

The Long-Awaited Rise of the Middle Class in Latin America Is Finally Happening

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Abstract

In many developing countries, the supply of skilled workers is likely to continue to be stronger than demand, and this should drive down the skill premium and reduce inequality. Within the limitations of any exercise based on simulations, this paper finds that the recently observed reduction in inequality in Latin America may continue. Building on counterfactual scenarios projecting economic and demographic (including age and education) growth, the paper also highlights that by 2030 the long-awaited

rise of the middle class in Latin America will be in full swing, as its share will be 43 percent of the total population, twice the value in 2005. This achievement is not guaranteed, as countries with large initial inequalities will have to achieve very high rates of inclusive growth. At the same time, a larger middle class is likely to exert a stronger influence on international and domestic policy making.

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The Long-Awaited Rise of the Middle Class in Latin America Is Finally Happening

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JEL codes: D31, D58, I24, J11

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1. Introduction and motivation

What would happen to the global income distribution if the strong economic expansion of developing countries, including the sustained high growth of China and India, will continue for the next two decades? Per-capita incomes will converge at the global level, but would also a truly *global middle class* composed of millions of developing countries' consumers emerge by 2030? Several papers have looked at the past evolution of global income distribution (Bourguignon and Morrisson 2002; Milanovic, 2002 and 2005; Atkinson and Brandolini, 2010, among others) and a consensus is emerging that distributional shifts have been large, especially between countries, and that a decline in global inequality may be finally in sight (Milanovic, 2013). This literature points at the high growth rates of large and poor countries (such as China and India) as the main factor behind the recent reduction of global inequality while, at the same time, highlighting the widening of within-countries income distributions. Some authors assert that a developing countries' middle class is emerging but it is still vulnerable (Ravallion, 2010). Fewer studies consider what would happen if current trends continue: Hillebrand (2008) contends that unless "broad swaths of the developing world substantially improve their economic performance beyond that experienced in the last 25 years, the global income distribution will soon start to worsen again"; World Bank (2007) warns about potential distributional tensions within countries, but also emphasizes the strong presence of developing country citizens among the future global middle class.

Within a global context, this paper considers in detail the evolution of income distribution in Latin America. This region shares, with Sub-Saharan Africa, the highest levels of initial (within-country) inequality but has witnessed a surge in the pace of its per capita growth, accompanied by a reduction of inequality, since the early 2000s. This has led some – Ferreira et al. (2013), Birdsall (2012), OECD (2010) – to state that a middle class in Latin America may have finally emerged.

Indeed, the simultaneous changes of income levels (i.e. growth) and inequality determine how fast the middle class expands. In this paper, members of the middle class are individuals living with more than 10 and less than 50 dollars per day². Given this definition, growth will mechanically shift people above the lower threshold into the middle class. However, the number of people that cross the line depends crucially on the initial level of inequality and on the incidence of growth, i.e. whether growth is accompanied or not by increasing inequality.

² Dollars are expressed in 2005 Purchasing Power Parity terms for international comparison purposes.

Fast growth is often characterized by high urbanization rates and rising demand for skills, both of which can result in widening of inequality *within* countries and in a potential hindrance of the expansion of the middle class.³ This paper, based on a simulation model, shows that this is not the case. Confirming recent findings, see for example Lustig et al (2013), our results show that skill premia may go down further and thus support the continuation of the observed downward trend for inequality in the region.

More in detail, we build counterfactual scenarios projecting economic and demographic growth to 2030, and detect the following trends. As average incomes rise, consumers will demand more services relative to agricultural or manufacturing goods. This, in turn, implies that the share of services in total output will increase; in Latin America, countries will be registering increases of the share of services in total output in the order of 3 to 10 percentage points. The structural shift towards services leads to an increase in the demand for skilled workers, who are used intensively in the production of services. At the same time, even with the conservative assumption of no improvements in education systems, the average educational attainments will increase. This takes place because, with population growth, younger and more educated cohorts are replacing older less educated ones (Bussolo et. al. 2014). The expansion of skilled workers is projected (with this conservative assumption on education and demographic growth) to be very fast in Sub-Saharan Africa with an average growth of 3.5% over 2005-2030. Among Latin American countries, Chile, Colombia and Peru are expected to experience the fastest growth rates of skilled workers of about 2 percent over the same period. Generally, in the region, the supply of skilled workers increases at a rate at least twice as fast as that of unskilled workers. This rising supply more than counter balances growing demand for skilled workers and skill premia will tend to decrease. In Argentina and Chile the skill premia will be falling at an annual rate of around 1.5 percent, much faster than the rate of decline in the remaining LAC countries (0.5%).

The drop in the skill premium tends naturally to lower inequality, but the order of magnitude of the effect varies substantially across countries, as it also depends on other factors that affect growth incidence patterns. For example in Brazil, projected growth has significant un-equalizing effects: incomes of the top two deciles in 2005 will grow (cumulatively) by more than 80% while the earnings of the bottom two deciles will rise by only less than 70%. In Peru, the opposite happens: the bottom 20 percent will experience an expansion of incomes at a rate above 180%, while earnings of the top 20% will increase by less than 80%.

³ For a thorough discussion of the interaction between technological change and education and its effect on inequality see Goldin and Katz (2008).

The second major finding of this paper, beyond that on the further reduction of skill premia and inequality, is that the long awaited rise of the middle class in Latin America is finally happening. According to the 10-50 dollar a day definition of the middle class adopted here, in 2005 less than a quarter (24 percent) of the Latin American population, around 140 million of people, belonged to the middle class. But, by 2030, 310 million, or close to half of the regional population (43 percent) will be in the middle class. There will be significant heterogeneity across countries: the middle class is expected to expand the most in Peru, Chile, Venezuela and Argentina, but small increases will be observed in Mexico, Brazil and Colombia.

More importantly, due to the equalizing changes of within country distributions, middle class members will not anymore be close to the top of the distribution within their own countries. In 2005 and for the Latin America region as a whole, 80 percent of middle class individuals belonged to the top two deciles of the income distribution. By 2030, 40 percent of the middle class members will be either in the seventh or in a lower decile. Being in the middle class (defined in 10-50 US dollar absolute terms) will also mean being closer to the middle (in relative terms) of the distribution. Latin American countries will look much more as true middle class societies.

This encouraging result is not a *certain* result. In particular, achieving it will be easier for countries with lower initial levels of inequality and progressive growth incidence. But, with inequality close to the high levels of Colombia, growth alone may have a small impact on the expansion of the middle class. Policies that directly contribute to more equity, by means of providing fairer access to productive assets, will be needed and their results may take longer to materialize. After all, it took a few decades for the large education effort to finally impact the skill premium and inequality.

The paper is organized as follows. The next section briefly describes the modeling tools used to assess changes in the global income distribution: the global dynamic computable general equilibrium model Linkage and the Global Income Distribution Dynamics (GIDD) model. It sketches the methodology, assumptions, and data behind the GIDD model. 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.⁴ 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.

2.1 LINKAGE: A global dynamic multi-sectoral 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, 2011) 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 towards manufactures and services. Second, it is a multi-regional model allowing for the influence of openness—via trade and finance—on domestic variables such as output, wages, and productivity, and thus growth. Third, the LINKAGE model has a diverse set of production factors including land and natural resources, and labor is split between unskilled and skilled categories.

In each period t , capital stock is equal to the depreciated capital stock from period $t-1$ augmented with the investment of period t . Investment is driven by savings which, in turn, depend on per capita income growth and the population youth and elderly dependency ratios (the number of persons aged under-15 or over-65 respectively per 100 in the working age population). According to the UN demographic projections the global average youth dependency ratio is expected to decrease from 44 to 35 over 2005-2030. All regions will experience a declining trend with the highest drop recorded in South Asia and Sub-Saharan Africa, with developments in LAC being close to the world average.

While youth dependency ratios decline, elderly dependency ratios increase in all regions. The world average elderly dependency ratio increases from 11 to 18. The highest elderly dependency ratio is typical for the high income countries, where the share of the elderly in working age population increases to 23% in 2050 from 15% in 2005. However the elderly dependency ratio increases rapidly for all regions. Despite being relatively low at 6% in 2005, the elderly dependency ratio in LAC doubles by 2030. In China, the old-age dependency ratio increases from 11 in 2005 to 25 in 2030. The aging of population is likely to affect not only the saving rates and

⁴ For more information see www.worldbank.org/prospects/GIDD

fiscal solvency of the pension system, but it is also likely to lead to a shift in consumer demand toward services (notably health-related).

The version of the LINKAGE model used here has a 2007 base year and relies on the Global Trade Analysis Project (GTAP) 7 database⁵ to calibrate initial parameters. A scenario is developed by solving for a new equilibrium in each subsequent year through 2030. The long term projections rely on assumptions about developments in population, factors of production (capital and labor) and productivity. Population and labor force projections are exogenous and based on the United Nations' population forecast revision from 2008⁶. According to UN projections, the world populations will increase from 6.5 billion in 2005 to 8.3 billion in 2030. The evolution of labor force is assumed to be in line with the growth of working age population- i.e. population between 15 and 64⁷. According to the UN forecast, high income countries and East Central Asia (ECA) will see their labor force declining from 2015 onwards. The labor force in South Asia and Sub-Saharan Africa is expected to increase by 40% or 80%, respectively, over 2005-2030 period. The growth of working age population in Latin America and the Caribbean (LAC) over this period is much slower at 25 percent. From 2015 onwards the Chinese labor force declines at an average annual rate of 0.2% over 2005-2030.⁸

The assumptions on changes of productivity are more complex. Productivity in agriculture 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; it is skill-neutral but sector-biased. In the case of agriculture, productivity growth averages 2.5 percent per annum for all countries. In manufacturing and services changes in productivity are country-specific and based on the past trends. Following the broad findings of Bosworth and Collins (2007) we assume that productivity growth in manufacturing is about 3 percentage points faster than in services.

While the national savings are determined by the growth in per capita income and demographic factors, foreign savings are exogenous in the baseline. We assume that current account imbalances will tend to zero in the long run.

⁵ See www.gtap.org for details.

⁶ The UN has released a new projection in May 2010. There are relatively modest changes with respect to the older projection with the total population in 2050 increasing to 9.31 billion versus 9.15 billion in the 2008 projections.

⁷ This is a simplistic assumption given that the overall labor force participation rates are likely to increase as more women enter the labor force in developing countries or due to the rise in the retirement age in high income countries.

⁸ The slowing of the labor force growth along with ageing population will likely pose a challenge to the continuation of the fast economic growth in China and several other developing countries.

2.2 GIDD: Linking macroeconomic outcomes to micro survey data

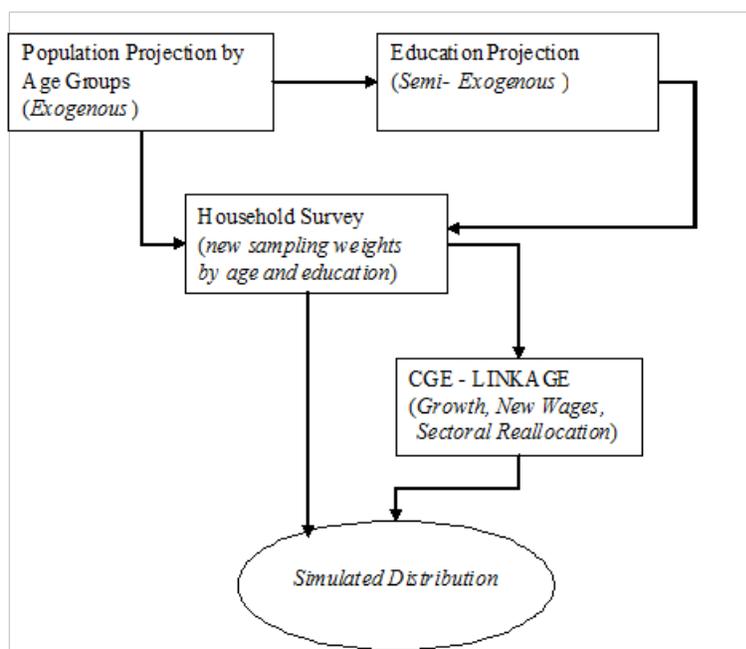
The GIDD is based on micro-simulation methodologies developed in the recent literature, including Bourguignon and Pereira da Silva (2003); Ferreira and Leite (2003, 2004); Chen and Ravallion (2003); and Bussolo, Lay, and van der Mensbrugghe (2006). The starting point for the microsimulations is the global 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.⁹ Detailed survey data is combined with more aggregate information (usually vintiles) for the remainder of the world; the final global sample covers 91 percent of the world population (see Annex 1 for a full detailed list).¹⁰ The simulated 2030 distribution is then obtained by applying three main 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 microsimulation framework is depicted in Figure 1. Projected changes in population shares by age (upper left part of Figure 1) are taken as exogenous from the UN population projections, (fertility decisions and mortality rates are exogenous) . The changes in shares of the population by education groups due to the expected demographic changes are also accounted for (in Figure 1 arrow linking top left box with top right box). Thus, new sets of population shares by age and education subgroups are computed and household sampling weights are rescaled accordingly. In a second step, the demographic changes impact overall labor supply by age and skill groups. These changes are incorporated into the CGE model that is used to simulate overall economic growth, growth in relative incomes by education groups and sector reallocation of labor (link between the middle and bottom rectangles). The results of the CGE are finally passed-on to the re-weighted household survey (bottom link in Figure 1).

⁹ 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.

¹⁰ 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.

Figure 1: GIDD methodological framework



Source: Bussolo, De Hoyos and Medvedev (2010)

In the real world, these changes take place simultaneously, but in the GIDD simplified framework they are accommodated in a sequential fashion. In the first step, total population in each country is expanded until it reaches the UN’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.¹¹ 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 the results of the global computable general equilibrium (LINKAGE) model.

¹¹ 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).

2.3 Caveats and limitations

The changes described in Figure 1 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 levels of inequality. 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 also 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.

The results of the CGE model are also affected by some caveats and growth rates for any specific country or region estimated with LINKAGE are subject to a large margin of error. These growth rates depend on *exogenous* assumptions, the most important of which include: (i) accumulation of factors (employment growth, depreciation of capital) and (ii) productivity changes – which, as mentioned, are partially judgmental. Among 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. 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. This framework can then be used to test and explain the *ceteris paribus* effects of changes in growth rates and factor rewards on global inequality and thus address the key questions of this paper.

Besides, and this is an important point, given our objective of addressing the changes in the *distribution* of incomes, a structural model is required. Distribution is affected, among 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 assess distributional shifts.

In summary, the macro (LINKAGE) – micro (GIDD) modeling framework used here is easy to criticize. However, if one accepts the usefulness of “predicting” – obviously subject to great uncertainty – the plausible worldwide distributional shifts in the next two decades, then it is not easy to propose a clearly superior alternative.

3. The World Economy in 2030

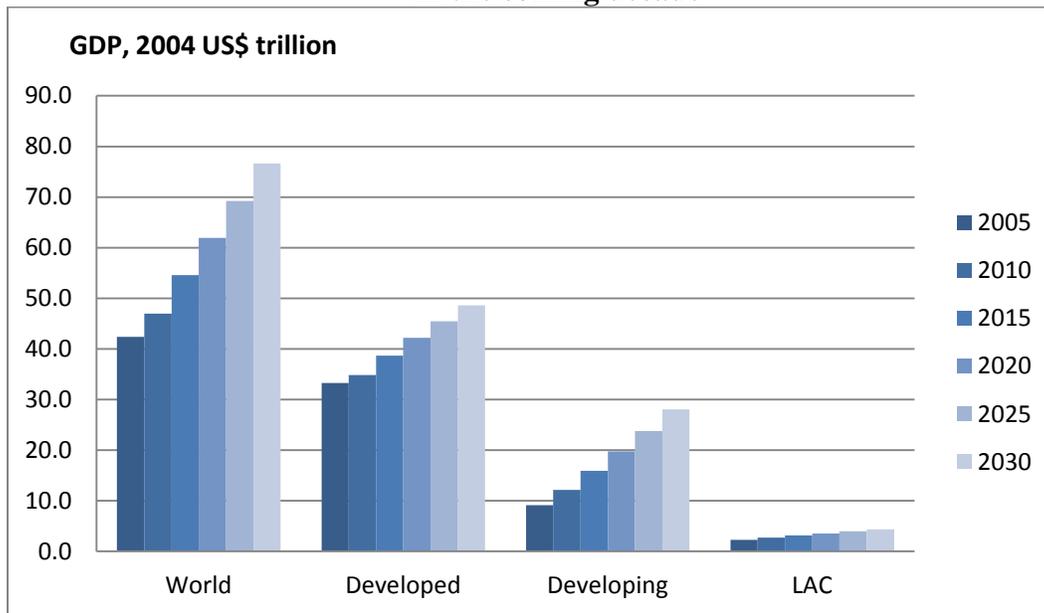
3.1 Global economic growth and convergence

The baseline scenario assumes the continuation of past trends in productivity growth and no major policy changes and projects an average annual growth rate for global GDP of 2.4 percent between 2005 and 2030.¹² Measured at constant 2004 prices, the global economy would reach \$76.6 trillion in 2030, up from \$42.4 trillion in 2005 (a cumulative increase of almost 2 times, see Figure 2). The developing-country GDP would jump from \$9.1 trillion to \$28 trillion, increasing its global share of output from 22 percent to 37 percent.¹³ The early 2000s saw an acceleration of growth in developing countries from 3.2 percent per year between 1980–2000 to 5 percent per year between 2000 and 2005. China has played a major role in the quickening pace of growth in the developing world. The baseline scenario envisions a slight slowing of this recent performance due to aging and shrinking labor force and switching of production towards services with relatively lower productivity growth. Nevertheless, China is still likely to account for 24 percent of growth in global output and 44 percent of growth in output of low and middle income countries up to 2030. The GDP of the LAC region is expected to almost double in size and its share of the world economy is expected to increase slightly from 5.3% in 2005 to 5.7% in 2030. However, with a projected average annual growth of 2.7% (Figure 7) countries in LAC will account for a decreasing share of the income of developing countries i.e. a drop from 25% in 2005 to 16% in 2030.

¹² This represents a modest acceleration of what was observed between 1980 and 2005. For high-income countries, projected growth rates decrease substantially (from 2.0 to 1.5) but a more significant acceleration is attributed to developing countries (from 2.4 to 4.6).

¹³ Evaluated at 2004 market exchange rates and constant prices. Economic growth in developing countries would normally be associated with rising real exchange rates so that the weight of these countries in the global economy will actually be measurably higher in value terms than in constant price volume terms.

Figure 2: Developing countries will account for a larger portion of world output in the coming decade



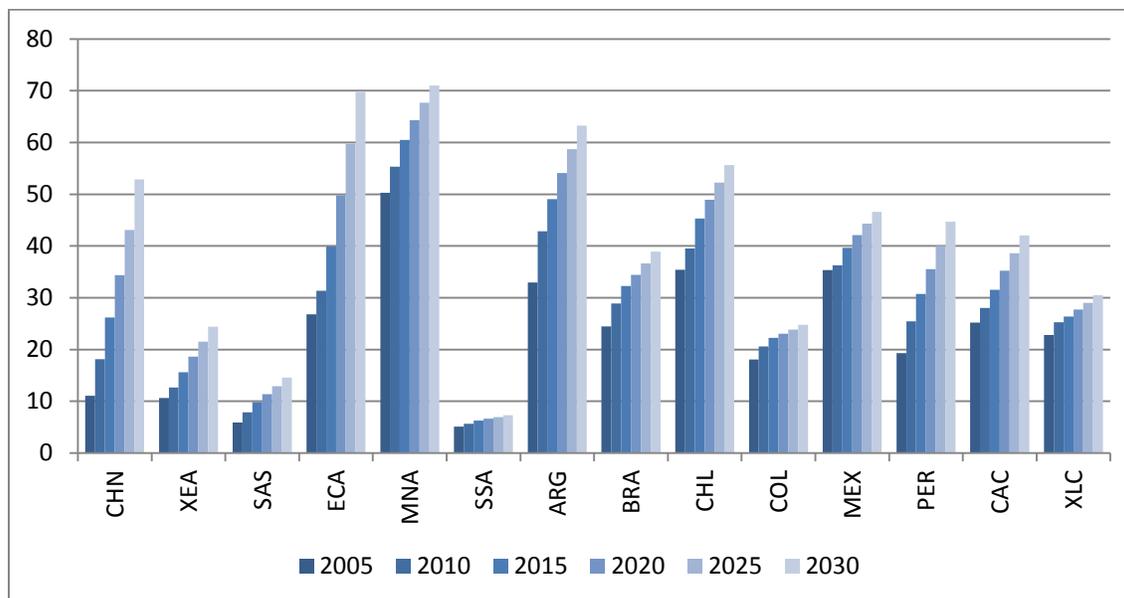
Source: World Bank simulations using the Linkage model.

In the baseline growth scenario and using 2004 PPP exchange rates¹⁴, the speed of convergence between developing- and developed-country incomes would be rather slow and varying significantly across regions. In 2004, the average developing-country resident receives about 14 percent of the average income of a resident of high income countries—\$4,460 versus \$31,400 (see Figure 3). This ratio would rise to 25 percent in 2030. The convergence would be particularly modest in Sub-Saharan Africa. Chinese incomes would rise much faster, from 11 percent of the average high income level to 53 percent, achieving an average income close to the lower range of today’s poorest high-income countries. Latin America would also see a noticeable convergence with the developed countries. Countries such as Argentina or Chile are expected to reach income levels of over half of the high income average, while citizens of Mexico and Peru will be earning on average close to 45 percent of the income of rich countries’ citizens by 2030.

¹⁴ Using the market dollar exchange rate of an economy provides a biased estimate of individual wellbeing because prices differ substantially across economies—particularly for non-traded goods such as personal and housing services. For this reason, it is more appropriate to use the PPP exchange rates, which take into account these differences in prices.

Figure 3: In some developing regions, per capita incomes will begin to converge with those in high-income countries

Index: high-income countries = 100.



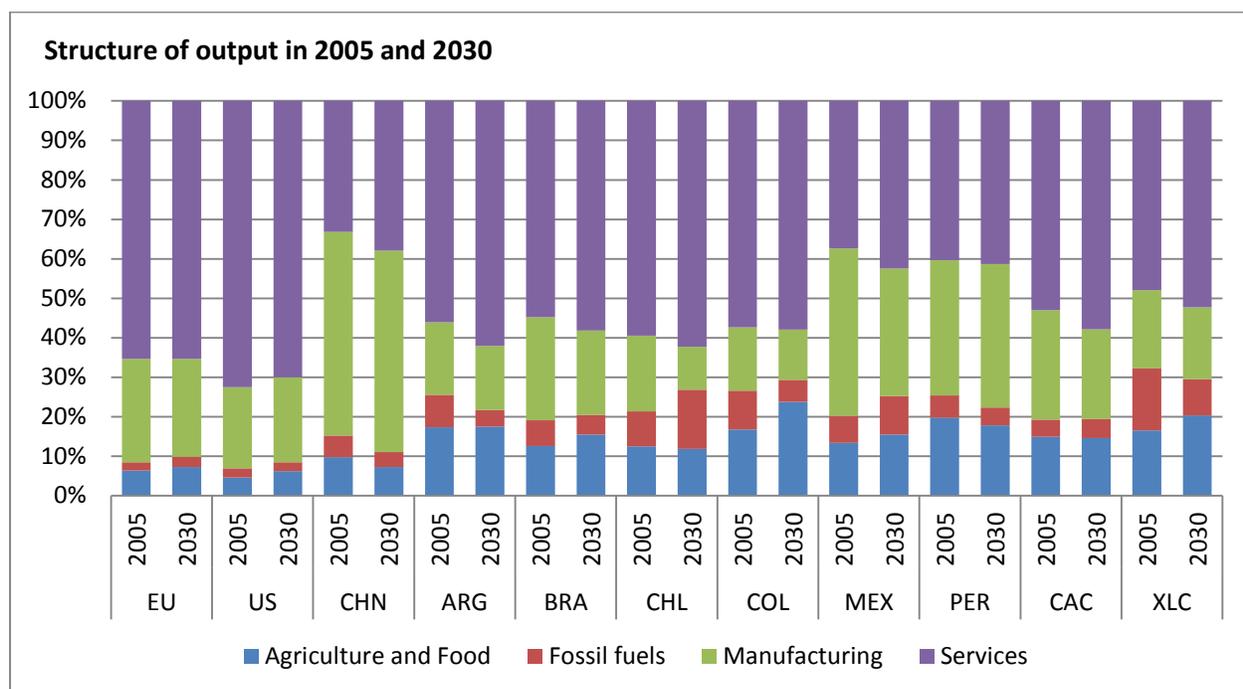
Source: World Bank simulations using the Linkage model.

Notes: Ratio of PPP-adjusted per capita incomes relative to high-income average, PPP is fixed at 2004 level.

3.2 Structural change

As average incomes of developing countries converge to OECD levels, richer consumers in developing countries will demand more services (income elasticity of demand for services is greater than one). At the same time, a slower productivity growth in services relative to manufacturing by rising costs and prices of services more rapidly than those of manufacturing, will contribute to the growing value share of services in total output. The increase in prices and demand for services in low and middle income countries, combined with the sustained demand for health and public services by the aging OECD populations, is likely to translate into a pronounced shift of production towards service activities at a global level (see Figure 4). The share of services will increase by 5 percentage points in China from 33% to 38%, while in LAC, it will increase between 3.5 percentage points and 9.6 percentage points in Central America and the Caribbean (CAC) over 2005-2030.

Figure 4: Shift into services in developing countries



Source: World Bank simulations using the Linkage model.

Notes: Top line represents 2030 shares, bottom line - 2005 shares of sectors in total national/regional output.

ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

The growing share of services will be associated with a falling contribution of other sectors, mainly agriculture. China's agricultural output share is likely to decrease by more than one-half. A similar trend can be observed in East and South Asia and ECA, where agricultural share of output contracts by a few percentage points. Developments in LAC are more diverse. Agricultural output in countries with a comparative advantage in agriculture, such as Argentina, Brazil and Colombia, is expected to expand. On the other hand in Peru where the productivity growth in manufacturing and services is much faster than in agriculture, the share of relatively uncompetitive agricultural output shrinks.

The structural shift towards services leads to an increase in the demand for skilled workers and could lead to the increase of skilled wage premium and relative income of skilled workers. However, we find that in all countries/regions the fast growth of supply of skilled workers outpaces the growth of demand for their services leading to a decline of their relative wage (or skill premium).

3.3 Skill and urban premia and inequality in Latin America and the Caribbean

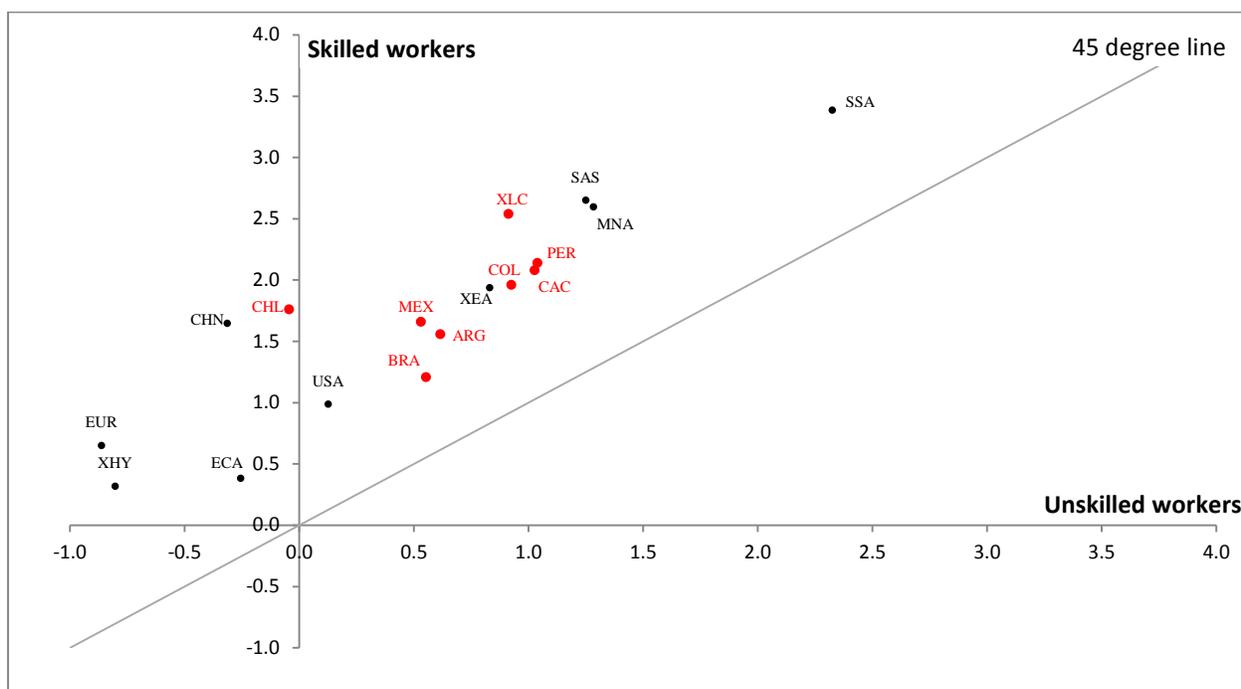
Focusing on recent inequality trends in Latin America, López-Calva and Lustig (2010) conclude that a decrease in the earning gap between skilled and unskilled workers and an increase in the government transfers to the poor were the two main factors behind a decline in inequality in those countries. The reduction of the earnings inequality was in turn the result of the expansion of education since the 1980s and tapering off of the skill-biased technical change that took place in the 1990s. The increasing supply of educated workers was associated with decreasing returns to education. This process of upgrading education is likely to continue in the future.

In fact, assuming that there is no improvement in enrolment and graduation rates in the future (i.e. the average educational attainment of tomorrow's young cohorts equal to the average educational levels of today's young cohorts), the average educational attainment of a country increases through a pure population ageing process in which younger and more educated cohorts replace older less educated cohorts. This simple demographic 'pipeline' effect allows inferring the future growth of skilled workers¹⁵ (see Figure 5) and indicates that the faster growth of supply of skilled workers relative to unskilled workers in Latin America (and other developing regions) will continue.

The expansion of skilled workers is not the same in all countries within the region. It is most pronounced in Chile, where their share of the total labor force is likely to increase by 9 percentage points. In Brazil instead the expected growth of the share of skilled workers will be even slower than in high income countries such as the US. This difference in the expansion of skilled workers is driven by differences in pre-2005 evolution of the educational system. In Chile, where graduation rates have improved over the last couple of decades before 2005, and where the education differential between young cohorts and old cohorts is large, the growth of skilled workers is expected to be fast. Conversely, in Brazil where the performance of the educational system does not seem to have changed much before 2005, as reflected by an almost equal educational achievement of the young and old cohorts, the average educational level of the population is not expected to increase much over the coming years.

¹⁵ Skilled workers are those with 13 years of education or more.

Figure 5: Annual growth rates (%) of skilled and unskilled labor supplies (2005-2030)



Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

The skill premiums for the initial year (2005) along with the main results of CGE simulations for the final year (2030) are presented in Table 1.¹⁶ In 2005 at the level of almost 6 the skill premium in China was the highest among the reported countries/regions. At 4.6 the skill premium in Sub-Saharan Africa was also quite impressive. In Brazil, Colombia, Mexico, Central America and the Caribbean, wages of skilled workers were more than 2.5 times higher than wages of unskilled workers.

Overall, our results indicate that in all regions the skill premium is expected to continue to fall, as growing supply of skilled workers is likely to outpace the growth of demand for skilled workers. The most significant drop in the skill premium is expected in Argentina and Chile, which record a significant increase in the supply of skilled workers only partially attenuated by a relatively significant shift of production towards skilled workers-intensive services.

This study also considers the urban premium defined as a ratio of wages of unskilled workers in urban over rural areas. To understand the evolution of urban premium we divide the national

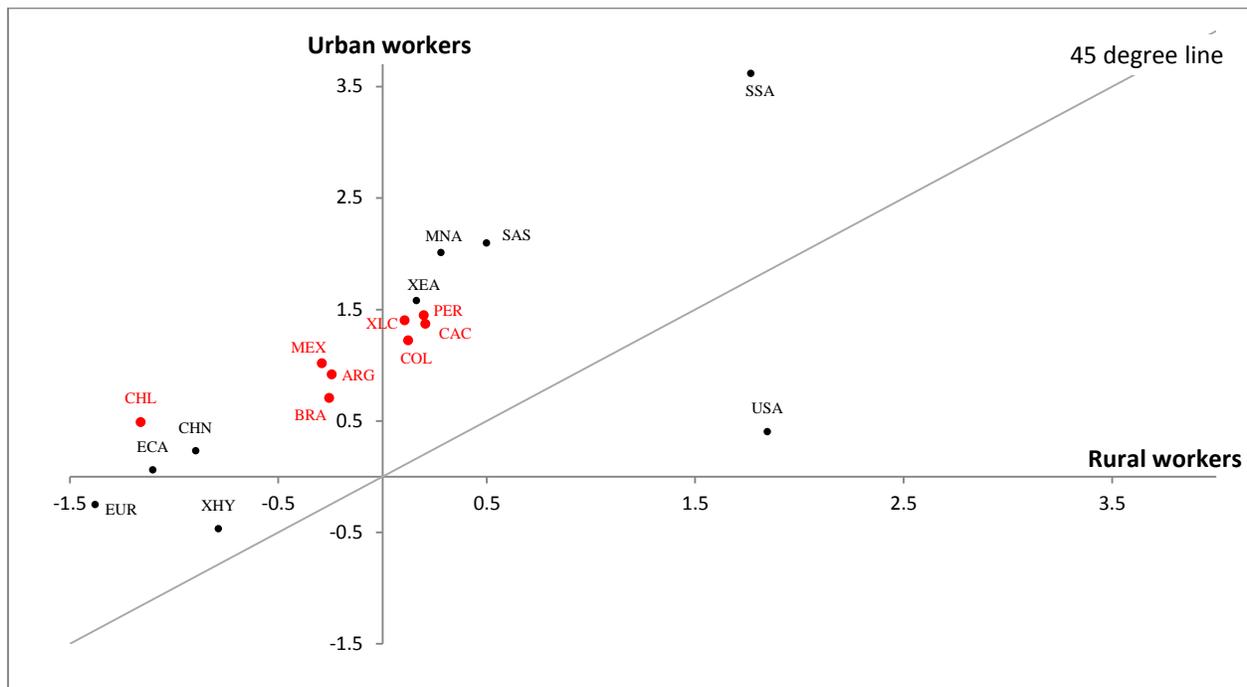
¹⁶ The table also shows urban premium, these are discussed in detail below.

labor market for unskilled workers into two separate geographic zones: rural and urban. The labor market segmentation allows for migration between the two zones and the decision to migrate is a function of the expected relative wages. The separate market-clearing wages are determined in each labor market. Due to the lack of data on the location of sectors across geographic regions within countries, we make a simplifying assumption that rural sector is determined not by geographical location, but by economic activity and that all workers employed in agriculture are located in rural areas. Since the share of skilled workers in the labor force employed in agriculture is very small, we assume that a single economy-wide wage rate clears the labor market in the case of skilled workers.

Urban premium was above 2 in all regions in 2005. The size of urban premium depends on several factors such the extent of segmentation of the labor market in a given country, relative skill intensity of urban employment, the relative growth of urban and rural economies, the ability to substitute between different labor types and the supply of skilled and unskilled workers. In 2005 the urban premium was very high in Sub-Saharan Africa and the Rest of East Asia (over 5), around 3 in the developed countries and significantly lower in LAC. Among Latin American countries urban premium was the highest in Mexico, Peru and Chile. With expanding services sectors in urban areas and the reallocation of workers towards the cities, the growth of employment of unskilled workers in the urban areas will outpace the growth of employment in rural areas.

Indeed our simulations indicate an increasing urbanization as unskilled labor moves to the cities (see Figure 6). The main exception is the USA, where agricultural output expands due to its comparative advantage in agriculture, attracting unskilled labor force into rural areas. The decline in the number of unskilled rural workers is most pronounced in ECA and Europe, as well as in Chile and Mexico among Latin American countries. As a result of fast growth of urban employment, urban premium is expected to fall in almost all regions. The notable exception is MENA, where wages of unskilled workers in urban areas are expected to increase more than in rural areas despite a significant migration of rural population to urban areas.

Figure 6: Annual growth rates (%) of urban and rural labor supplies (2005-2030)



Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

The changes in urban and skill premia can be linked directly to changes in inequality. Inequality will also be determined by other factors such as the rate and structure of economic growth and the initial inequality level. However wages are likely to be a key determinant of inequality, hence the results in Table 1 should provide a good first take on likely changes in inequality. We can anticipate that countries like Argentina, Chile and Mexico are likely to register decline in inequality as both premia decline at a rate above 1 percentage point a year. China and the rest of East Asia also register a significant decline of skill and urban premia and thus their middle class will likely be expanding at a fastest rate among world regions.

Table 1: Baseline scenario – main results

	Real GDP at market price	Urban Premium		Skill premium			
	Average annual % change	2005	2030	Average annual % change	2005	2030	Average annual % change
EUR	1.3	2.9	2.9	0.0	1.5	0.8	-2.3
USA	1.8	2.6	2.6	0.0	1.5	1.1	-1.4
XHY	1.5	3.4	3.4	0.0	1.6	1.0	-1.9
CHN	7.0	1.9	1.1	-2.2	5.9	4.3	-1.3
XEA	4.5	5.6	3.9	-1.4	1.7	1.3	-1.0
SAS	5.0	3.6	3.5	-0.1	3.0	2.4	-0.9
ECA	4.1	2.0	1.3	-1.5	2.4	2.3	-0.1
MNA	3.0	2.9	3.1	0.3	1.4	1.0	-1.4
SSA	3.8	5.5	4.6	-0.7	3.7	2.9	-0.9
ARG	3.5	1.5	1.0	-1.5	2.3	1.6	-1.5
BRA	2.6	1.4	1.0	-1.2	3.1	2.7	-0.5
CHL	2.7	1.7	1.2	-1.4	2.0	1.4	-1.4
COL	2.5	1.3	1.0	-1.2	2.5	2.2	-0.6
MEX	1.9	2.0	1.3	-1.7	2.6	2.3	-0.5
PER	4.6	1.8	1.5	-0.9	1.8	1.5	-0.5
CAC	3.3	1.5	1.2	-0.9	2.5	2.2	-0.6
XLC	2.5	1.2	1.2	0.0	2.4	1.2	-2.5

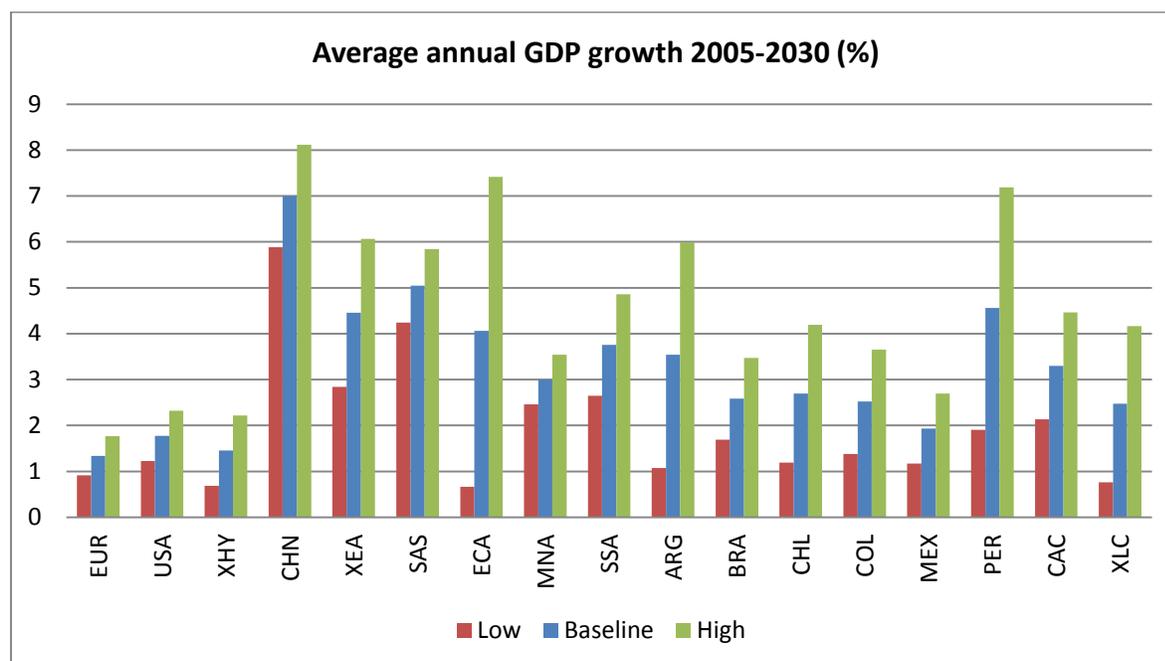
Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

3.4 Alternative economic growth scenarios

The previous section has discussed the mechanisms through which the skill and urban premia changes are linked to structural change, which in turn depends on the rate of income growth and differential productivity growth across sectors. To test how strong are these links and whether our conclusions regarding declining skill premia are sensitive to the economic growth assumption, we perform some robustness checks by varying the rate of economic growth. We consider two alternative scenarios of economic growth and their implications for skill and urban premiums. In these scenarios, we respectively add or subtract a 5-year moving average of the standard deviation of real GDP growth in a respective country/region over 1990-2009 from the baseline growth projections (see Figure 7).

Figure 7: Real GDP growth in baseline, low and high growth scenarios



Source: World Bank staff calculations.

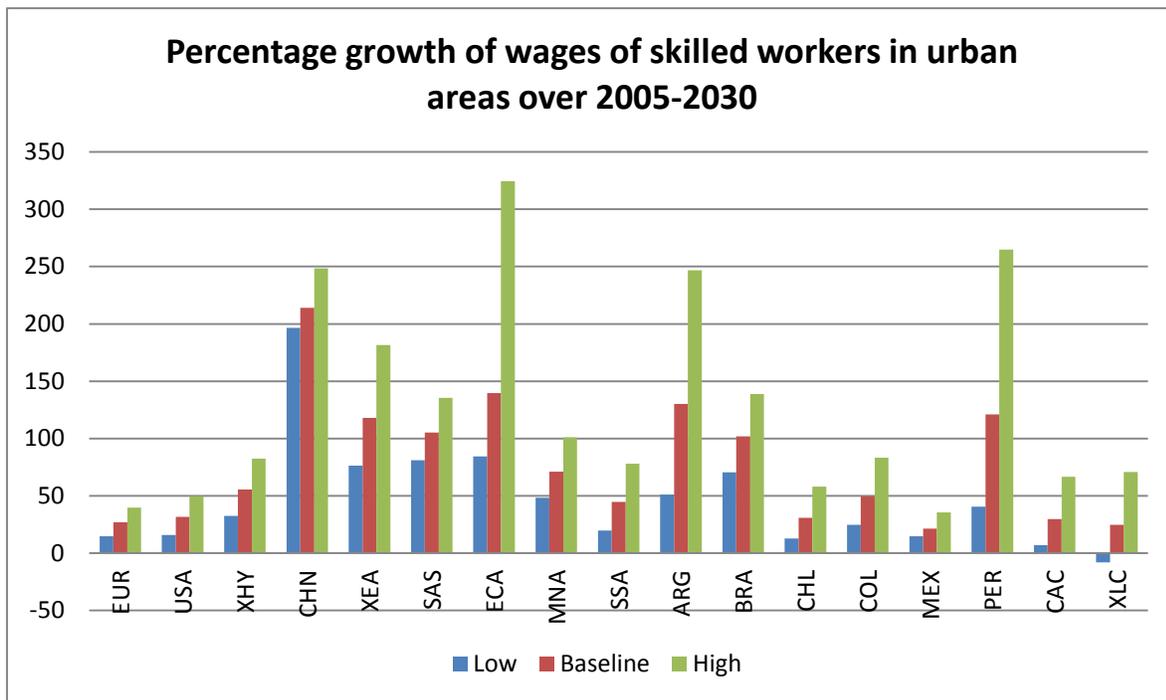
Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

The impact on skill premiums is symmetric around the baseline: we observe the highest drop in the skill premium in the low growth scenario; and the smallest drop of the skill premium in the high growth scenario (with an absolute size of deviation from the baseline being similar in the high and low growth scenarios). In the high growth scenario, the shift towards services is strongest, therefore the demand for skilled workers grows at the faster pace than in the baseline, while the supply of skilled workers (determined by demographics) remains the same. As internal migration from rural to urban areas applies only to unskilled workers and is relatively low, the growth of skilled wages is therefore very high in this scenario, and hence results in the smallest drop in the skill premium. In high income countries, the two alternative growth scenarios result in almost unchanged skill premiums given that the relative growth deviations between the scenarios are rather small. On the other hand, the differences between low and high growth scenarios in developing countries are quite significant, for example around 1 percentage point per annum in Argentina, Chile and the Rest of Latin America. This is associated with significant differences in the growth of wages across scenarios, e.g. in Peru in the low growth scenario wages of skilled workers are expected to increase by 40 percent over 2005-2030 period, while in the high growth scenario their growth is 200 percent or over five times faster.

The urban premium is related to the developments in sectoral composition of output. As an example consider Peru, where in the low growth scenario agricultural sector expands, but it contracts in the baseline and high growth scenarios. In the low growth scenario, urban premium

increases, as the expansion of agricultural sector slows down migration to the cities driving up wages of unskilled workers in urban areas. In the remaining two scenarios, agricultural sector is contracting releasing excess unskilled labor to be used in the fast expanding services sectors. Even though producers have at their disposal a relatively faster growing supply of skilled workers, the urban sector cannot fully substitute away from unskilled workers and its fast expansion is attracting unskilled workers to the cities. In rural areas, a declining agricultural output is produced with ever more shrinking labor force leading to a faster growth of rural wages. As a result, urban premium is falling in the scenarios with faster economic growth and stronger expansion of urban sectors.

Figure 8: Wages of skilled workers under different growth assumptions



Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

Table 2: Skilled and urban premiums in 2005 and 2030 in the baseline, low and high growth scenarios

	Skill premium in urban areas				Urban premium			
	2005	Low	Baseline	High	2005	Low	Baseline	High
EUR	1.5	-2.4	-2.3	-2.4	2.9	0.0	0.0	0.0
USA	1.5	-1.5	-1.4	-1.4	2.6	0.0	0.0	0.0
XHY	1.6	-2.1	-1.9	-1.9	3.4	0.0	0.0	0.0
CHN	5.9	-1.4	-1.3	-1.4	1.9	-1.2	-2.2	-2.7
XEA	1.7	-1.2	-1.0	-1.0	5.6	-0.6	-1.4	-2.0
SAS	3.0	-0.9	-0.9	-1.0	3.6	0.9	-0.1	-1.1
ECA	2.4	-0.2	-0.1	-0.1	2.0	-0.1	-1.5	-2.1
MNA	1.4	-1.4	-1.4	-1.3	2.9	0.9	0.3	-0.3
SSA	3.7	-0.9	-0.9	-0.9	5.5	-0.2	-0.7	-1.0
ARG	2.3	-2.3	-1.5	-1.4	1.5	-0.7	-1.5	-1.6
BRA	3.1	-0.7	-0.5	-0.4	1.4	0.4	-1.2	-1.7
CHL	2.0	-2.0	-1.4	-1.1	1.7	0.9	-1.4	-2.8
COL	2.5	-0.9	-0.6	-0.5	1.3	-0.7	-1.2	-1.3
MEX	2.6	-0.7	-0.5	-0.3	2.0	-0.5	-1.7	-2.5
PER	1.8	-0.5	-0.5	-0.6	1.8	0.3	-0.9	-1.6
CAC	2.5	-0.8	-0.6	-0.7	1.5	0.3	-0.9	-1.5
XLC	2.4	-3.2	-2.5	-2.3	1.2	2.0	0.0	-1.3

Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

4. What happens to the middle class in Latin America and the Caribbean – A global perspective

Which middle class?

In this paper, members of the middle class are individuals living with more than 10 and less than 50 dollars per day (dollars are expressed in 2005 Purchasing Power Parity terms for international comparison purposes). These bounds do not change from 2005 to 2030 since they measure the ability to purchase a given basket of goods and services.

This 10 to 50 dollars range is appropriate for identifying the middle class' living standards in Latin America and Caribbean. In fact, the lower bound corresponds to the minimum level of income for individuals who are self-reporting as middle class earner; note also that individuals with incomes below 10 dollars a day usually do not own 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, the same 10-50 dollar 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 who belongs to the middle class varies. People 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.

The middle class around the world in 2005 and 2030

According to the \$10-\$50 per day definition, middle class members 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 demographic and economic growth. Since most of the population of developed countries belongs to the \$10-\$50 category already in 2005, projected 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. 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 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 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. The composition of the developing world’s middle class will also be deeply altered. 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.

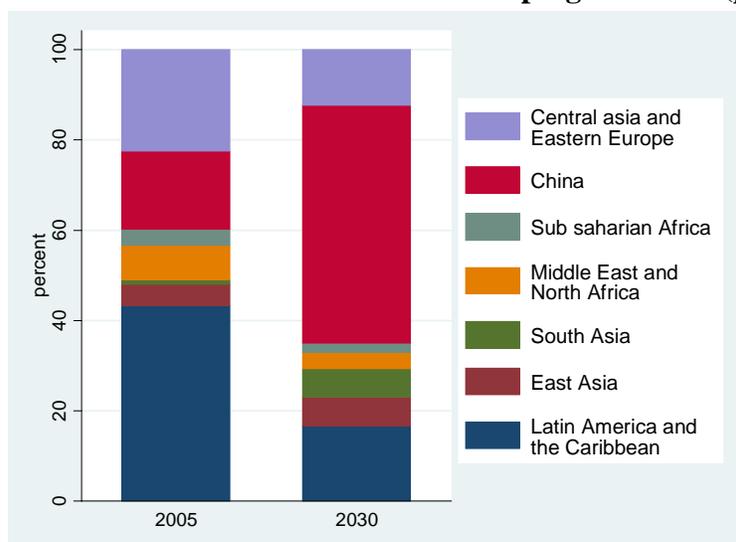
Table 3: The global middle class is growing, its composition changing (percentage shares)

	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

Source: World Bank staff calculations.

These results are 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 is expected to raise its share of middle class member by seven times while LAC is expected to decrease it more than twice. This can be explained by the fact that South Asia GDP per capita almost could triple during the 2005-2030 period while the LAC GDP increases by only 75%.

Figure 9: Composition of the middle class across developing countries (percentage shares)

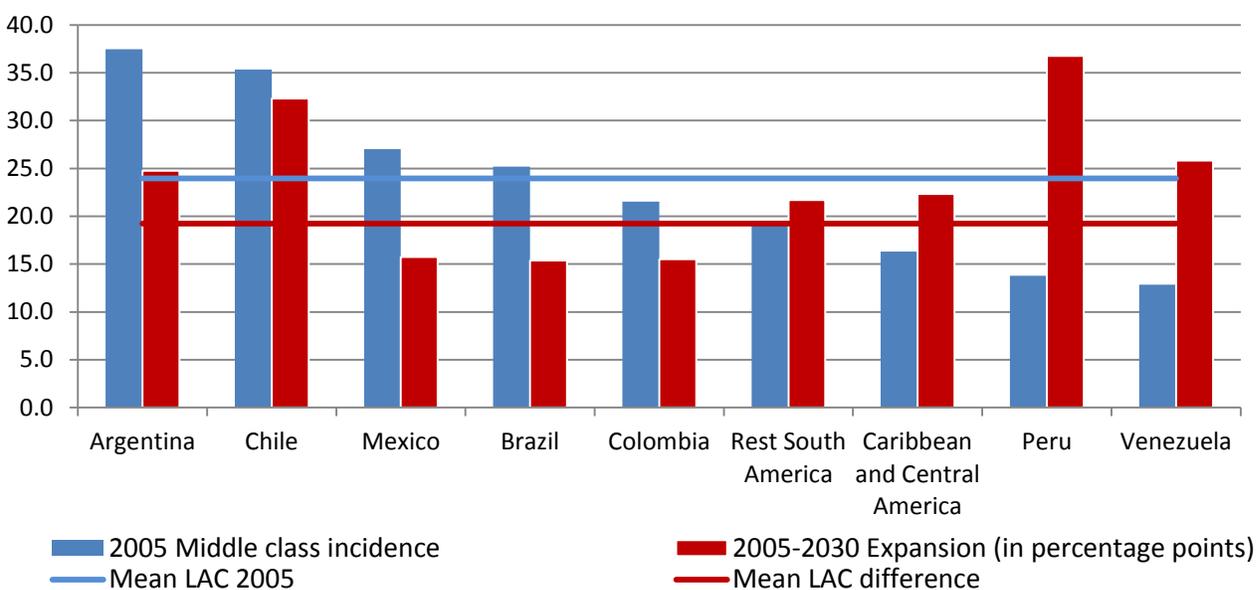


Source: World Bank staff calculations.

4.1 Focusing on Latin America: Countries with the largest expansion of the middle class

More than 135 million of LAC residents, almost a quarter (24 percent) of the population, belong 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 triplicate, 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.

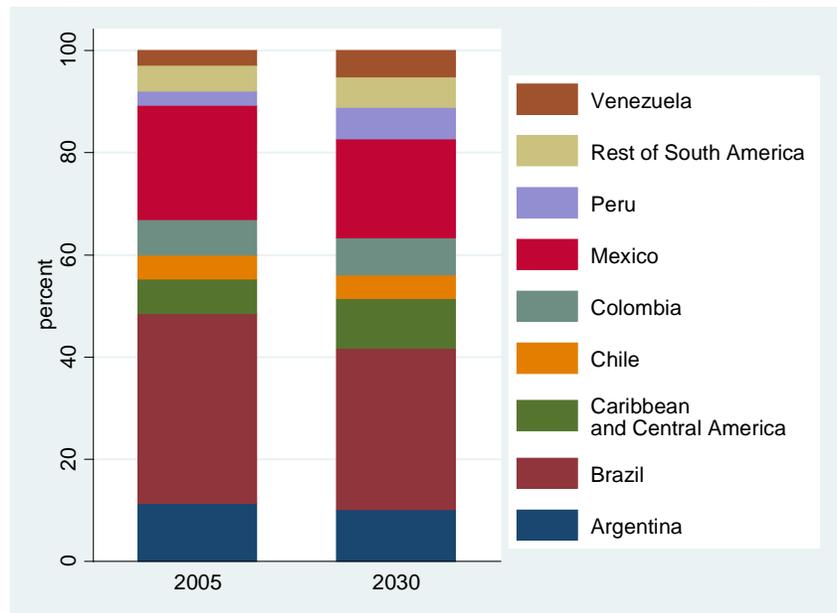
Figure 10: Middle Class as a percentage of population in 2005 and its expansion (in percentage points) over the 2005-2030 period, by country



Source: World Bank staff calculations.

The country composition of the LAC middle class will have also changed quite significantly. As Figure 11 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 11: Composition of the middle class across LAC countries (percentage shares)



Source: World Bank staff calculations.

4.2 Description of the members of the middle class: Characteristics and 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. For example, in Venezuela and Peru, households in the middle class are in the top 20 percent of the income scale within their own countries and a large majority is even in the top 10 percent. Looking at the region as a whole, most (about 80 percent) of the middle class members occupy the top two deciles of the income distribution. This situation changes dramatically by 2030. A full 40 percent of the middle class will be earning incomes in the seventh decile or lower at the regional level. For example in Chile, most of middle class members belonged to eighth decile or above in 2005, but by 2030, 75 percent 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, while only the 20 percent richest households could afford the global middle class's 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 in 2005 and 2030

As in 2005, most Latin American in the middle class in 2030 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 2005, completing primary education raises the probability of joining the middle class by 15%, completing the secondary education augments this probability by 15 additional percentage points and studying even further till achieving tertiary level increases it by 20 percentage 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 nonagricultural (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 in poverty.

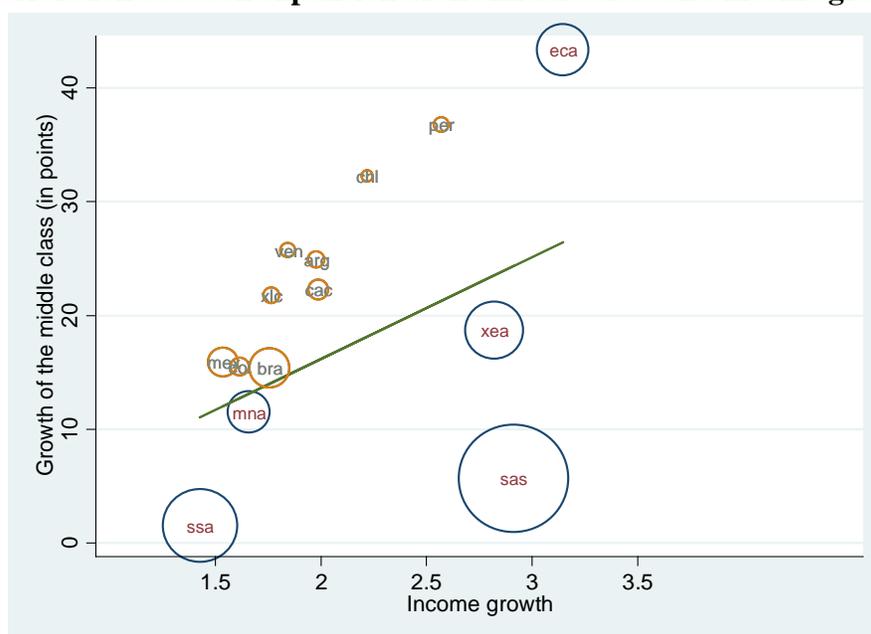
4.3 Determinants of the expansion: Demographics vs. economics, and growth vs. distributional changes

The pace of the expansion of the middle class in Latin America (as well as in other regions) depends on (i) the magnitude of the national rates of per capita income growth, (ii) the incidence of this economic growth, and (iii) the initial inequality levels.

Economic growth

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

Figure 12: Correlation between expansion of the middle class and income growth



Source: World Bank staff calculations.

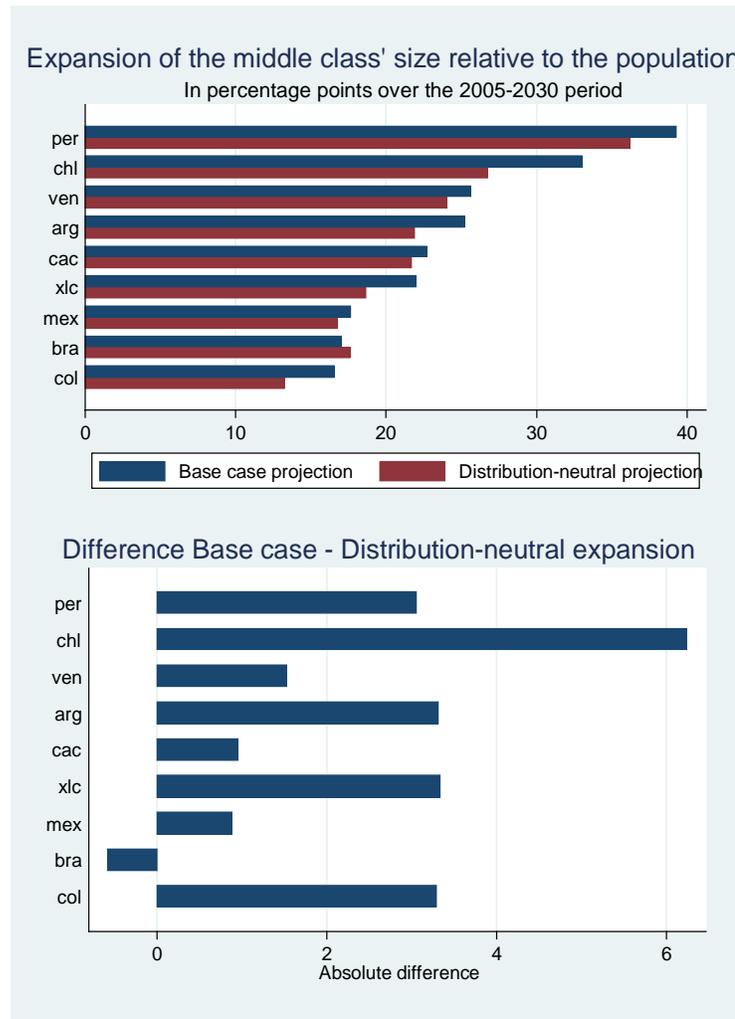
Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

Within-country inequality: How economic growth is distributed

Changes in the distribution within countries are no less important. Worsening inequality can offset – or, at least, weaken – the positive effects of growth on the expansion of the middle class and can increase the risk of social alienation of people left behind at the bottom of the income scale.

In fact, if the rich or middle class member in 2005 were the sole beneficiaries of the economic growth over the 2005-2030 period, the middle class would not expand at all. The incidence of growth 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 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 13: Rising middle class as a share of population.



Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

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 percentile¹⁷.

In Brazil, projected 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, the opposite happens: the bottom 20 percent will experience an expansion of incomes at a rate above 180%, while earnings of the top 20% will increase by less than 80%.

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.¹⁸ A statistical decomposition can be performed to infer how much of the total change can be attributed to each shock.

The demographic structure of the world in 2030 is based on the UN'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 14 shows how the Growth Incidence Curve would look like in Brazil and Peru 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

¹⁷ The only exception to this would be if panel data were used to construct the growth incidence curve.

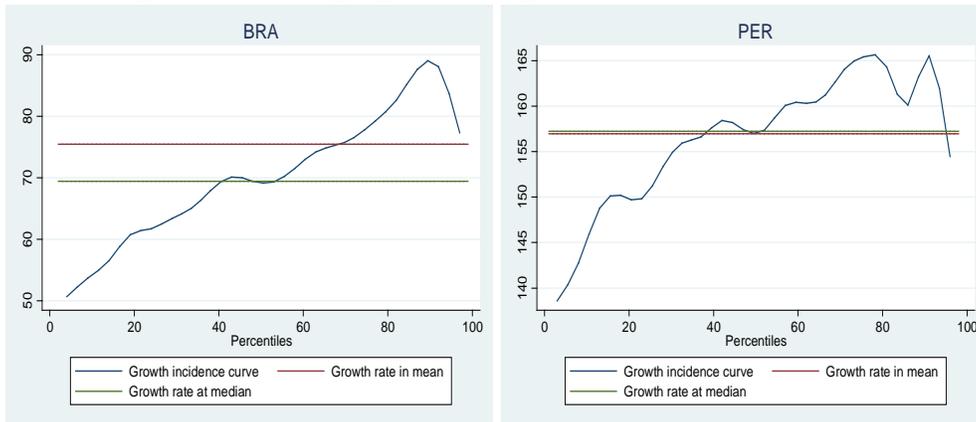
¹⁸ This method suffers from path-dependence, but there is no clear better alternative.

and more skilled workers rise, inequality increases since wage dispersion within these groups tends to be higher.

However, as the population ages and becomes 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 15 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 15 with Figure 14 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.

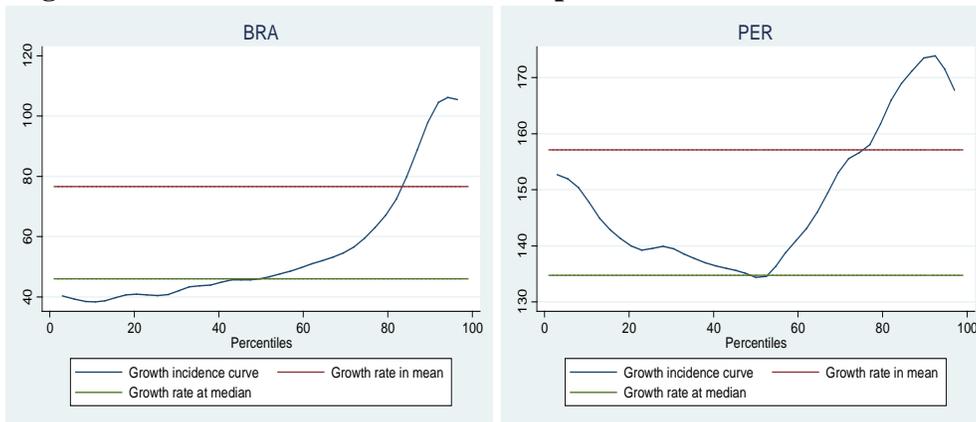
Narrowing or widening gap in the premium paid for higher skills tends to produce even larger shifts in inequality and generally determines the overall direction of the change in within-inequality. Countries in Latin America are characterized by high initial income inequality and relatively slow growth 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, in the presence of a faster growth of supply of skilled workers, 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 16 displays the final GIC in Brazil and Peru accounting for all the demographic and economic changes that have been simulated. Comparing Figure 16 with the previous Figure 15 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.

Figure 14: Demographics and growth in the mean income



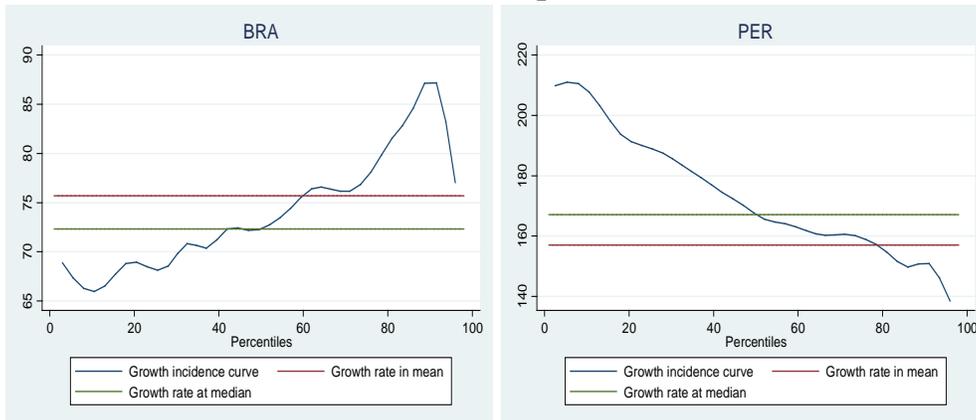
Source: World Bank staff calculations.

Figure 15: Decrease in the rural-urban premium for unskilled workers



Source: World Bank staff calculations.

Figure 16: Decrease in the unskilled- skilled premium for rural and urban workers



Source: World Bank staff calculations.

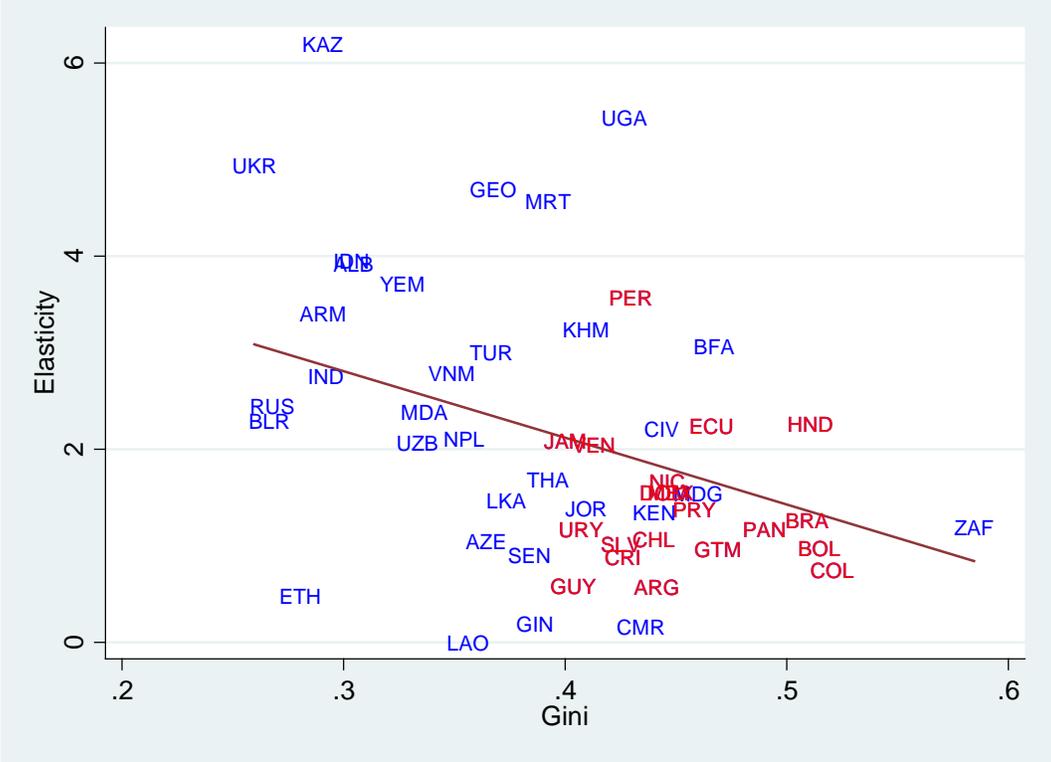
Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

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 (-11.8% versus -12.1% in Peru), does not trigger a similar drop in total inequality. Although it does attenuate income dispersion – by looking at Figure 15 and then at Figure 16, 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 unequalizing effect of demographic forces.

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

A progressive growth incidence helps reducing inequality and boosts the expansion of the middle class. However the *level*, 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 to the middle class. This point is illustrated in the Figure 17 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.

Figure 17: Middle class' incidence elasticity of growth and the Gini coefficient in developing countries.



Source: World Bank staff calculations.

Note: ARG-Argentina, BRA-Brazil, CAC-Central America & Caribbean, CHL-Chile, CHN-China, COL-Colombia, ECA-Europe & Central Asia, EUR-EU27 & EFTA, MEX-Mexico, MNA-Middle East & North Africa, PER-Peru, SAS-South Asia, SSA-Sub-Saharan Africa, USA-United States, XEA-Rest of East Asia, XHY-Rest of high-income, XLC-Rest of Latin America

5. Conclusion

This paper analyses, in an ex-ante fashion using the GIDD macro-micro modeling framework, 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, 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 Latin American and Caribbean 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 households. 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 education becomes more accessible and at the same time the skill premium is reduced) 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 Peru¹⁹. 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.

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

¹⁹ 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).

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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