classical growth model, with aggregate growth predicated on assumptions regarding the growth of the labor force, savings/investment decisions (and therefore capital accumulation) and productivity. Unlike more simple growth models, however, LINKAGE has considerably more structure (see van der Mensbrugghe (2005) for a detailed description). First, it is multi-sectoral. This allows for more complex productivity dynamics including differentiating productivity growth between agriculture, manufacturing and services and picking up the changing structure of demand (and therefore output) as growth in incomes leads to a relative shift into manufactures and services. Second, it is linked multi-regionally allowing for the influence of openness—via trade and finance—on domestic variables such as output and wages. Third, the LINKAGE model has a more diverse set of productive factors including land and natural resources (in the fossil fuel sectors), and labor is split between unskilled and skilled categories.

The LINKAGE model has a 2001 base year and relies on the Global Trade Analysis Project (GTAP) 6.1 database² to calibrate initial parameters. A scenario is developed by solving for a new equilibrium in each subsequent year through 2030. The growth in the labor force is driven by demographics—essentially given by the growth of the working age population. Differentiated growth of skilled versus unskilled workers is partly driven by demographics and partly driven by changes in education rates. As education levels rise (in the younger populations), they eventually increase relative growth of skilled workers once they enter the labor force (and older unskilled workers retire). Savings decisions are partly driven by demographics—rising as youth dependency ratios fall and falling as elderly dependency ratios rise. Investment rates are driven by changes in growth rates (the accelerator mechanism) and differential rates of return to capital. Net foreign savings is the difference between domestic savings and investment.

² See www.gtap.org for details.

Productivity is derived by a combination of factors, but is also partially judgmental. The baseline assumes a long-term rate of TFP growth in the range of 1.0–1.4 for the high-income countries, towards the high end of the Bosworth and Collins (2003) estimates but consistent with the trends in the 2000s. The range for developing countries is somewhat wider—between 0.7 and 2.9 toward 2015 and declining slowly thereafter. Agricultural productivity is assumed to be factor-neutral and exogenous and is set to estimates from empirical studies (e.g., Martin and Mitra, 1999). Productivity in manufacturing and services is labor-augmenting (Harrod-neutral technical change); it is skill-neutral but sector-biased, with productivity growth higher in manufacturing than in services. Finally, the model assumes that energy efficiency improves autonomously by 1 percent per year in all regions and that international trade costs also decline by 1 percent per year.

2.2 GIDD: linking macroeconomic outcomes to micro survey data

The GIDD is based on micro-simulation methodologies developed in the recent literature, including Bourguignon and Pereira da Silva (2003); Ferreira and Leite (2003, 2004); Chen and Ravallion (2003); and Bussolo, Lay, and van der Mensbrugghe (2006). The starting point is the global income distribution in 2000, assembled with data from household surveys. 1.2 million households are sampled in 63 developing countries, while household information for developed countries comes from the Luxemburg Income Study dataset.³ Detailed survey data for these 84 countries is combined with more aggregate information (usually vintiles) for the remainder of the world; the final sample covers 91 percent of the world population (see Annex 1 for a full detailed list).⁴ The simulated 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.

³ Consumption or expenditure per capita is a more reliable measure than income, and its distribution is normally more equal than the distribution of income. Nevertheless, consumption data are not available for all countries' survey, so, to get a global picture, the study had to include countries from which only income data were available.

⁴ Throughout the paper, when we talk about the global distribution, we are indeed referring to the GIDD's sample covering 91 percent of the world population.

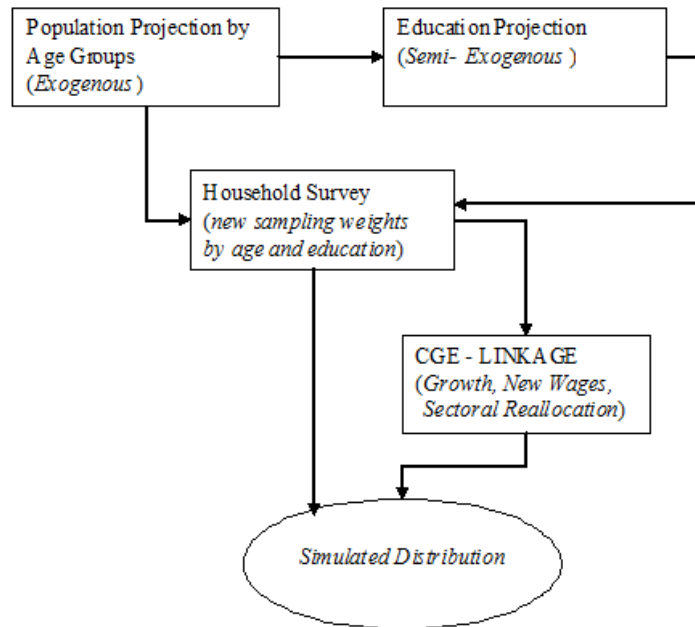
The empirical framework is depicted in Figure 1. Future changes in population shares by age (upper left part of Figure 1) are taken as exogenous from the population projections of the World Bank. Therefore, we assume that fertility decisions and mortality rates are determined outside the model. The change in shares of the population by education groups incorporates the expected demographic changes (linking arrow from top left box to top right box in Figure 1). Next, new sets of population shares by age and education subgroups are computed and household sampling weights are rescaled 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 overall labor supply 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). Finally, the results of the CGE are passed-on to the re-weighted household survey (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. In the first step, total population in each country is expanded until it reaches the World Bank's projections for 2030. The structure of the population is also changed with older age cohorts becoming larger in many countries. To accommodate these changes in the survey data, larger weights are assigned to older people than those assigned to younger individuals.⁵ In the next step, workers move from traditional agricultural sectors to more dynamic industrial and service sectors, and new incomes are estimated for these movers. 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

⁵ Actually weights are not changed for each single individual but for whole households. Therefore, in the example in the text, households whose heads are older are assigned larger weights than households with younger heads. For a complete technical description of this re-weighting procedure, which in addition to the age structure also involves education attainments, see Bussolo, De Hoyos and Medvedev (2010).

the results of the global computable general equilibrium (LINKAGE) model described in the previous Section.

Figure 1: GIDD methodological framework



These sequential changes 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 time invariant. 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 GIDD dataset includes countries for which only income data were available. Finally, measurement errors implicit in purchasing power parity exchange rates, which have been used to convert local currency units, also affect comparability across countries.

2.3 Caveats and limitations

Measuring global income distribution, accounting for the general equilibrium effects of growth patterns and policy changes, predicting the future are all very difficult things to do in economics and they can all be easily criticized. In fact, CGE models are not forecasting tools: growth rates for any specific country or region estimated with the LINKAGE model are subject to a large margin of error. These growth rates depend on *exogenous* assumptions and *endogenous* variables. The most important exogenous assumptions include: (i) the accumulation of factors (employment growth, depreciation) and (ii) productivity changes – which, as mentioned, are partially judgmental. Amongst the *endogenous* mechanisms the most relevant for growth are: (iii) rates of investment (i.e. accumulation of capital) which depend on the availability of savings which, in turn, are a function of demographic factors (dependency rates) and endogenous relative prices of capital goods. There is no consensus on the exogenous values governing (i) and (ii) and on the correct parameterization of the savings function and not even on the parameterization of demand and supply functions for capital goods. It is clear then that the level of uncertainty on the resulting growth rates is quite large. However, the main advantage of a model-based analysis is not of providing exact forecasts, but on having a framework which is consistent with economic theory and that can be used to test and explain the *ceteris paribus* effects of these and many different factors.

Besides, and this is an important point, given our objective of addressing the potential changes in the *distribution* of incomes, a structural model is required. Distribution is affected, amongst other things, by changes in relative factor prices, shifts in sectoral employment, and changes in relative prices of consumption goods. A model that provides only aggregate growth cannot be used for incidence analyses. Thus, even if the robustness of macro-econometric models (normally used for predicting growth rates) can be assessed more easily than that of a CGE model, a macro aggregate model cannot be used to answer the key questions addressed here.

In summary, the macro (LINKAGE) – micro (GIDD) modeling framework used here is easy to criticize. However, if one accepts the premise that the ability to “predict” – obviously subject to great uncertainty – the plausible worldwide distributional implications of large shocks, such as

the emergence of China and India and policy changes in the future, then it is not easy to propose a clearly superior alternative to this.

3. Results

Which middle class?

In this paper, the definition of the middle class is based on absolute levels of real household income per capita, used as a measure of real purchasing power. Members of the middle class are individuals living with more than 10 and less than 50 dollars per day (dollars are expressed in 2005 PPP terms for international comparison purposes). These bounds do not change from 2005 to 2030 since they measure the ability to purchase a given set of goods and services. Anyone with purchasing power within this interval whether in 2005 or in 2030 is a member of the middle class.

These thresholds are appropriate for identifying the middle class' living standards in Latin America and Caribbean. In particular, the lower bound corresponds to the minimum level of income of individuals self-reporting as middle class earner and below which LAC people do not own much physical assets and are vulnerable to poverty. However, this definition may be less relevant for other developing regions. While LAC residents belonging to the 10-50 dollar per day group are earning incomes above the 75th percentile of their national distributions, this same middle class group is primarily composed of the top 5% richest individuals in China, East Asia, South Asia, and Sub-Saharan Africa. As Ravallion (2010) points out, the notion of what the middle class varies with what the standards of livings are: those living with more than \$10 per day may be considered as middle earner by LAC standards, but are likely to be considered as extremely rich by Indian standards. The \$10-\$50 per day definition seems to be closer to what Ravallion (2010) termed "the developing world's upper middle class" for which he calculated a lower bound of income of \$9 a day than to the "the developing world's middle class" which is composed of people living on \$2-13\$ a day according to him [CROSS REF TO THE FLAGSHIP].

The middle class around the World in 2005 and 2030

Individuals earning (or spending)⁶ incomes within the 10 to 50 dollar per day interval, designated as middle class members in the remainder of this paper, represent about 14% of the world population in 2005. Thanks to economic growth, by 2030, this share is projected to surpass 30%. In 2005, one third of the middle class members reside in the developing countries; in 2030 this share will reach more than 80%. This significant shift in the composition of the middle class in favor of low and middle income countries is due to several reasons. The main one is simply demographic and economic growth: since already in 2005 most of the population of developed countries belongs to the \$10-\$50 category, the 2005-2030 income growth shifts automatically this population from the middle to the “upper” class. In the same fashion, income growth in the developing world moves households from the lower class (those living with less than \$10 a day) up to the middle class. In addition, differentials in population growth and economic growth contribute to the observed shift in the middle class composition: from 2005 to 2030 the developing world is projected to grow almost four times as fast as the developed world in terms of income per capita and a little less than three times faster in terms of population. Although demographic factors and economic growth influence each other it is useful to perform a *statistical* decomposition and consider what are the respective contributions of economic growth and population expansion on the changes of the global middle class. Firstly consider a case where income per capita does not change and only population expands over the next decades: the effect on the middle class would be minimal and the developed and developing countries shares of the middle class would be barely modified in favor of the latter by 2030. Conversely, economic growth alone, with no demographic changes, would produce a shift in the middle class composition similar to the observed one.

In the developing world, 313 million individuals are recorded in the middle class in 2005, representing about 6% of the population. By 2030, more than 1.8 billion will be part of the

⁶ The data used in this paper come from the Global Income Distribution Dynamics GIDD database (see www.worldbank.org/prospects/gidd for more information). This dataset comprises data from household surveys for xx countries. Given that not all countries collect both income and expenditure surveys, the GIDD dataset includes countries for which only one type of data is available either expenditures or incomes.

middle class, accounting for a little less than one third of the population. It is worth noting the significant regional differences in the expansion of the middle class. While in the following decades the size of the middle class will barely double in LAC, it will increase by more than 30 times in South Asia, 16 times in China and 6 times in East Asia. As a result, the composition of the developing world's middle class will be deeply altered. Considering only developing countries, in 2005, LAC residents, which represent 10 percent of this group's total population, accounted for 42% of the middle class. By 2030, only 16% of the developing world's middle class will reside in LAC. In comparison, the share of Chinese people will increase from 17% to 53% from 2005 to 2030, and that of South Asian people from less than 1% to more than 6%. To sum up, by 2030, the developing countries' middle class composition will experience large shifts with proportionally less LAC nationals, a bit less residents from Africa, Eastern Europe and Central Asia, many more Chinese and South Asians, and a little more East Asians.

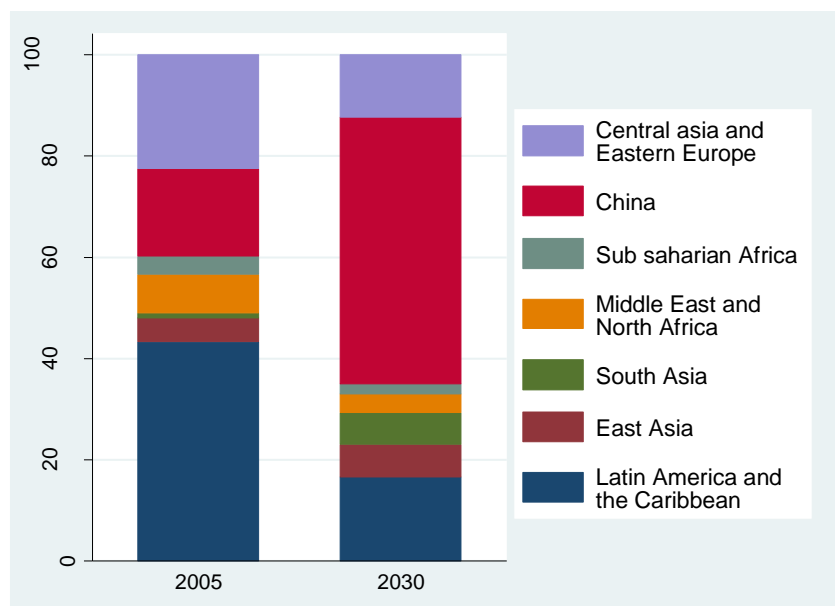
The main determinant of joining the middle class ranks is not population growth but income growth. Although Chinese's population grows more slowly than the developing world average, this region is projected to increase its share of residents in the global Southern middle class by a factor of three, compared with a decline for Africa where demographic forces are the strongest. The difference is due to the fact that per capita income growth in China is forecast to be more than five times the growth in Sub-Saharan Africa, easily offsetting the decline in the former's population share. The comparison of LAC with South Asia is also quite interesting: while the population share in the developing world remain constant for both of these regions, South Asia raised its share of middle class member by seven times while LAC decreased it by more than twice. This can be explained by the fact that South Asia GDP per capita almost tripled during the 2005-2030 period while the LAC GDP increased by only 75%.

Table 1: The global middle class is growing, its composition changing.

Percentage shares

	2005		2030	
	Pop	Income	Pop	Income
World lower class	82.3	25.9	60.1	14.1
World middle class	14.3	40.0	30.4	39.3
High income countries	9.1	29.8	5.8	10.1
Low and middle income countries	5.2	10.2	24.6	29.3
Central asia and Eastern Europe	1.2	2.1	3.1	4.0
China	0.9	1.6	13.1	16.6
East Asia	0.3	0.5	1.6	1.6
South Asia	0.0	0.1	1.6	1.2
Middle East and North Africa	0.4	0.8	0.9	1.0
Sub saharian Africa	0.2	0.4	0.5	0.5
Latin America and the Caribbean	2.2	4.8	3.9	4.4
World upper class	3.4	34.1	9.6	46.6
Total	100	100	100	100

Figure 1: Composition of the middle class across developing countries (percentage shares)



3.2 Focusing on LAC: countries with the largest expansion of the middle class

More than 135 million of LAC residents, almost a quarter (24 percent) of the population, belonged to the middle class in 2005. By 2030, 310 million will be in the middle class and will account for 43 percent of the population. This overall regional improvement conceals noticeable variations across countries and sub-regions. Even in terms of starting points, LAC countries show a high degree of heterogeneity. In 2005, members of the middle class in Argentina and Chile represented more than 35% of their respective populations; in Mexico and Brazil these proportions were at about 25 percent; and, finally in Peru and Venezuela the middle class accounted for less than 15% of total population. In the coming decades, the middle class is expected to expand the most in Peru, Chile, Venezuela and Argentina and the least in Mexico, Brazil and Colombia. In Peru and Venezuela the middle class will triple with respect to the size of the population while it will increase only by a little more than 50% in Mexico and Brazil. As a result, by 2030, the size of the Peruvian middle class relative to its population (50%) will surpass the relative size of the Mexican (43%) and the Brazilian (41%) ones; the Venezuelan middle class will reach the size of the Mexican and Brazilian middle class.

The composition of the LAC middle will have changed quite significantly: although the middle class members will still mainly reside in Brazil and Mexico - since they are the two most populous countries in LAC - they will also live more and more in Peru, Venezuela and the Caribbean and Central America. As figure3 shows, out of 100 Latinos in the middle class in 2005, 37 were Brazilians, 22 were Mexicans, 7 were from Caribbean and Central America, 3 were Peruvians and 3 were Venezuelans. By 2030, still out of 100 middle class members, only 31 will be Brazilians and 19 Mexicans and it will be at least 10 people from Caribbean and Central America, 6 Peruvians and 5 Venezuelans.

Figure 2 : Middle Class as a percentage of population in 2005 and its expansion (in percentage points) over the 2005-2030 period, by country

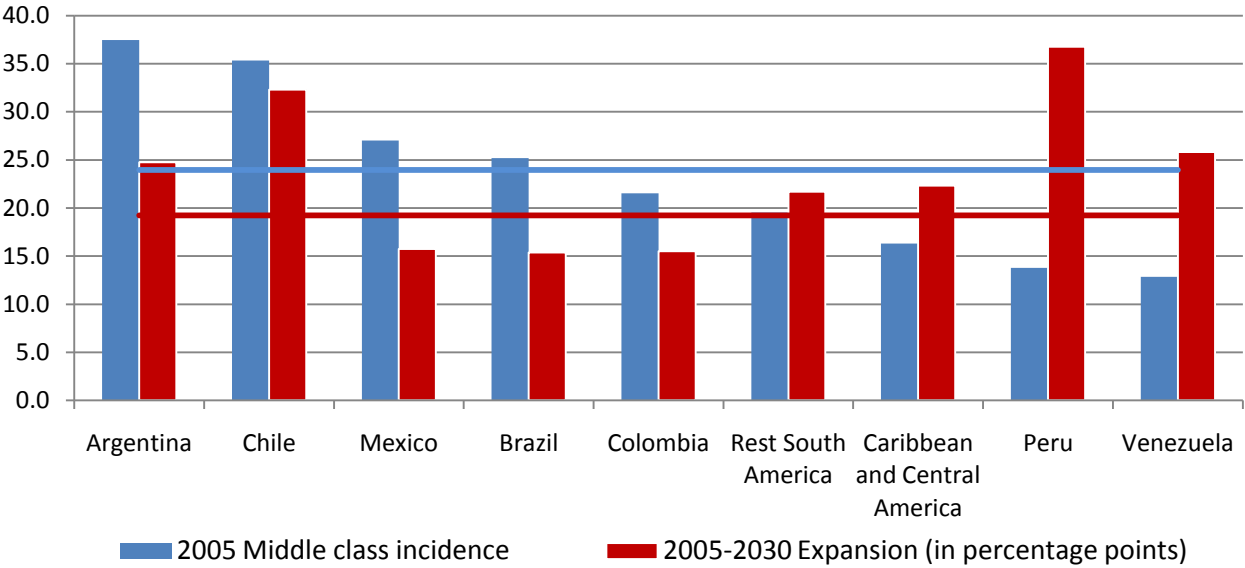
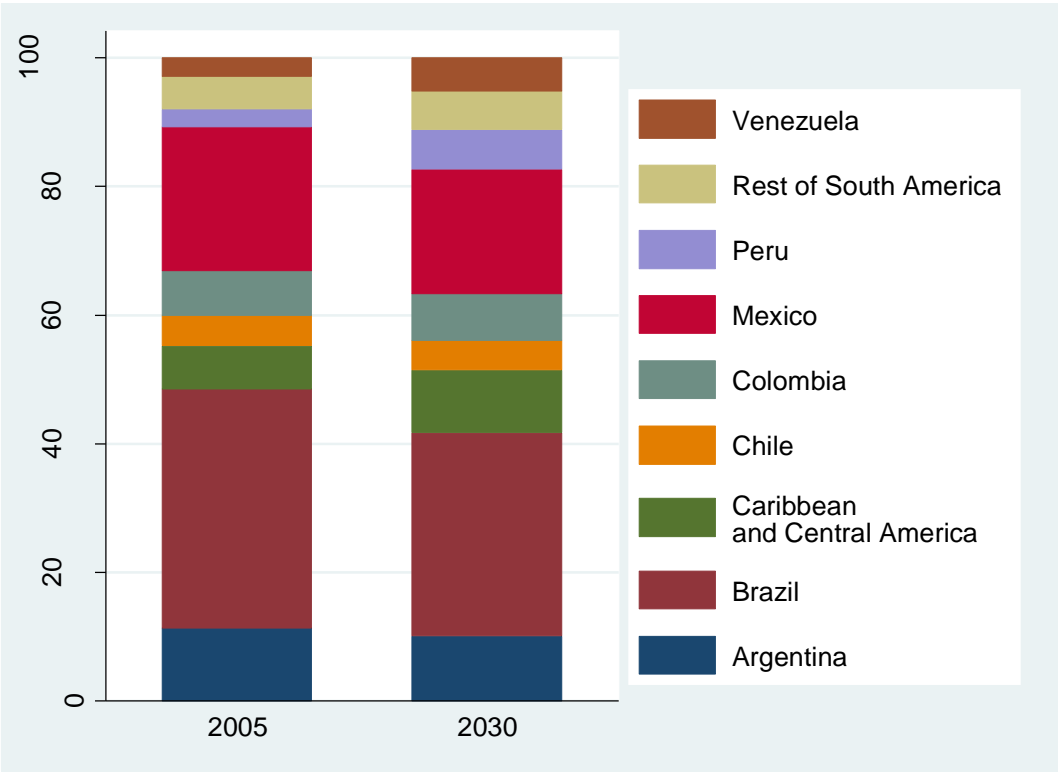


Figure 3: Composition of the middle class across LAC countries (percentage shares)



3.3 Description of the middle class members: characteristics, position within the national distribution.

From the top to the middle of the income scale: the middle class 'earnings position from 2005 to 2030

The members of 2005 middle class in LAC earn incomes well above the averages of their own countries of residence. In other words, being classified as middle class in LAC in 2005 is equivalent to being at the top of the distribution in many countries. For example, in Venezuela and Peru, the households in the middle class are in the top 20 percent of earners within their own countries and the vast majority of those are even in the top 10 percent. Looking at the LAC as a whole, 80% of the middle class occupy the top two deciles of the income distribution. The situation will change quite dramatically by 2030. A full 40% of the LAC middle class will be earnings incomes in the seventh decile or lower at the regional level. Consider the example of Chile, where most of middle class members earned more than 80% of the all Chilean citizens. By 2030, 75% of the middle class members will be evenly distributed across the third and the seventh deciles of their national income distribution, and no member of that class will earn more than 90% of the population. In short, the 2005-2030 economic growth causes a shift in the composition of the middle class from the upper tail to the middle of the income distribution. While only the 20% richest households could afford the global middle class' living standards in 2005, households just above the median income in the distribution will earn enough to enjoy these standards by 2030.

The face of the middle class member in 2005 and 2030.

As is true in 2005, in 2030 most people in the middle class in LAC will have at least a secondary school education (i.e. at least 8 years of education), will work in the urban sectors and will live in a household headed by a male in his forties.

Education and occupation appear to be the two most important factors determining whether an individual will belong to the middle class or not. In LAC in 2005, completing primary education raises the probability of joining the middle class by 15%, staying at school till finishing

the secondary augments this probability by 15 additional points and studying even further till achieving tertiary increases it by 20 points.

Returns to education vary substantially across countries in LAC. Consider, for example, the cases of Luis and Pedro, two young men living in urban areas of Mexico and Peru, respectively. They both have not completed primary education and belong to families living with less than 5 dollars per day. After completing their primary education, Luis's probability of escaping the lower class (defined as living with less than \$10 per day) would be increased by 20 percent while Pedro's chances will rise only by less than 9%. This discrepancy widens in the next grades. For Luis, finishing secondary school brings 16 additional percentage points to the probability of joining the middle class; from secondary achieving tertiary education raises the probability by almost 30 points. Pedro's efforts to complete secondary or tertiary education will not be met with as great reward: the corresponding returns are 6 and 9 points.

The sector of employment of the head of the household is also a crucial characteristic determining the welfare of the household. Rural-urban wage gaps do exist in LAC: everything else being equal, a household headed by someone working in the agricultural sector is about 10% less likely to have middle class' levels of per capita incomes than does a household headed by a worker employed in non agricultural (mainly urban) sectors. Rural-urban premium varies across countries. Would a Brazilian (or Mexican) household working in the field decide to move out and settle down in town, it would raise its chance to join the middle class by 10% (or 15%). Would a Venezuelan household migrate from rural land to town, it would barely affect its income. Additional variables, such as the size of the household and the gender of its head, among others, affect the likelihood of being a middle class member. Everything else being equal, households headed by a woman are less likely (by more than 2 percentage points) to be in the middle class than are households headed by a man. Larger household are also significantly poorer than small ones.

The correlations between poverty and individual or household characteristics change over the forecast period. Rewards of education – in terms of their effect on the likelihood to escape poverty - increase significantly, in all the countries in LAC, and especially in Peru, in Mexico, in Central America and Caribbean and in Venezuela. By 2030, the reward of completing primary education will double with respect to 2005. In Peru, completing secondary school after having

finished primary increased the likelihood of entering the middle class by 6% in 2005; in 2030, it will raise this probability by 22%. Hence, lack of education is likely to become a more important determinant of who is left behind in the next 25 years. By contrast, the sector of occupation will become less important as agricultural wages will approach those generated in the urban sectors. In LAC as a whole, the rural-urban gap in the probability of earning middle class's incomes will halve by 2030 and will even almost disappear in Mexico where the wage premium was initially the largest in 2005. Some countries such as Venezuela, Uruguay, Paraguay, Ecuador and Bolivia will be an exception: the rural-urban income gap will widen and agricultural workers in those countries risk being trapped into poverty.

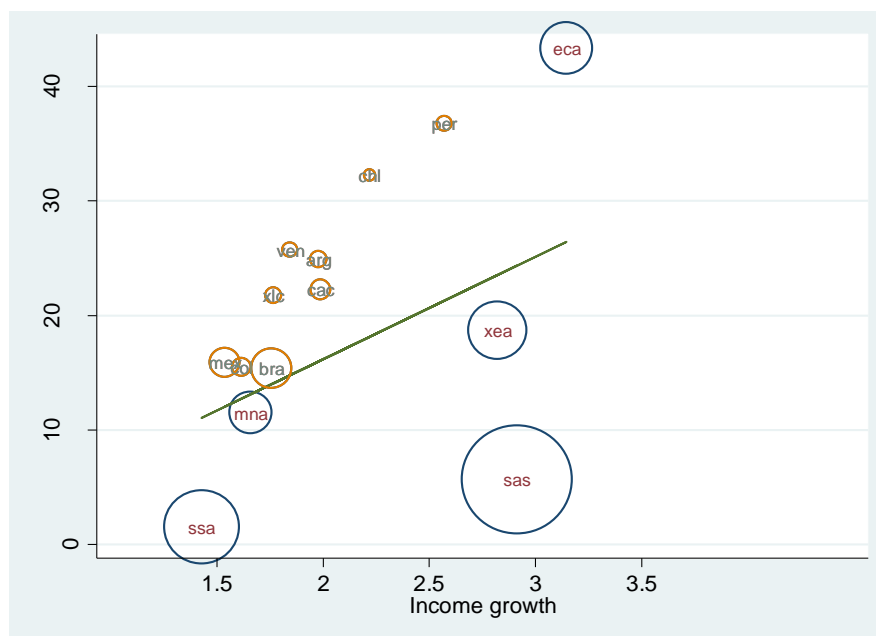
3.4 Determinants of the expansion : demographics vs. economics, growth vs. distributional changes

The expansion of the middle class in LAC results from a combination of different determinants, including: (i) the strength of national per capita income growth, (ii) the distribution of this economic growth, and (iii) the initial inequality level.

Economic growth

The expansion of the middle class is primarily and above all due to income growth at the country level. Countries or regions where economic growth is the strongest are those where the middle class expands the most. The correlation between economic growth and the rise of the middle class (with respect to the population) is strongly positive.

Figure 4: Correlation between expansion of the middle class and income growth

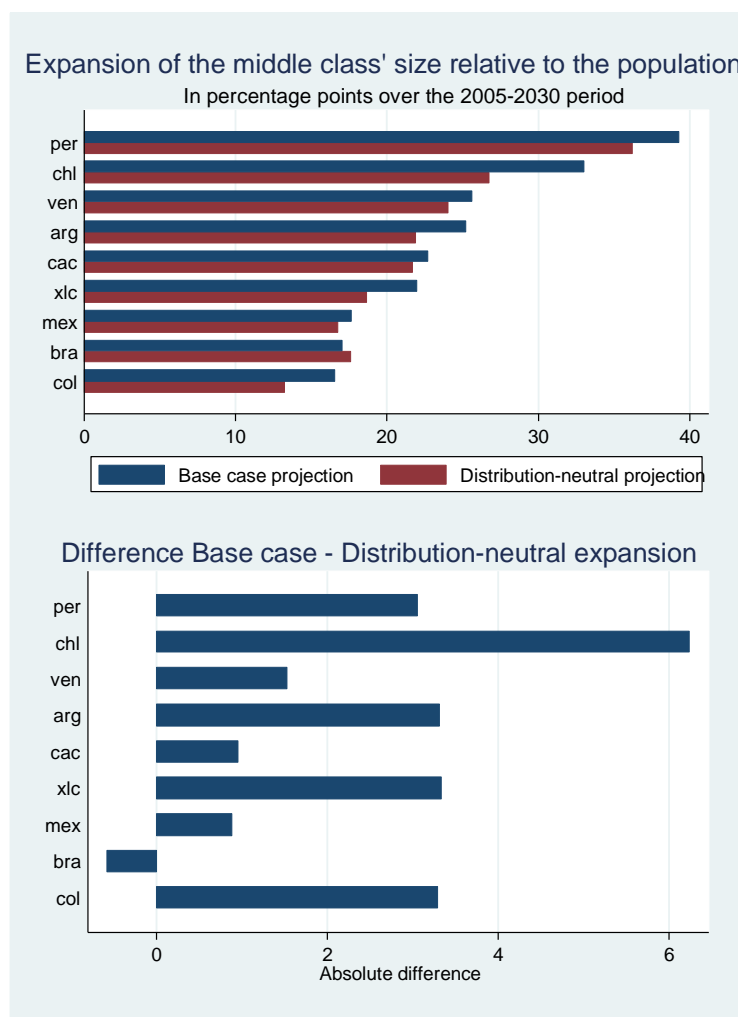


Within-country inequality: how economic growth is distributed?

Changes in the distribution within countries are no less important. Worsening inequality can mute or at least weaken the positive effects of growth on poverty reduction in both the short run (by 2030) and the long term (from 2030 onwards) and can increase the risk of social alienation of people left behind at the bottom of the income scale.

Were rich or middle class member in 2005 the sole beneficiaries of the economic growth over the 2005-2030 period, the middle class would not expand at all. How economic gains are distributed in the income ladder is thus crucial. Whether growth is pro- or anti-poor determines whether a given amount of growth is more or less efficient to lift people out of poverty and move them up into the middle class. Comparing the base case projection to another counterfactual scenario where economic growth is distribution-neutral (i.e shifting the whole distribution rightward without changing its shape) reveals a different pattern of expansion of the middle class across countries in LAC.

Figure 5



In Chile, Argentina and Colombia, growth of the middle class in the base case is greater than that simulated in the distribution-neutral scenario, indicating a progressive growth. Since growth in Chile benefits households at the lower tail of the distribution more than those at the upper tail, the middle class is expected to expand by four percentage points more than it would in a distribution-neutral growth scenario. On the contrary, the Brazilian growth is likely to widen income inequality.

Looking at the Growth Incidence Curve (GIC) confirms the previous remarks and shows a great variation in the distributional effect of economic growth across countries in LAC. The GIC summarizes the distributional effect of income growth by plotting the cumulative share of the population ranked in ascending order of income against the income growth rate of the n th

percentile of the distribution. The latter is calculated by comparing the n th percentile of the initial distribution in 2005 to the one of the final distribution in 2030; hence, when interpreting an upward sloping GIC, it can be inferred that lower percentiles grew slower than upper percentiles and thus that inequality rises. It is important not to conclude that individuals who were at the bottom end of the distribution in 2005 benefited less than those at the higher end of the distribution. This is because an individual, who was in the 10th percentile in 2005, may find himself wealthier in 2030 and in the 55th percentile⁷.

In Brazil, growth has significant un-equalizing effects: incomes of the top two deciles in 2005 will grow by more than 80% while the earnings of the bottom two deciles will rise by only less than 70%. In Peru, it is the reverse: the bottom 20% will experience a more than 180% income growth while the earnings of the top 20% will increase by less than 80%. Different factors drive the dynamic changes of within-country inequality in 2030.

In each country, income distribution is affected by two set of factors: shifts in the demographic structure of the population, in terms of ageing and education attainment, and changes in rewards for individuals' characteristics, such as their education level and sector of employment. Although in reality these demographic and economic shocks occur simultaneously and jointly determine inequality changes, they can be applied each of them sequentially in order to decompose the total change into various components⁸.

As mentioned in the methodology section, this study's view of the demographic structure of the world in 2030 is based on the World Bank's population projections by age group and a simple model of human capital accumulation that assumes a continuation of the educational trends observed over the 1980–2000 period. Controlling for other factors, both the level and dispersion (inequality) of household income tend to increase with the age and education of the household head. Therefore as the population ages and becomes more educated, the population shares of groups with higher income inequality rise, and one may thus expect to see higher inequality. Figure 6.1 shows how the Growth Incidence Curve would look like in Brazil and Peru

⁷ The only exception to this would be if panel data were used to construct the growth incidence curve.

⁸ This method suffers from path-dependence, but there is no clear better alternative.

if only the demographic structure were to change over the next decades, with no economic adjustment other than growth in the mean income. As the upward sloping curve indicates, it clearly appears that in both Peru and Brazil, as well as in most of the other countries in LAC, changes in demographic structure work to increase income inequality. As shares of older and more skilled workers rise, inequality increases since wage dispersion within these groups tends to be higher.

However, as the population ages and get more educated, the labor supply of older and more skilled workers tend to become less scarce (relative to younger unskilled workers) and the wage premium they initially receive is reduced. This means that in reality, labor market conditions change simultaneously with the demographic structure and contribute in attenuating the inequality increases brought by the latter. In Brazil and Peru, the wage premium between agricultural and non-agricultural sectors is projected to decline over the next decades due partly to rural-urban migration and final demand shifts towards manufacturing and services. Figure 6.2 displays the GIC in Peru and Brazil resulting from a drop in the urban premium among unskilled workers in addition to demographic changes over the 2005-2030 period. Comparing Figure 6.2 with Figure 6.1 reveals how the GIC is modified by a decrease of the rural-urban premium. This decrease in the premium appears to have equalizing effect at the lower half of the income distribution. In Peru, as the downward sloping curve on the left side of the distribution indicates, inequality decrease within the bottom five deciles, while they are only softened in Brazil, as the flat slope of the GIC suggests. However, since this change takes place only for unskilled workers (who earn below-average incomes), while gains for the top deciles remain unchanged, it is unclear whether overall inequality decreases or not.

Narrowing or widening gap in the premium paid for higher skills tends to produce even larger shifts in inequality and generally determines the overall direction of the change in within-inequality. Countries in Latin America are characterized by high initial income inequality and relatively slow growth rates (relative to other developing countries in East and South Asia). This implies a slower transition to a service-oriented economy and lower rates of capital deepening—both of which dampen the growth of the wages of skilled workers, whose labor is a complement to capital and is highly demanded in the service sectors. Since initial wage gaps are high and growth is relatively unskilled-intensive, unskilled wages rise faster than skilled incomes, which

results in a decline of the skill premium. The drop in the skill premium tends naturally to lower inequality, but the order of magnitude of the effect varies substantially across countries. Figure 6.3 displays the final GIC in Brazil and Peru accounting for all the demographic and economic changes that have been simulated. Comparing Figure 6.3 with the previous Figure 6.2 allows singling out the effect of the decrease in the skill premium on the pattern of growth. In Peru, the effect is dramatic: the reduction of the skill premium transforms the regressive pattern of Peruvian growth into a strongly progressive pattern. By 2030, incomes in the bottom two deciles will have grown at least by 40% more than in the top two deciles. Would the skill premium have remained at this 2005 level, incomes in the lower half of the distribution would have grown at least 10% less than those in the top two deciles. By contrast, the decrease in the skill premium in Brazil, although comparable to the Peruvian one (-45% versus -60% in Peru), does not trigger a similar drop in total inequality. Although it does attenuate income dispersion – by looking at Figure 6.2 and then at Figure 6.3 one can notice that the growth differential between the lower and the upper tail diminished thanks to the drop in the premium –, the reduction of the premium does not seem sufficient to counterbalance the un-equalizing effect of demographic forces.

Figure 6.1: Demographics and growth in the mean income

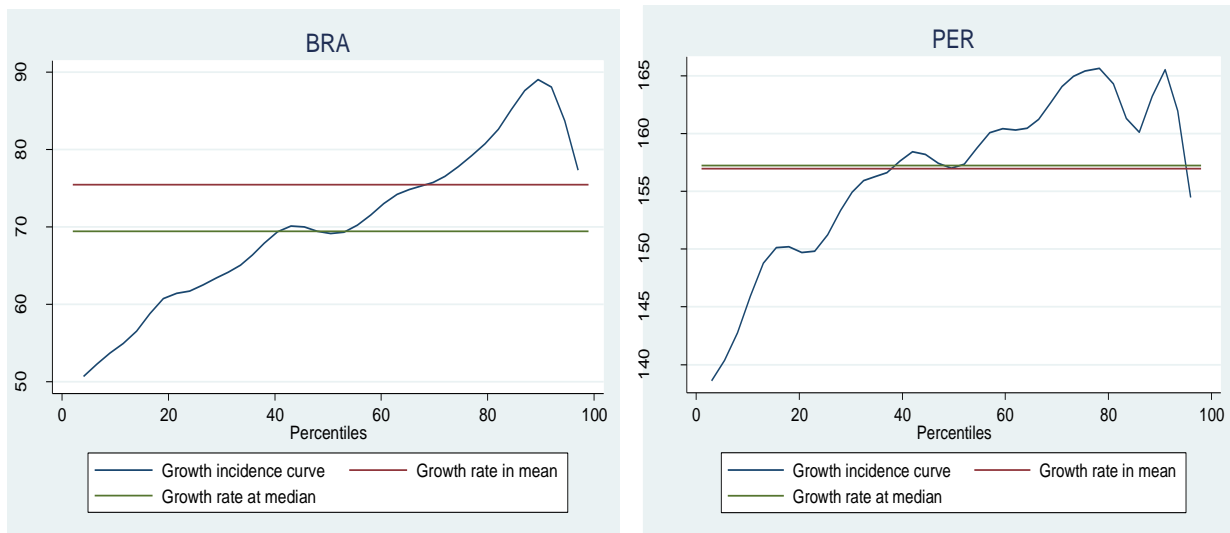


Figure 6.2: Decrease in the rural–urban premium for unskilled workers

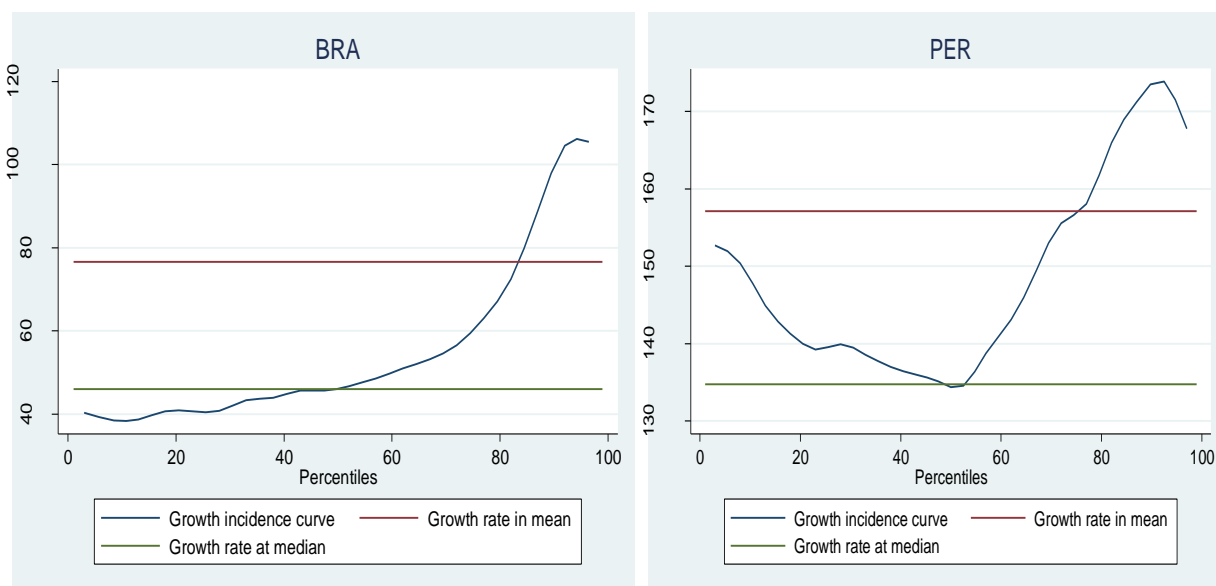
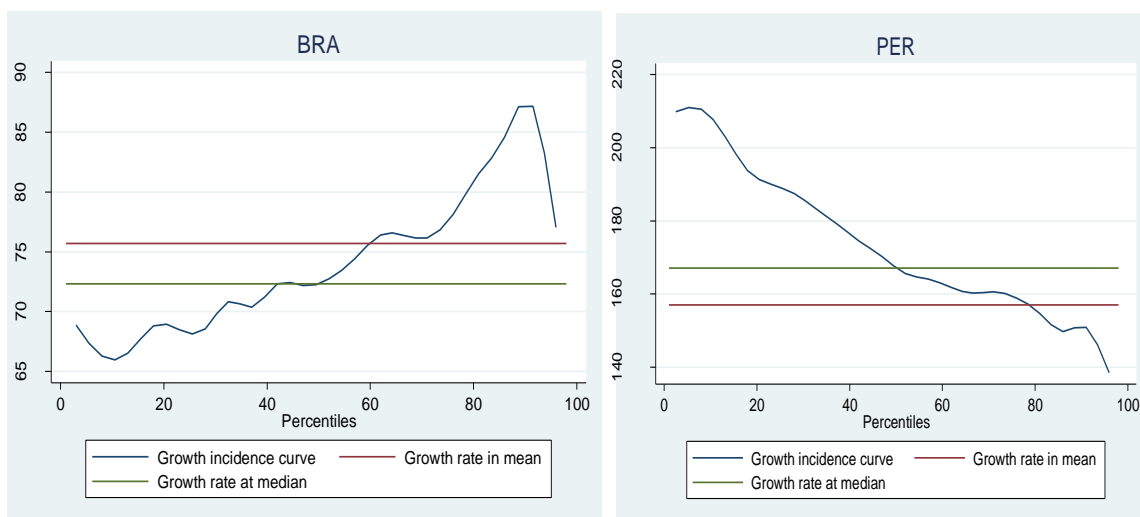


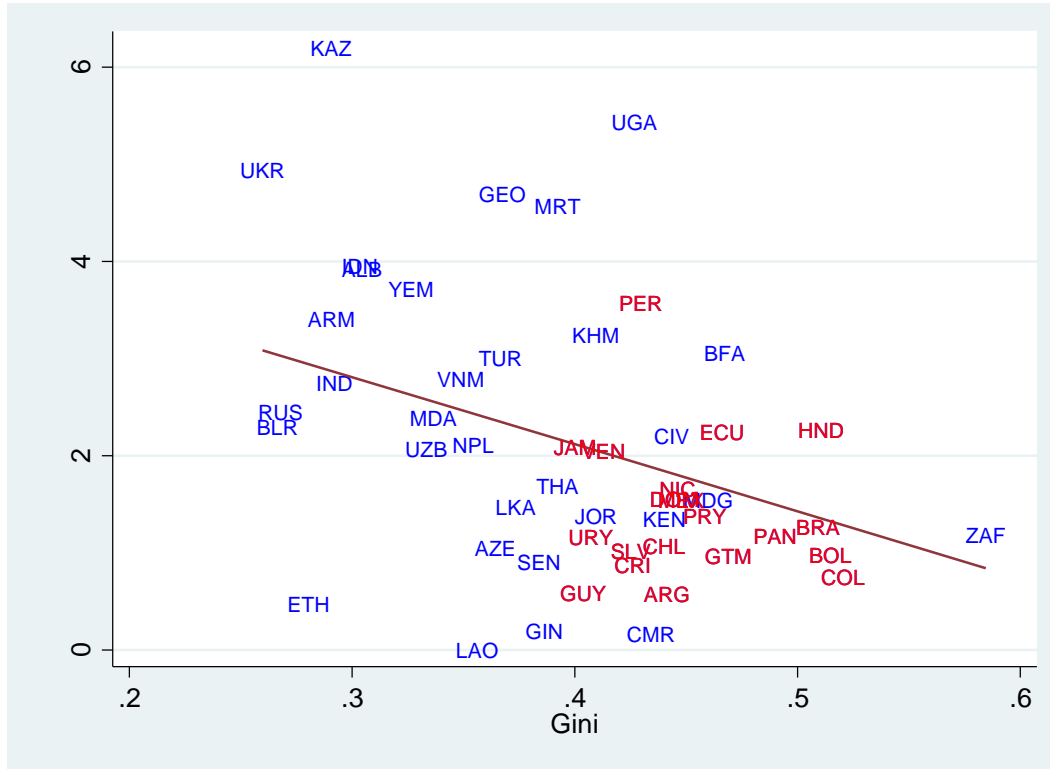
Figure 6.3: Decrease in the unskilled- skilled premium for rural and urban workers.



Countries with high initial inequality will need higher growth rates to see their middle class expand

A progressive growth incidence helps reducing inequality and in boosting a rapid expansion of the middle class. However the *stock*, as opposed to the change, of inequality is also relevant and high initial levels of inequality can hamper the ability of growth of moving the poor

up the ladder of income up to the middle class. This point is illustrated in the figure below, which plots the relationship between the middle class' incidence elasticity of growth and the Gini coefficient for a sample of 84 developing countries. This elasticity has been calculated by simulating a counterfactual income distribution, where the income of each person in a given country rises by 1 percent, and calculating the resulting percentage change in the size of the middle class relative to the population. The results show that there is a robust negative relationship between the level of initial income inequality and the absolute value of the elasticity. At low levels of income inequality, a 1 percent increase in per capita growth generates a more than proportional change in the middle class headcount. However, as inequality rises to the high levels of Colombia or Bolivia, the ability of growth to reduce poverty approaches zero. Hence, the projected rise in inequality in Brazil and Mexico would imply that in 2030 the middle class' incidence elasticity will be lower and, with more unequal income distribution in 2030, these countries will need higher growth rates than they need today to achieve a given expansion of their middle class. On the contrary, countries such as Bolivia, Colombia, Peru or Chile will reap the long-term benefits of reducing income inequality: with a more equal distribution of income by 2030, their economy will be able to realize greater poverty reduction from future growth.



4. Conclusion

This paper analyses, in an ex-ante fashion using the new macro-micro modeling framework GIDD, the effect of demographic and economic changes over the 2005-2030 period on the income distribution around the world. It focuses especially on the shifts in the middle class' size and composition in Latin America and the Caribbean. Under a baseline scenario based on past economic trends and UN population projection, this new global micro simulation tool GIDD - using a collection of household level surveys covering more than 90% of the world population - is able to generate scenarios for the distributional effects of growth not only between countries but also within countries (with a high degree of heterogeneity). The resulting simulated income distribution should 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.

Results show that, between 2005 and 2030, there will be quite a lot of upwards mobility towards the middle class. In the Latina American and Caribbean (LAC) region this group of people will expand dramatically, almost doubling its size relative to the population. Although the growth of the middle class in LAC is significantly lower than in fast emerging countries such as China or India, where the size of middle class is expected to increase by 10 times at least), it still represent a major improvement in the welfare of a great number of household. Assuming the economy remains roughly on the present growth path, LAC will turn into a true middle class society by 2030, with almost half of its population being part of the middle class. Standards of living previously reserved to the 20% richest households will become affordable to families earning the median income by 2030: economic growth in LAC will go hand in hand with upward socio-economic mobility, helping people climb up the ladder of income from the lower class up to the middle class. Individuals joining the ranks of the middle class are likely to be more and more educated (as rewards of education increases) and working less exclusively in the urban sector but also in the agricultural sector (as urban-rural wage gap shrinks).

Demographic and economic changes display substantial variations across countries and sub-regions in LAC. Mainly due to differential in economic growth, the middle class will expand the most in Peru and Chile (the size of the middle class will treble relative to the population) and the least in Brazil and Colombia (the size of the middle class will increase by 50%). Even more importantly, growth will significantly affect the income distribution within countries. While it has significant un-equalizing effects on the income distribution in some countries such as Brazil, it reduces within inequality in others such as Peru⁹. How income growth is distributed matters for two reasons. First, a more progressive growth pattern is more efficient to lift people out of poverty and move them up into the middle class. Second, unequal growth means a higher level of income inequality by 2030, which by itself hampers the ability of future growth – by 2030 onwards – to reduce poverty and expand the middle class. Thus, unequal growth is detrimental to the development of the middle class both in the short and long run.

⁹ In each country, income distribution is affected by shifts in the demographic structure (age and education) and changes in the reward of individuals' characteristics (education and sector of employment).

Finally, strong mobility towards the middle class may have far-reaching consequences. To mention only one, a significant larger global middle class composed of developing-country nationals will probably exert a stronger influence on international and domestic policy making. As shown in the paper, by 2030 the middle class members in developing countries, and notably in LAC, will constitute a significant share of their home country population, allowing them to have a greater say in the domestic policy arena. Some evidence points to a correlation between rising incomes and a shift in demand towards more globalization supportive policies. Other policy goals such as improved transparency, intensified anticorruption efforts, and demand for a more open society and cleaner environment, are also likely to move to the forefront of the policy agenda with the expansion in the size of the middle class.

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