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America: Argentina, Brazil, Mexico and
Peru**

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The recent decline of inequality in Latin America: Argentina, Brazil, Mexico and Peru^{*}

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Abstract

Between 2000 and 2006, the Gini coefficient declined in 12 of the 17 Latin American countries for which data are available. Why has inequality declined? Have the changes in inequality been driven by market forces such as the demand and supply for labor with different skills? Or have governments become more redistributive than they used to be, and if so, why? This paper attempts to answer these questions by focusing on the determinants of inequality in four countries: Argentina, Brazil, Mexico and Peru. The analysis suggests that the decline in inequality is accounted for by two main factors: (i) a fall in the earnings gap between skilled and low-skilled workers (through both quantity and price effects); and (ii) more progressive government transfers (monetary and in-kind transfers). Demographic factors, such as a change in the proportion of adults (and working adults) per household, have been equalizing but the magnitude of their contribution has been small by comparison. In Brazil, Mexico and Peru, the fall in earnings gap, in turn, is mainly the result of the expansion of basic education over the last couple of decades, which reduced inequality in attainment and made the returns to education curve less steep. It also results from the petering out of the unequalizing effect of skill-biased technical change in the 1990s associated with the opening up of trade and investment. In Argentina, the decline in earnings inequality seems to be associated with government policies that without the windfall of high commodity prices will be hard to sustain.

Keywords: Income inequality, Latin America, wage gap, government transfers.

JEL classification: O15, H53, J48.

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Introduction

Inequality is a distinctive feature of the Latin American region, both due to its high level and persistence. However, after a period of rising inequality in the 1990s, income inequality in the region has been on the decline since the late-1990s and early 2000s (Figure 1). Of the 17 countries for which comparable data are available, 12 experienced a decline in their Gini coefficient between (circa) 2000 and 2006 (Figure 2). The pace of the decline ranges from –3.1 percent a year for Ecuador to –0.2 percent a year for Venezuela; the average decline for the 12 countries is –1.1 percent a year. All the declines except for Venezuela’s are statistically significant.³

The decline in inequality has been widespread. Inequality has fallen in both high inequality countries (Brazil) and low inequality countries⁴ (Argentina); fast growing countries (Chile and Peru), slow growing countries (Brazil and Mexico), and countries recovering from crisis (Argentina); countries with a large indigenous population (Bolivia, Ecuador and Peru) and countries with a low indigenous population (Argentina); in countries governed by the left (Brazil and Chile) and in countries governed by non-leftist regimes (Mexico and Peru); in countries with a universalistic social policy (Argentina and Chile) and in countries with a traditionally exclusionary state (Bolivia and El Salvador). This widespread decline in inequality is remarkable for a region that has witnessed high, persistent levels of inequality. To a large extent, inequality in Latin America is the result of state-capture on the part of predatory elites, capital market imperfections, inequality of opportunities (in particular, in terms of access to good quality education), labor market segmentation, and discrimination against women and non-whites⁵. Hence, the observed fall in inequality is good news both for fairness and for growth.

Why has inequality declined in Latin America? Have the changes in inequality been driven by market forces such as the demand and supply for labor with different skills? Or have governments become more redistributive than they used to be? In particular, are the changes in inequality driven by changes in the distribution of personal characteristics (in particular, in the distribution of educational attainment) or in the returns to those personal characteristics (the steepness in the returns to education, for example)? What caused them to change in turn? Was it increased coverage of basic education, the skill-mix of technological

3. Using the bootstrap method, the changes were found to be significant at a 95 percent level and with 100 replications.

⁴ By “low” we mean low by Latin American standards.

⁵ See, for example, Atal *et al.* (2009); Barros *et al.* (2009); Levy and Walton (2009); De Ferranti *et al.* (2004).

change, macroeconomic conditions or stronger labor unions? Do changes in the coverage and distribution of government transfers account for a significant part of the decline in income inequality? What has been the role of socio-demographic factors such as changes in dependency ratios and labor force participation rates for women?

This paper attempts to answer these questions by focusing on the determinants of changes in income inequality in four countries: Argentina, Brazil, Mexico and Peru.⁶ The analysis is based on a variety of parametric and non-parametric methods to decompose the changes in household income inequality in its proximate factors. This empirical analysis is combined with indirect evidence and historical narratives to delve into the more fundamental determinants of inequality.

The analysis suggests that the decline in inequality is accounted for by two main factors: (i) a fall in the earnings gap between skilled and low-skilled workers (through both *quantity* and *price* effects); and (ii) more progressive government transfers (monetary and in-kind transfers). Demographic factors, such as a change in the proportion of adults (and working adults) per household, have been equalizing but the magnitude of their contribution has been, in general, relatively smaller. In Brazil, Mexico and Peru, the fall in earnings gap, in turn, is mainly the result of the expansion of basic education over the last couple of decades, which reduced inequality in attainment and made the returns to education curve less steep. It also results from the petering out of the unequalizing effect of skill-biased technical change in the 1990s associated with the opening up of trade and investment. In the case of Argentina, the decline in inequality seems to be driven by a pro-union stance on the part of the government and redistributive fiscal policy based on the windfall of high commodity prices.

The upgrading of skills among the poor, however, will eventually face barriers in access to tertiary education—mainly due to the low quality education they receive in previous levels – at which point the decline in inequality is unlikely to continue. In addition, despite the undeniable progress in making public policy more pro-poor, a large share of government spending is neutral or regressive in the distributive sense and the collection of personal income and wealth taxes is relatively low. In order to continue on the path towards more equitable societies, it is crucial that public spending is made more progressive and efforts are redoubled to improve access to quality services (education, in particular) for the poor.

⁶ The paper is a synthesis of the country studies prepared for the UNDP-sponsored project *Markets, the State and the dynamics of inequality in Latin America* coordinated by Luis Felipe Lopez-Calva and Nora Lustig.

The paper is organized as follows. Section 1 presents the trends in inequality and its proximate determinants in Argentina, Brazil, Mexico and Peru. Section 2 includes detailed country narratives that delve into the more fundamental determinants of inequality changes. Section 3 summarizes the main findings. Section 4 presents concluding remarks.

1. Characterizing the recent decline in inequality and its proximate determinants in Argentina, Brazil, Mexico and Peru

The four countries analyzed in this paper can be considered a representative sample (not in the statistical sense, but in terms of their characteristics) of middle-income countries in Latin America. It includes countries that experienced relatively high growth rates (Argentina and Peru) and countries where growth was modest (Brazil and Mexico)⁷; one of the most unequal countries in Latin America (Brazil) (Figure 3); a traditionally low-inequality country, which witnessed the largest increase in inequality in the region over the past three decades (Argentina); three of the largest countries, in terms of population and GDP (Argentina, Brazil and Mexico); two countries where innovative, large-scale conditional cash transfers have been implemented (Brazil and Mexico); one of the countries with a large indigenous population (Peru)⁸; one country with a universalistic social policy (Argentina) and two countries with a dualistic social policy (Brazil and Mexico); and, finally, one country governed by the populist left (Argentina), one country governed by the social democratic left (Brazil), and two countries governed by non-leftist regimes (Mexico and Peru). In spite of such heterogeneity, we will see how these four countries share some common features in terms of what factors determined the decline in inequality.

Table 1 presents the evolution of the four countries' Gini coefficients and the main economic and socio-demographic characteristics for (circa) 2000–2006. Income inequality, as measured by the Gini coefficient, fell by 4 percentage points in Brazil (2001–2006), 3.7 percentage points in Mexico (2000–2006), 3.1 percentage points in Peru (2001–2006) and 2.2 percentage points in (urban) Argentina.⁹ In all four countries, the decline was statistically significant, there was Lorenz dominance and results are broadly robust with respect to the

7. Argentina and Peru enjoyed high GDP per capita growth rates between 2003 and 2006: 7.8 and 5.2 percent a year, respectively. In contrast, in Brazil and Mexico GDP per capita growth was modest, at 2.7 and 2.8 percent a year, respectively. The GDP data is from World Development Indicators (WDI) database, World Bank, January 2009. The GDP per capita growth (annual %) was calculated based on the GDP per capita at purchasing power parity (PPP) prices (constant 2005 international dollars).

8. Based on Maldonado and Rios (2006), in 2001 around 37 percent of Peru's population was indigenous.

9. The declines are statistically significant at the 95 percent level of significance. According to Gasparini and Cruces (2009), trends in urban Argentina are representative of changes for the country as a whole.

choice of income variable (monetary or total income, for example) and inequality measure (entropy measures, for example). It is interesting to note that the four countries share two relevant socio-demographic changes. First, the proportion of working adults as a share of the total number of adults (and total household members) rose in the four countries. This must be linked to the sharp increase in female labor force participation, which rose between 1990 and 2006 by 18.1 percentage points in Mexico, 14.2 in Argentina, 12.0 in Brazil and 5.8 percentage points in Peru.¹⁰ Second, average years of schooling rose faster for the bottom quintile than for the top quintile. In Argentina, Brazil and Mexico, the difference in growth rates in years of schooling led to a narrowing of the difference in average years of schooling between the two quintiles in absolute terms; Mexico showed the fastest decline of this gap. Below we shall explore the importance of these changes for the dynamics of inequality.

Growth incidence curves (GIC) for population deciles and percentiles reveal some interesting patterns (Figure 4). In all four countries, the growth rate of income of the groups at the bottom was higher than the average of the growth rates of all deciles or percentiles. The income of the bottom decile in all four countries, for example, rose at between 14 and 66 percent between (roughly) 2000 and 2006. Almost perfect examples of “pro-poor” growth can be found in Mexico and Peru, with a negative slope of their respective GICs throughout. But, in Argentina and Brazil the bottom decile did not experience the largest increase; furthermore, there is evidence that if you break the 2001–2007 period in Brazil in two, during the period 2004–2007 the income of the bottom 5 percent fell, revealing a disturbing pattern in otherwise pro-poor growth¹¹. In Argentina, income declined for the top 5 percent. In the other three, it rose at below 5 percent. Hence, top incomes did not do well during the 2000s. This last result, however, has to be taken with caution because household surveys do not capture incomes—non-wage incomes in particular-- accurately at the top.¹²

The decline in income inequality in Argentina, Brazil, Mexico and Peru has been significant, both statistically and in order of magnitude. Why did inequality decline in these four countries? There are many different factors that affect the distribution of income over time. The existing evidence suggests that “... the evolution of the distribution of income is the result of many different effects—some of them quite large—which may offset one another in whole or in part.”¹³ A useful way to think about the determinants of inequality is to

¹⁰ ECLAC (2007).

¹¹ Barros et al. (forthcoming).

¹² That can be due to limitations in the representativeness of the sample at the top or non-sampling errors such as under-reporting of incomes at the top, particularly non-wage income.

¹³ Bourguignon, Ferreira & Lustig (2005), pp. 12.

consider the factors that affect the distribution of income at the individual and household level.

Factors that cause the distribution of income to change can be broadly classified into four categories: i. changes in the underlying distribution of physical and financial assets, personal characteristics (that is, the racial, ethnic, age, gender, health and educational make up of the population) and population's location (rural or urban areas, for example); ii. changes in the returns to assets, personal characteristics (in particular, the return to human capital) and location; iii. changes in how people use assets (for example, utilization of arable land) and participate in the labor market (for example, active/inactive, self-employment/wage labor and hours worked); iv. changes in transfers, both private (e.g., remittances) and public (e.g., cash transfers or in-kind transfers). At the household level, changes in the distribution of income will be affected by: i. changes in marriage/couple formation patterns (e.g., assortative matching, single parenthood); ii. changes in consumption patterns; iii. changes in fertility rates, and iv. changes in life expectancy. The last two affect the dependency ratio.

State action can modify the distribution of income through two main channels: (1) directly, through fiscal or budgetary interventions (taxes and transfers) that change disposable income and purchasing power (including indirect taxes and subsidies)¹⁴, and (2) indirectly, through interventions that affect the determinants of market or primary income. Indirect interventions, in turn, can be of two types. Measures that affect economic power and access to assets, through—for example-- transfers (or redistribution) of productive assets (including investments in human capital and land reform) and policies affecting the use of, and returns to, these assets (this includes non-budgetary regulatory interventions, as for example, price controls, minimum wage policies, import or export restrictions, labor market regulations, and anti-trust legislation and competitiveness policies). And, second, government actions that change the distribution of voice and power among different groups in society. Government actions through direct and indirect interventions can affect the level and distribution of assets, returns to those assets, and post-fiscal (after taxes and transfers) incomes.

Which of these factors (and to what extent) were behind the observed decline in inequality in Argentina, Brazil, Mexico and Peru? We try to answer such a complex question with detailed country narratives that integrate econometric analysis and quantitative decomposition exercises with historical and indirect evidence. As we shall see, this rather

14. Fiscal interventions also include general and targeted indirect subsidies and indirect taxes that affect the purchasing power of disposable income.

thorough approach allows us to delve into the more fundamental determinants of the observed changes in income inequality. Before we turn to the country narratives, we shall assess the relative importance of proximate factors in accounting for the changes in the distribution of income in our four countries.

Per capita household income can be written as $y = a.(u.w + o)$. This identity relates changes in per capita household income, y , to its four proximate determinants: (i) changes in the proportion of adults in the household, a ; (ii) changes in the proportion of working adults, u ; and (iii) changes in labor income per working adult in the household, w ; and (iv) changes in household non-labor income per adult, o .¹⁵ (Figure 5) Alejo et al. (2009) apply a non-parametric method proposed by Barros et al. (2006) to decompose the change in inequality in these four proximate determinants for the period 2000-2006. The method consists of decomposing the change in any inequality measure into the contributions from changes in the distribution of the proximate determinants, taken one at a time, plus the contributions from changes in the interaction (correlation) of proximate determinants with each other. The contributions are estimated through a series of sequential counterfactual simulations, which assume that the distribution of the proximate determinant of interest remains the same as in the base year¹⁶.

The results are summarized in Table 2. In the four countries, changes in the ratio of adults were equalizing, albeit the orders of magnitude were smaller by comparison to other factors. With the exception of Peru, changes in labor force participation (the proportion of working adults) were equalizing. This effect was stronger in Argentina. Again with the exception of Peru, changes in the distribution of labor income were equalizing too. In all four countries, changes in the distribution of non-labor income were equalizing. From this straightforward decomposition, we learned that—at the household level—the changes in the distribution of non-labor income were equalizing and in the cases of Peru and Brazil, the contribution of this factor was quite high. However, non-labor income is composed of a wide range of very heterogeneous sources: in particular, returns to capital (rents, interests, dividends, etc.), pensions and private (remittances, for example) and public (conditional cash transfers, for example) transfers. So looking at this factor in the aggregate does not tell us much.

¹⁵ For a detailed description of the methodology see Barros *et al.* (2006).

¹⁶ Note that although this method can be applied using any inequality indicator, the results will vary depending on the indicator. Also, the results will be sensitive to which year is chosen as the base year and the sequence selected to construct the counterfactual simulations.

Each proximate determinant, in turn, is the result of myriad of behavioral and external processes. For example, the first proximate determinant—changes in the proportion of adults in the household— captures the impact of changes in fertility and life expectancy. The second is influenced by decisions to participate in the labor force and the demand for labor. The third and fourth – labor earnings per working adult and household non-labor income per adult– are determined by many factors: for example, market forces and state action affecting the demand for labor by characteristics (education, experience, gender, sector, formal/informal); decisions by individuals (and their parents) to invest in education and other forms of capital, to participate in the labor market and how (wage earner or self-employed, full time or part time), to migrate and to send remittances, and government transfers. In addition, the proximate determinants at the household level are affected by assortative matching. It could be the case, for example, that changes in the distribution of labor income are unequalizing (equalizing) at the household level but not for individual workers. These issues are analyzed in the country narratives that follow.

2. The recent decline in inequality and its fundamental determinants in Argentina, Brazil, Mexico and Peru¹⁷

The decomposition exercise reveals that—in different degrees depending on the country—changes in the distribution of labor (with the exception of Peru) and non-labor income account for a significant share of the decline in overall inequality. In this section we will explore which factors are behind these results. Are the changes in labor income inequality driven by changes in the distribution of personal characteristics (in particular, in the distribution of educational attainment) or in the returns to those personal characteristics (returns to education, for example)? What caused them to change in turn? Was it increased coverage of basic education, the skill-mix of technological change, macroeconomic conditions or stronger labor unions? Do patterns at the household level differ from patterns at the individual workers level? Do changes in the coverage and distribution of government transfers account for a significant part of the decline in non-labor income inequality? Are remittances an equalizing force in the countries where they are important?

¹⁷ This section is based on Gasparini and Cruces (2009) for Argentina, Barros et al. (2009) for Brazil, Esquivel, Lustig and Scott (2009) for Mexico, and Jaramillo and Saavedra (2009) for Peru. These papers were prepared for the UNDP-sponsored project mentioned above.

Argentina

Gasparini and Cruces (2009) show how Argentina, a country well known for its large and educated middle class in the 1960s, has experienced a sharp increase in income inequality between 1960 and the end of the 1990s. Argentina moved from a ‘European’ income distribution towards a ‘Latin American’ level of inequality in thirty years. The Gini coefficient for the distribution of household per capita income in the Greater Buenos Aires (GBA) area, for example, soared from 0.344 in 1974 to 0.487 in 2006¹⁸. The results are significant and robust to several definitions of income.

The authors carry out an episodic analysis of inequality the mid-1970s and the mid-2000s (Figure 6). Most of the analysis focuses on the evolution of inequality between the early 1990s and mid-2000s. This period was characterized by a sharp increase in inequality from 1990 until the beginning of 2000, and a decline in inequality in the aftermath of the 2001/02 macroeconomic crisis. It covers two very different, almost opposite, economic policy regimes. In the 1990s, Argentina went through far reaching market-oriented reforms in a context of weak labor market institutions and limited social protection. In the 2000s, state intervention in the economy became more pervasive, labor market institutions were stronger and social protection schemes redistributed income to unskilled and semi-skilled workers.

Here, we will focus on the analysis of the latest period, in which inequality declined. As mentioned above, following the 2002 crisis and after experiencing a sharp increase, income inequality fell: the Gini coefficient for primary incomes fell from 0.554 in 2002 to 0.493 in 2006. This period was characterized by unprecedentedly high GDP growth of 8 percent a year between 2003 and 2007 and a sharp fall in the unemployment rate from more than 20 percent to 8 percent. However, it should be noted that although inequality fell substantially in relation to the crisis levels, it was not significantly different from its mid/late-1990s levels despite the fact that per capita GDP and employment were higher, labor institutions were stronger, and a massive cash transfer program was implemented.

Based on the results presented in Table 2, we can see that labor market related factors (the decline in inequality in labor income per working adult and the change in the ratio of working adults per total adults in the household) accounted for sixty percent of the observed decline in inequality. Gasparini and Cruces (2009) argue that the fall in inequality could be accounted for by the employment generated by the recovery; the shift in favor of more low-

18. These figures are derived from Argentina’s main official household survey (Encuesta Permanente de Hogares, EPH), which covers the main urban areas of the country. The EPH started in the 1970s as a survey for GBA, which accounts for one third of Argentina’s population, and was gradually extended later to cover all urban areas with more than 100,000 inhabitants, which represent two thirds of the total.

skilled, labor-intensive sectors as a result of the devaluation and the recovery in real wages that followed its overshooting; the rise in the influence of labor unions; and, the fading of the one-time effect of skill-biased technical change that occurred in the 1990s.

The evidence shows that macroeconomic crises in Argentina have been unequalizing. The distribution of primary income worsened quite substantially during the crises. With the exception of the years following the 1995 crisis, however, the effect on inequality tended to be reversed in the post-crisis years. Given the significant reduction in unemployment, it seems safe to presume that the fast recovery of the Argentine economy was a contributing factor to the decline in inequality. In addition, during the 1995 crisis, social spending as a share of total disposable income fell and became less progressive. In contrast, while total social spending as a proportion of disposable income also fell in the 2002 crisis, it became more progressive as the programs targeted at the poor (for example, *Jefes y Jefas de Hogar Desocupados*) were expanded.

Interestingly, the large devaluation of the peso in 2002 had an indirect equalizing impact in terms of post-fiscal income inequality. The devaluation had a negative impact on real wages and a positive effect on rents to land which was compounded by the substantial improvement in terms of trade resulting from the global commodity boom. However, the negative (and unequalizing) effect on real wages was in part compensated by the expansion of progressive export taxes which were used to finance large anti-poverty programs. In addition, the excise duties (or “retenciones”) had an indirect redistributive impact because they kept domestic prices of traded goods below their international level; this was particularly important for food.

The Argentine labor market has been characterized by the presence of strong, industry-wide unions, which played a significant role in shaping the country’s social, economic and political outlook, mainly through their relation with the Peronist party. There is evidence that Union membership and activity diminished significantly from 1991 to 2001. The decline in union activity coincides with reforms such as the privatizations, trade liberalization and price stabilization of the 1990s, which reduced the power of unions through the dissipation of rents from state-owned enterprises, protective tariffs and inflation-induced rents. The decline in union activity during the 1990s coincided with a period of rising wage inequality. The revival of union activism, in contrast, coincided with a period of falling wage inequality after 2002. Since 2002, the government raised the minimum wage, mandated lumpsum increases in wages and promoted collective bargaining. Through export taxes and subsidies, prices of foodstuff and fuels were kept below their market levels. Although the

benefits of these policies leak to the non-poor and create all sorts of inefficiencies, they are equalizing in the short-term.

The authors found that during the 1990s a large factor behind the increase in inequality was the increase in the steepness of returns to education: that is, the labor earnings gap between skilled and low-skilled workers rose. As in other Latin American countries, the increase in the skill premium was associated with the modernization of production and organizational structures. This skill-biased technical change, in turn, was associated with Argentina's trade and investment liberalization. By early 2000s, however, the large-scale technological upgrading was probably coming to an end. Hence, the upward pressure on wages for skilled labor—an unequalizing force-- must have subsided.

Gasparini and Cruces also present estimates of the redistributive impact of government transfers in cash and in kind. The estimates include programs and spending categories financed by general government revenues (as opposed to specific contributions, as in the cases of pensions and health insurance); these include education, health, water, sanitation, poverty alleviation programs, housing, employment policies, and most municipal services. They also include estimates of the redistributive impact of (federal and state) taxes. The results show that the incidence of social spending is mildly progressive (i.e., the post-transfers distribution is more equal) and taxes are somewhat regressive (i.e., the post-taxes distribution is less equal).

Since 2000, state action through fiscal interventions became more progressive. Primarily as a result of export levies, taxes became more progressive. Higher fiscal revenues were used to increase social spending. Social spending also became more progressive with the implementation of large cash transfer programs such as *Jefes y Jefas de Hogar Desocupados* in 2002 (which reached 2 million households in 2003). The latter may be an important factor behind the equalizing contribution of the changes in the distribution of non-labor income.

In sum, the fundamental determinants of the recent decline in inequality in Argentina seem to be mainly associated with political economy factors: a pro-union government that is actively redistributing the windfall from very favorable terms of trade. The sustainability of this policy, however, is doubtful precisely because the expansion of government spending is based on revenues that are subject to volatility. The impact of the global financial crisis on commodity prices, exports and capital flows will provide an opportunity to explore this question empirically.

Brazil

Brazil is known as having one of the highest levels of income inequality in the world. There were years when Brazil's Gini coefficient was equal to 0.63, almost a historical and worldwide record. After a few years with very little change, the Gini coefficient has been falling steadily since 1998. The steepest decline occurred between 2000 and 2007 when Brazil's Gini coefficient declined 4.1 percentage points from 0.593 to 0.552, about 1.3 percent per year¹⁹ (Figure 7). Extreme poverty and moderate poverty also fell between 2001 and 2007 despite the fact that average income growth during the period was modest – of the order of 2.5 percent per year.

Thus, based on the observed trends in poverty and inequality and the GIC's presented above, Brazil's growth pattern could be defined as 'pro-poor' (i.e. the growth of the income of the poor has been higher than the growth of the income of the rich). From 2001 to 2007, the per capita income of the poorest 10 percent grew 7 percent per year, a rate of growth nearly three times the national average (2.5 percent), while that of the richest 10 percent grew only 1.1 percent. Two thirds of the decline in extreme poverty can be attributed to the reduction in inequality. For the same reduction in extreme poverty to be reached through growth, Brazil's overall per capita income would have needed to grow an extra 4 percentage points per year.

Barros, et al. (2009) estimate the role played by public policy and the performance of markets in the evolution of income inequality. In particular, the authors focus on four dimensions: (i) changes in wage differentials by skill level; (ii) changes in labor market segmentation; (iii) changes in government (or public) transfers, and (iv) changes in the minimum wage. Between 2001 and 2007, wage differentials between workers of different skills, living in different locations, and working in different sectors (formal/informal; primary/secondary) narrowed. Also during this period, public transfers rose (both in terms of average benefit and coverage), and the real minimum wage increased. It is important to mention that the minimum wage has particular importance given the impact it has on retirement pensions.

The paper estimates the order of magnitude of these factors' contribution to the change in inequality by applying a non-parametric decomposition method. In this method the

19. The decline in income inequality in Brazil fulfills the Lorenz dominance test and is statistically significant at 1 percent confidence level. During the period 2004–2007, however, the Lorenz curves cross so the fall in inequality is not unambiguous. The growth rate in income for the bottom 5 percent was below the overall average for all percentiles and less than half of the growth rate corresponding to the second quintile. (Barros et al., forthcoming).

actual Gini coefficients are compared with counterfactual ones generated by keeping some (depending on the question) proximate determinants of income inequality or income sources unchanged (Barros *et al.* 2006, 2007). The decomposition analysis is complemented by econometric evidence on the evolution of returns to education. The paper also compares the redistributive effectiveness of targeted transfers versus increases in the minimum wage.

The authors decompose the changes in the Gini coefficient between 2000 and 2007 into the four proximate determinants of income inequality: (i) changes in the proportion of adults in the household; (ii) changes in the distribution of household non-labor income per adult (which includes government monetary transfers); (iii) changes in the proportion of working adults; and (iv) changes in the distribution of labor income per working adult (average remuneration).

Decomposition results show that most of the recent decline in income inequality was caused by changes in the distribution of household income per adult. Changes in the proportion of adults in the household were responsible for only eight percent of the overall reduction in income inequality. This is a reflection of the fact that the changes in dependency ratios were not disproportionately concentrated among the poor. Between 40 and 50 percent of the decline in income inequality – depending on the inequality measure – was due to changes in the distribution of non-labor income per adult; changes occurred both because inequality of non-labor income fell and the number of households receiving non-labor income rose. Changes in the distribution of labor income per adult can account for 31 to 46 percent of the decline in inequality, due to a significant growth in average labor income per adult and to a moderate decline in its inequality. The contribution of changes in the inequality of access to jobs was rather limited; workers from relatively poor households were not among those that benefited the most from job creation during 2001–2007. Essentially, there was a substantial reduction in both labor and non-labor income inequality among workers.

The fall in labor income inequality was primarily due to the fall in inequality in the distribution of labor income per working adult. One factor that may explain this trend could be changes in access to education. The last decade was marked by an accelerated expansion of education in Brazil, more than twice as fast as the expansion that occurred in the 1980s. Since 2001 the standard deviation in years of schooling has started to fall: from 4.51 in 2001 to 4.41 in 2007. Labor earnings differentials by education level have declined at all levels in Brazil, particularly for secondary and higher education.

The decrease in the labor earnings differential by education level has been one of the factors contributing to the recent decline in inequality in Brazil. Based on the results of a

decomposition exercise, Barros *et al.* suggest that half of the decline in labor earnings inequality (and almost 30 percent of the decline in household per capita income inequality) was caused by the combined effect of a fall in the inequality of education and a fall in the returns to education. The latter—the price effect-- was the predominant factor, accounting for 35 percent of the decline in labor earnings inequality (23 percent for household income), while the former—the quantity effect-- accounted for 11 percent of the decline in labor earnings inequality (3 percent for household income). The reduction in education inequality was the result of the large expansion in educational access that took place in Brazil over the last decade. Thus, the fall in returns is a result of a combination of supply-side and demand-side factors.

What accounts for the remaining half of the reduction in labor earnings inequality? Barros *et al.* argue that about 7 percent is accounted for by a decline in wage differentials between workers in metropolitan areas and those in medium-sized and small municipalities; urban workers versus rural, and primary versus other sectors²⁰. Spatial and sectoral labor market segmentation has been falling and this tendency has reduced income inequality. It is not yet clear which factors explain this trend. Perhaps there has been a relatively higher expansion of some productive sectors in the Brazilian ‘hinterland’ as opposed to the metropolitan areas thereby increasing the demand for labor and pushing up wages in the smaller and medium-sized municipalities compared to the past. There are a number of additional factors that could account for the unexplained 14 percent of wage inequality. These include changes in gender and ethnic discrimination and labor force participation rates, returns to other observable and unobservable characteristics, sectoral re-allocations of production, and rural–urban migration.

As mentioned above, the decline in non-labor income inequality can account for as much as 50 percent of the decline in household income inequality. What are the determinants of the decline in non-labor income inequality? Barros *et al.* (2009) address this question by applying a non-parametric method, which decomposes the observed changes into the contribution of changes in individual sources of income by comparing actual with counterfactual Gini coefficients (Barros *et al.*, 2006, 2007).

The comparison of actual with counterfactual Gini coefficients for 2001 and 2007 yields the following results. The contribution of changes in the distribution of income from

20. Care must be taken because there will be some double counting since education may increase inequality not just through the positive impact on productivity but also by channeling more educated workers to the better jobs in the formal sector of the economy.

assets (rents, interest and dividends) and private transfers was unequalizing but limited. Most of the impact of non-labor income on the reduction of overall income inequality was due to changes in the distribution of public transfers: changes in size, coverage and distribution of public transfers explain 49 percent of the total decline in inequality.

Public transfers represent over 80 percent of non-labor income and 29 percent of household income²¹ and include pensions and other standard contributory social security benefits; the *Benefício de Prestação Continuada* (BPC, a transfer to the elderly and disabled), and the *Bolsa Família*²². The latter is Brazil's conditional cash transfer program, which distributes cash to poor families on condition that the children and adolescents must attend school and meet basic health care requirements. The benefits paid by the program range from R\$ 20 (Reais) to R\$ 182. The program reaches 11 million families (more than 46 million people), a large proportion of the country's 50 million individuals living in poverty. On average, the income of the poor is raised by around 12 percent²³.

Since 2001, the government has increased the average amount of all transfers and broadened the coverage of well-targeted programs such as the *Bolsa Família*. The average amount transferred rose substantially for social security and BPC (55 and 21 percent, respectively) but less for *Bolsa Família* (13 percent)²⁴. *Bolsa Família*, on average, equals 5 percent of average social security benefits. While contributory social security has the largest coverage – about 30 percent of the Brazilian population lives in households receiving contributory social security benefits – the largest expansion was in the *Bolsa Família*, whose coverage increased by close to 10 percentage points between 2001 and 2007, reaching 17 percent of households.

According to the decomposition results, while social security benefits account for almost 30 percent of the overall reduction in income inequality, the increasing coverage of non-contributory benefits (like BPC and *Bolsa Família*) was also important. Despite representing just a tiny fraction of total household income (0.5 percent each), changes in the BPC and *Bolsa Família* explain about 10 percent of the overall decline in income

21. This information is based on the surveys data. It does not include all government monetary transfers. The ratio is with respect to household income as reported in the survey and it is not necessarily equal to the ratio of all government transfers divided by household disposable income from the National Accounts. As we can see in the chapter on Mexico (Esquivel, et al., 2009) the transfers recorded in surveys may represent a small share of government monetary transfers.

22. These two programs represent 1 percent of household income and 5 percent of the public transfers concept measured in the survey.

23. Fiszbein and Schady (2009).

24. The first two are indexed to the minimum wage while *Bolsa Família* is not.

inequality²⁵. In the case of social security transfers, the equalizing effect occurred primarily through an increase in the amount of the average benefit. In the case of *Bolsa Familia*, the predominant factor was the increase in coverage and to a lesser extent the increase in the amount transferred.

In sum, Barros *et al.* conclude that the recent decline in inequality in Brazil resulted from three main factors: (i) decreasing wage differentials by educational level and reductions in the inequality in education; (ii) increasing spatial and sectoral integration of labor markets, in particular among metropolitan and non-metropolitan areas; and (iii) increasing generosity of contributory and non-contributory government transfers. Raising the minimum wage must have played a role through (i) and (iii). In contrast to the episode of falling inequality in the late 1970s, demographic factors and the role of employment was not significant in either direction. Hence, changes in the dependency ratio among the poor, employment and unemployment were of little importance.

Thus, the decline in income inequality in Brazil observed since 2001 may be attributed to the expansion of education, the changes in spatial patterns of labor demand and supply, and the larger size and increased progressivity of some public transfers, most importantly from social assistance (rather than social security). However, the wage gap between formal and informal workers continued to increase. In addition, as mentioned above, between 2004 and 2007, the incomes of the bottom 5 percent fell indicating that there might be flaws in the social assistance program design which deserve further scrutiny.

Mexico

After a period of rising inequality in the 1980s, Mexico's income inequality has been falling for the past decade. (Figure 8) Between 1996 and 2006, Mexico's Gini coefficient fell from 0.543 to 0.498 or by 0.8 percent per year and it declined by 1 percent per year between 2000 and 2006²⁶. The incomes of the bottom 20 percent grew more than twice as fast as the incomes of the top ten percent between 1996 and 2006. Contrary to expectations, the faster growth of incomes at the bottom of the distribution happened during a period of lackluster aggregate economic growth. After the 1995 peso crisis, when GDP contracted by around 8 percent, the economy quickly recovered. Between 1996 and 2000 Mexico's per capita GDP

25. Note that this decomposition of inequality changes by income source is different from the prior decomposition by proximate factors so results cannot be combined.

26. This Gini coefficient was estimated using total household income per capita which includes monetary and non-monetary sources (such as the imputed value for owner-occupied housing rent) and capital gains.

grew at a rate of 4 percent per year. However, between 2000 and 2006, growth slowed significantly; per capita GDP grew at only 1 percent per year. Mexico experienced a period of slow, pro-poor growth.

The decline in inequality coincided with the implementation of the North American Free Trade Agreement (NAFTA) in 1994. It also coincided with a shift in government spending patterns. Since the early 1990s, public spending on education, health and nutrition has become more progressive. In 1997 the Mexican government launched the conditional cash transfer program *Progresa* (later called *Oportunidades*), a large-scale anti-poverty program which reached around five million poor households – around 14.8% of households in 2006. These changes made the post-fiscal income distribution (after taxes and transfers, including in-kind transfers²⁷) less unequal than before, re-enforcing the trend followed by income inequality shown above.

Esquivel, et al. (2009), analyze the proximate determinants of the decline in income inequality between 1994 and 2006. Using standard decomposition methods, the authors examine the roles played by changes in the distribution of labor income, demographics, and government transfers in the decline in inequality. The paper explores the influence on inequality of changes in the composition of the labor force by education and experience, and the relationship between this and changes in the patterns of public spending on education. Using standard benefits incidence analysis, the paper estimates the contribution of *Progresa/Oportunidades* to the observed decline in income inequality. Next, it analyzes the incidence of total public redistributive spending (including in-kind transfers) and taxes.

As shown in Figure 8, the decline in income inequality is robust to different concepts of income. The results are also robust to the use of inequality measures other than the Gini coefficient. Labor income inequality tends to be higher than total income inequality. Finally, Figure 8 also demonstrates that remittances and transfers (both government and private transfers), which are important components of non-labor income, lower inequality and that their equalizing impact appears to have risen over time.

Based on the decomposition method proposed by Barros *et al.* (2009), the change in income inequality is decomposed into changes in (i) the ratio of adults to total number of members in the household, (ii) the proportion of adults working to total number of adults in the household (iii) labor earnings per working adult, and (iv) household non-labor income

27. In-kind transfers mainly include government spending on education and health delivered to the population in the form of free or quasi-free transfers.

(which includes government transfers and remittances) per adult.²⁸ The changes in all of these four proximate determinants were equalizing²⁹. The reduction in the inequality of labor income per working adult (labor earnings per worker from wages and from self-employment) was the most important contributor to the reduction in inequality in both 1996–2000 and 2000–2006: it accounted for 87.1 percent of the decline in inequality in 1996–2000 and for 65.5 percent of the decline in 2000–2006.

The equalizing contribution of changes in the number of adults per household rose from 7.7 percent in 1996–2000 to 10.3 percent in 2000–2006. Also, the equalizing contribution of the proportion of working adults as a share of total adults (which measures both the supply-side decisions to participate in the labor market and the demand-side conditions of finding employment) rose by several percentage points in both 1996–2000 and 2000–2006. However, despite their increase, the contribution of these two factors was smaller than that of changes in labor income (per working adult) and non-labor income (per adult) inequality particularly in the 2000–2006 period. The contribution of labor income to the decline in inequality increased sharply from 0.4 percent in 1996–2000 to 15.1 percent in 2000–2006; the distribution of non-labor income per adult became the second most important contributor to the decline in inequality in 2000–2006.

What has caused the distribution of labor income per working adult to change from being an unequalizing factor in 1994 to an equalizing one thereafter? Hours worked changed very little. In fact, they fell slightly for the bottom quintiles, an inequality-increasing change. Changes in relative hourly wages caused the distribution of labor income per working adult to change from unequalizing to equalizing. Starting in the mid-1990s, the gap between the wages of more educated workers and workers with little education (i.e. the skilled/unskilled wage gap) fell systematically. As shown in Bouillon et al. (2004), changes in the returns to education accounted for a significant share of the rise in household per capita income inequality between 1984 and 1994. During the 1994/96–2004 period the opposite appears to have occurred; returns to education was an equalizing factor. The distribution of the stock of education in the labor force became more equal too. The combined effect of a fall in the

28. In essence, the method consists of decomposing the change in an inequality measure into the contributions from changes in the distribution of the proximate determinants, taken one at a time, plus the contributions from changes in the interaction (correlation) of proximate determinants with each other. The contributions are estimated through a series of sequential counterfactual simulations that assume that the distribution of the proximate determinant of interest remains the same as in the base year.

29. The changes in all the interactions between the proximate determinants combined were unequalizing in both 1996–2000 and 2000–2006.

returns to education and the declines in inequality in educational attainment was a reduction in labor income (per worker) inequality.

The paper does not address whether the fall in the skilled/unskilled wage gap was the result of demand-side or supply-side factors using a formal hypothesis-testing model. Several studies have looked at the demand-side factors emphasizing, among other things, the increasing integration of manufacturing production between the United States and Mexico, and its resulting increase in demand for low-skilled workers in Mexico. However, an examination of the changes in the composition of the labor force by education and experience and the corresponding relative wages suggests that supply-side factors must have been important too. Between 1996 and 2006 the reduction in wage inequality was caused by the fact that workers with lower levels of education and/or fewer years of experience had the largest increases in their average wages. These large increases seem to be correlated with a shift in the composition of labor supply by education and experience. The share of workers with less than lower secondary education (and more than 20 years of experience) declined from almost 55 percent of the workforce in 1989 to about one third by 2006. This reduction was offset by an increase in the shares of all the other groups of workers. These results suggest that the relative increase in the wages of low-skilled/low-experience workers must be associated with a reduction in the relative number of low-skilled workers. This result is not incompatible with the hypothesis of an increase in the demand for unskilled workers. Both supply-side and demand-side factors were at play.

The reduction in the relative supply of workers with low levels of skills (measured by school attainment) might be associated with the increase in average years of schooling for the bottom two quintiles, which reduced schooling inequality considerably between 1994 and 2006. In turn, the latter may be due to changes in public spending on education patterns in the 1990s. Changes in public spending on education combined with the effects of the conditional cash transfer program *Progresas/Oportunidades* – which tied monetary transfers to keeping children of poor households in school and to receiving basic health services – significantly increased access to lower-secondary education by the poor.

Public spending on education in the 1970s and 1980s was heavily biased towards higher education. This changed in the 1990s. The relative ratio of spending per student in tertiary versus primary education declined from a historical maximum of 12 in 1983–1988, to less than 6 in 1994–2000. By comparison, the average ratio for high-income OECD countries is close to 2. It is worth mentioning that the reduction in such ratio could be driven by a reduction in tertiary education spending, with no changes in primary or secondary education

expenditures, as actually happened in certain cases during the crisis of the 80s in the region. In this case, however, even though there was a reduction in tertiary education expenditures in real terms, there was a significant increase in resources devoted to primary and secondary levels. More resources on the supply-side and the implementation of demand-side subsidies for education through *Progresa/Oportunidades*, changed the incidence of public spending on education from being slightly regressive in 1992 to being progressive in 2006. Hence, the fall in skill premiums can be linked to both market factors, which affected the demand for labor by skill, and state action in education spending.

Having established that changes in the distribution of non-labor income per adult played a significant role in accounting for the decline in income inequality, the paper analyzes the contribution to inequality dynamics of the main components of non-labor income. This is done using Stark *et al.*'s (1986) method to decompose the Gini coefficient by income source for 1994, 2000 and 2006. Non-labor income is a very heterogeneous concept. It includes incomes stemming from the ownership of capital (such as profits, interests and rents), private transfers (such as remittances), pensions (public and private), as well as targeted government transfers (such as the conditional cash transfer program *Progresa/Oportunidades*). The results show that a marginal increase in income from own businesses (profits), income from property (rents) and pensions would be unequalizing, whereas that from remittances, transfers and labor income (since 2000) would be equalizing.

The equalizing contribution of transfers rose over time because their share in total income rose and their own inequality and Gini correlation with total monetary income fell. The share of transfers in total income rose because there was a significant expansion in coverage of public monetary transfers – in particular, through a subsidy program for agricultural production (*Procampo*) and *Progresa/Oportunidades*. Although *Procampo* had been expanding since its creation in 1994, the lion's share of the expansion in households receiving non-labor income was due to implementation of the *Progresa/Oportunidades* conditional cash transfer program in 1997. In fact, *Procampo* is not a pro-poor transfer; in contrast, *Progresa/Oportunidades* is an example of 'redistributive efficiency'.

With as little as 0.36 percent of GDP and 4 percent of total redistributive spending, *Progresa/Oportunidades* accounts for 18 percent of the change in the post-transfers change in Gini coefficient. Unfortunately, the redistributive efficiency of this conditional cash transfer program is an exception among redistributive instruments currently operating in Mexico. Public spending had become more progressive between 1990 and 2006 and, according to Esquivel *et al.* (2009), government redistributive spending reduced the pre-fiscal Gini

coefficient by 9.3 percent in 2006 (if we exclude the impact of transfers in kind, the reduction in the Gini coefficient is 1.7 percent). But there is still a large share of government spending that is not redistributive. In 2006, around 58 percent of all the redistributive spending categories (monetary transfers, subsidies³⁰ and in-kind transfers) were regressive in absolute terms (that is, the poor received less than the rich in per capita terms), of which 11 percent was allocated to programs that made the pre-fiscal distribution of income more unequal.

In sum, the decline in inequality in post-NAFTA Mexico can be explained by the equalizing price and quantity effects of education which decreased the relative supply of low-skilled labor. The latter, in turn, reflect the large effort made by the government to expand basic education, including the launching of the conditional cash transfer program *Progresa/Oportunidades*. A second important factor were the expansion of targeted programs to the poor.

Peru

Jaramillo and Saavedra (2009) focus their analysis on the dynamics of the fall in inequality during the post-structural reform period in Peru (1997–2006)³¹. Before concentrating on the recent decline, the authors present an overview of inequality trends in previous decades and conclude that, although there are serious problems of data comparability, the evidence suggests an overall declining trend in inequality starting from the early 1960s. Based on the remarkable expansion of basic education and the equalizing redistribution of land that followed Peru's land reform, the authors conclude that by the mid-2000s the country was undoubtedly less unequal than four decades earlier. Jaramillo and Saavedra remind us, however, that despite the undeniable progress in reduction of inequality, the country's measures of inequality remain high by international standards. In 2006, slightly more than half of total income was concentrated in the top quintile.

Between 1997 and 2006, Peru's Gini coefficient fell from 0.54 to 0.49, a change that was both statistically significant and satisfying Lorenz-dominance. The paper identifies the proximate determinants of this decline in inequality, and discusses the market and policy forces behind them. The decline in inequality appears to be associated with a fall in non-labor income inequality, since labor income inequality remained constant during this period³²

30. This category includes general subsidies to gasoline and other fuels, subsidies and monetary transfers to agricultural producers and the subsidized part of social security pensions.

31. The authors refer to the period that followed the years of trade and investment liberalization and privatization that characterized Peru in the first half of the 1990s.

32. When the two end points are compared; labor income inequality, however, rose between 1997 and 2001 and subsequently fell between 2001 and 2006.

(Figure 9). Non-labor income grew at a higher rate than labor income throughout the income distribution, but the difference was much greater for those households in the lower part, for which the relative importance of non-labor income was greater as well. Although it appears that changes in labor income inequality had little effect on overall inequality, some interesting trends occurred. In Peru, alike other countries in the region, the relative returns to education rose (the profile of returns became steeper) in the first half of the 1990s. By contrast, the skill premium in post-reform Peru fell.

In order to analyze the factors that may account for the evolution of labor income inequality, Jaramillo and Saavedra apply a parametric decomposition analysis³³, which consists of simulating counterfactual distributions by changing one factor at a time and holding other aspects constant³⁴. Among its advantages, this methodology permits the identification of a factor's contribution to inequality related to changes in either its distribution or its market returns. For example, it is possible to isolate the contribution of a change in the distribution of educational attainment (a proxy for human capital) from a change in the returns to education (e.g., the skill premium).

Based on the results of the decomposition exercise, Jaramillo and Saavedra assess the contribution to income inequality of the following factors: educational structure of the labor force, returns to education, returns to residing in an urban area (versus a rural area), returns to a salaried job (versus self-employment), gender earnings gap, hours worked, and unobserved factors. The authors note that the decomposition exercise considers only the direct (partial equilibrium) effect of these factors on hourly earnings.

The decomposition results suggest that change in the educational structure of the workforce (that is, the distribution of human capital) was equalizing. This can be traced back to the earlier expansion in coverage of basic education. Changes in returns to education had an equalizing effect at the individual worker's level but were unequalizing at the household level. The decline in the returns to education appears to be the result of the combined effect of the increase in supply of workers with more years of schooling and the fact that demand for skilled workers did not outpace supply. In effect, the impact of skill-biased technical change petered out. The unequalizing effect of returns to education at the household level suggests that the pattern of assortative mating --better educated and better paid men marrying

33. Bourguignon *et al.* (2005).

34. This methodology differs from that used in the chapters on Brazil and Mexico in that the former simulates the entire distribution while the latter decomposes a specific indicator (the Gini, Theil, etc.).

better educated and better paid women-- became more pervasive, or that married and better educated women increased their participation in the labor force.

The study demonstrated that returns to experience had an equalizing effect. The authors argue that this trend is likely to have been the result of both market and demographic factors. First, the introduction of new technologies brought a premium for operating knowledge – a skill more frequent among the youth – over experience. Second, because of the demographic transition, older workers represent a proportionately larger share of the labor force and thus their relative earnings fell. At the same time, returns to residing in urban areas had an unequalizing effect. However, since 2001, the change in returns to residing in urban areas was equalizing signaling a narrowing of the gap between urban and rural incomes. Changes in the gender earnings gap did not play a significant role in the changes in household income inequality. The returns to having a salaried job (versus self-employment) did play a significant, but opposite role in the two post-reform sub-periods, adding up to a negligible effect over the decade as a whole. In sum, a combination of market forces, public policies and demographics was behind the unchanged labor income inequality.

The decline in non-labor income inequality accounted for the decline in household per capita income inequality. Between 1997 and 2006, non-labor income rose for the entire income distribution, but it rose faster for the bottom of the distribution. The authors analyze this trend heuristically by examining the trends in government transfers.

In Peru, social spending has been slightly biased in favor of the non-poor; on average, social spending on the poorest quintile corresponds to 92 percent of social spending on the richest quintile (whereas, for example, the same figure is 233 percent in the United Kingdom). As a consequence of lower levels of overall spending as well as lower progressiveness, social spending on the poorest income quintile is slightly lower in Peru (9 percent) than in a sample of Latin American countries, where it averages 9.9 percent. Overall, Peru does not excel in redistribution through the tax and transfers structure. On the tax side, revenue collection from personal income taxes has been very low and, on the transfer side, expenditures have not been progressive enough.

Over the last decade, the state has increased its role in redistributing resources, albeit slowly. First, per capita social spending between 1997 and 2006 rose from US\$ 150 to US\$ 206 per year. Second, the proportion of social spending directed to the poor also rose. Transfers to the poor increased in the form of non-monetary transfers³⁵ and public services,

35. These mainly include health services and food transfers.

and more recently, in the form of monetary transfers. Social spending incidence analysis for the period from 2002 to 2006 reveals that the share of non-monetary transfers in household per capita income rose by 0.8 percentage points on average. For the poorest income decile, the increase was equal to 6.5 percentage points; for the second, third and fourth poorest deciles, the respective increases equaled 5.5, 4.3 and 2.6 percentage points, respectively. Jaramillo and Saavedra state that changes in food transfers, in particular, accounted for the increase in the progressiveness of social spending. The authors conclude that more progressive transfers must be one key factor behind the reduction in household income inequality.

While transfers became more pro-poor, the changes at the other end of the distribution reveal that there are some problems in allocation priorities. Between 2002 and 2006, the share of non-monetary transfers in per capita household income fell for the 8th and 9th deciles but rose for the 10th (although by less than the average). This reveals that there is still room for improvement in the design of non-monetary transfers for redistributive purposes.

State action also became more pro-poor in the area of access to basic infrastructure services. Here the Peruvian government has played an important role, either by directly providing access or by promoting private sector expansion into the poorer areas. Between 1997 and 2006, the gap in access to electricity and sanitation services narrowed between the top and bottom 20 percent, as well as between rural and urban areas (although this did not happen with access to phone landlines). In fact, improvements have been the largest to sanitation services. Expansion in access to sanitation has been fast in both urban and rural areas. In urban areas the changes have been definitively pro-poor while in rural areas it has been only slightly pro-poor, as access has expanded significantly for all income groups.

Despite this undeniable progress, gaps in access to basic services remain large. For example, while close to 100 percent of the highest-earning 20 percent in urban areas have access to electricity and sanitation, the access rate for the bottom 20 percent in rural areas is 29 and 25 percent, respectively. The rural poor are still far below their urban counterparts, too; the access rate of the bottom 20 percent in urban areas is 89 percent for electricity and 73 percent for sanitation.

As mentioned earlier, changes in the structure of educational attainment of the labor force have played an equalizing role over the last decade. In effect, during this period, the share of workers with secondary school education increased. This expansion of the educational attainment of the labor force is the result of policies and household decisions over the last four decades. Between 1970 and 2000, school enrolment in basic education increased by 3

percent per year, a higher rate of growth than that of the population at normative schooling age, suggesting a catching-up process among children older than the normative age. However, while enrolment rose, spending per pupil fell and a long-term deterioration of the quality of education reduced its equalizing power. Peruvian public schools, which are attended by children of the poor, tend to be of lower quality than private schools. Adjusting for differences in quality, the authors note that “Peru’s education system is one of the most unequal in Latin America as measured by learning achievement on international tests.”³⁶

In sum, the case of Peru demonstrates that market forces, government policies and demographic factors were at play in the decline in household per capita income inequality between 1997 and 2006. Public policies were important in equalizing the structure of educational attainment, making non-monetary transfers more pro-poor and expanding access to electricity and sanitation for the poor. Market forces kept returns to education in check and, together with demographic factors, decreased returns to experience. The equalization of educational attainment was due to the market-driven investment decisions of families, who saw the opportunity to improve their children’s prospects in life through education.

However, as the authors conclude, the expansion of the educational system was not accompanied by an improvement in the quality of education. Moreover, there are indicators of a potential decline in average quality, while not only average levels, but the inequity in quality indicators may have also increased. Both facts are consistent with the long-term trend of stagnant productivity in earnings and high labor earnings inequality. Finally, the authors argue that the differences between rural and urban sectors remain large, despite improvements in rural economic conditions, and they are related to differences in public infrastructure and human capital, the reduction of which becomes a central public policy challenge.³⁷

3. Summary of the Main Findings

The country studies for Argentina, Brazil, Mexico and Peru address the following questions: what is the contribution of demographic factors (changes in the proportion of adults in the household, for example) to the observed change in household per capita income inequality? Are changes in the distribution of labor income important? Are the changes in labor income driven by changes in the distribution of personal characteristics (in particular, in the distribution of educational attainment), changes in the returns to personal characteristics (returns to education, in particular) or changes in employment, hours worked or occupational

36. Jaramillo and Saavedra (forthcoming).

37. Jaramillo and Saavedra (forthcoming).

choice (wage labor vs. self-employed, for example)? If changes in all three are relevant, what caused them to change in turn? Was it increased coverage of basic education, the skill-mix of technological change, macroeconomic conditions or stronger labor unions? What has been the role of changes in the distribution of non-labor income? What determined those changes? Do changes in government transfers account for a significant part of the change in inequality in non-labor and overall income inequality?

There are several patterns that recur throughout the four case studies and point to new dynamics of inequality in Latin America. First, in all four countries changes in the distribution of the dependency ratio were equalizing. The proportion of dependents fell more in poorer households but the contribution of this factor was relatively less important than the contribution of the reduction in labor earnings inequality³⁸ and non-labor income inequality. Also, the equalizing contribution of demographic changes was already underway in the 1990s reflecting the reduction in fertility rates that has characterized the region in the past two or three decades. It is not a new phenomenon.

The two most important differences between the 2000s and the 1990s (and 1980s too, depending on the country) are the fall in both labor earnings inequality and non-labor income inequality. Declines in labor earnings inequality appear to be associated with less steeper returns to education functions, which reduced earnings per worker inequality, and much less so--or not at all--to changes in employment patterns. In contrast to the 1990s, the earnings gap between skilled and low-skilled workers fell. In Brazil, Mexico and Peru this seems to have been driven mainly by changes in the composition of labor supply. As a result of a significant increase in coverage of basic education (usually up to ninth grade)³⁹, low-skilled labor has become relatively scarce and therefore can command relatively higher wages. In Argentina, however, the reduction in this gap seems to be associated with several events: the post-2002 commodity boom, which increased total employment; the 2002 devaluation of the peso, which shifted demand in favor of sectors intensive in low-skilled labor; government mandated wage increases (including the minimum wage) and stronger labor unions. In Argentina, a pro-union government keen in redistributing the windfall obtained from higher commodity prices together with the out-of-the-ordinary growth rates due to favorable terms of trade, seem to be the main factors explaining the decline in inequality. In Brazil, higher

38. In the case of Peru, the result is found for individual earnings but not at the household level indicating that assortative matching dampens the equalizing effect at the individual earnings level.

³⁹ Basic education goes from grades 1-9 in Argentina and Mexico; from 1-8 in Brazil; and, from 1-11 in Peru. The number of grades include what countries call as basic primary and secondary education.

minimum wages appeared to play a role as well. However, this was not the case in Mexico and Peru.

In addition to the *price effect* of education, the educational upgrading of the labor force resulted in a more equal distribution of schooling attainment in the four countries and particularly in Brazil, Mexico and Peru. Thus, the *quantity effect* of education was also an equalizing factor. The significant increase in coverage in basic education, in turn, seems to be associated with conscious government efforts (including past administrations). Higher spending per student in basic education and an effort to make education accessible in rural areas eased supply-side constraints. In addition, the conditional cash transfer programs *Bolsa Familia* (Brazil) and *Progresas/Oportunidades* (Mexico) reduced demand-side constraints by compensating poor households for schooling costs and the opportunity cost of children's labor.⁴⁰

The reduction in labor earnings inequality—and of the skill premium in particular—contrasts with what occurred in the previous decades. In the 1980s and, in particular, in the 1990s returns to education rose. The evidence suggests this was caused by the opening up of the economies to international trade and foreign investment and the concomitant skilled-biased technical change. The reduction of the returns to education in the late 1990s and first half of this decade suggests that the unequalizing impact of the skilled-biased technical change had run its course. Labor market dynamics became increasingly affected by the structural changes in the composition of labor supply by skill (years of schooling).

The reduction in the inequality of non-labor income was the second major factor behind the fall in inequality. Non-labor income includes quite disparate income sources: (1) returns to physical and financial capital (interests, profits and rents), (2) private transfers (for example, remittances) and (3) public transfers (monetary, and in the case of Peru, some transfers in kind). The contribution of changes in returns to physical and financial capital tended to be small and unequalizing. In terms of private transfers, remittances proved to be equalizing and became even more so in the 2000s, because they closed the gap between rural and urban household per capita incomes. Remittances were particularly relevant in the case of Mexico. However, the new phenomenon was the significant rise in importance of the equalizing contribution of public transfers in the 2000s. A detailed analysis of the contribution of programs such as *Bolsa Familia* (Brazil) and *Progresas/Oportunidades* (Mexico) shows the remarkable redistributive power of well-targeted cash transfers to the

40. *Bolsa Familia* and *Progresas/Oportunidades* are briefly described in chapters 5 and 6, respectively.

poor in reducing inequality (and, of course, poverty). These programs are a small share of total government redistributive spending (and GDP) but go a long way in terms of redistributing income to the bottom of the distribution.

Finally, another trend that was present in the four countries analyzed here is that government spending on transfers (monetary and non-monetary) became more progressive in the 2000s. This trend went beyond targeted cash transfers. Spending on health, education, nutrition and basic infrastructure (electricity and water and sanitation, for example) became more progressive—that is, more pro-poor. In spite of the observed progress, however, a large share of public spending is still neutral or regressive from the distributive point of view. In addition, taxes, in particular personal income taxes, are severely underutilized as an instrument of redistribution in a region characterized by having a substantial number of ultra-high net worth (i.e. super rich) individuals.

4. Concluding remarks

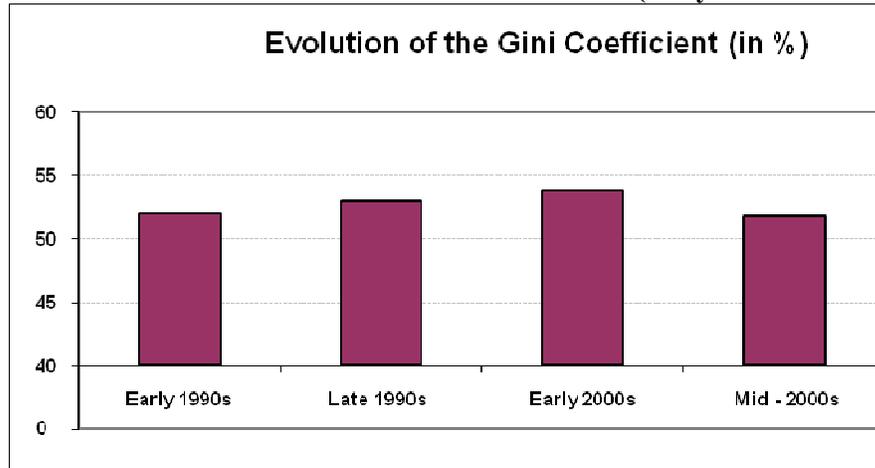
During most of the first decade of this century, income inequality in Latin America has declined, in some cases since the late 1990s. The Gini coefficient declined between 2000 and 2006 in 12 of the 17 Latin American countries for which data are available. Our in depth analyses for Argentina, Brazil, Mexico and Peru reveal that two main factors are found to account for much of the decline: a fall in the earnings gap between skilled and low-skilled workers and more progressive government transfers. In Brazil, Mexico and Peru, the fall in the skill premium seems to be associated with government efforts to expand the coverage of basic education which made educational attainment less unequal and made low-skilled labor relatively less abundant. Thus, through both quantity and price effects, the expansion of education was equalizing. In Argentina, the decline in inequality is associated with government fiscal and labor policies which took advantage of the windfall in public revenues and overall growth generated by high commodity prices. Because the latter are known to be volatile, the government's redistributive stance will be hard to sustain.

Are the equalizing forces through education in Brazil, Mexico and Peru likely to continue? We know that the upgrading of the educational attainment of the labor force will face a tough barrier in terms of post-secondary education. While educational attainment has become undoubtedly and significantly more equal, the same cannot be said regarding the distribution of the quality of education. The poor and middle ranges of the distribution receive an education of significantly lower quality than the top ten percent, which usually attends better quality private schools. This reduces the probability of poor children—even if they completed secondary education—being able to access tertiary education, because they

cannot compete with the better prepared children from richer households. In addition, compensating for poor children's opportunity cost of attending the post-secondary level is more expensive. If the state wants to continue strengthening the path of equalizing opportunities through education as a way to equalize the distribution of income, addressing the inequality in quality levels of basic education and finding ways to compensate for the opportunity cost so poor children can attend tertiary education must take priority in the public policy agenda.

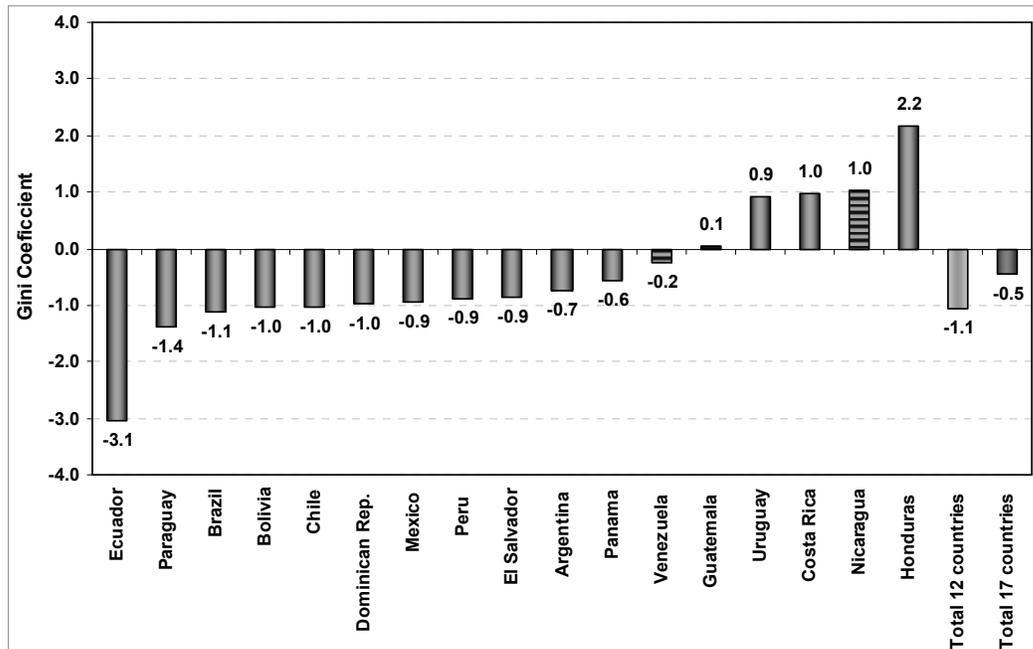
Figure 1

Latin America: Evolution of the Gini Coefficient (early 1990s-mid 2000s)



Source: Gasparini et al. (2008).

Figure 2
Change in Gini Coefficient by Country: circa 2000-2006 in percent

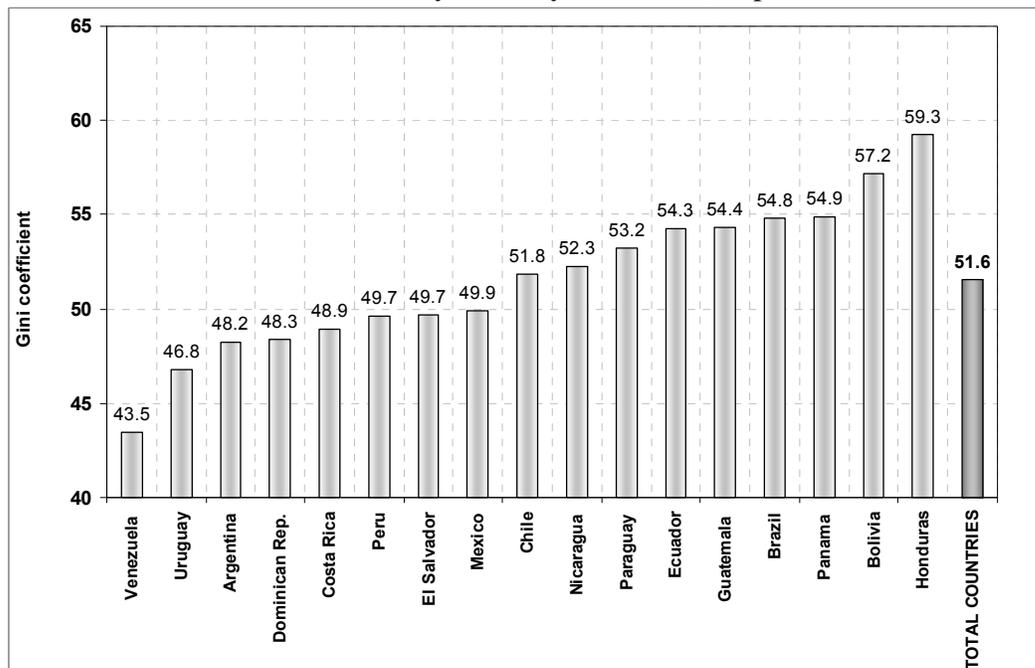


Source: Authors' calculation with data from SEDLAC (July, 2009), <http://www.depeco.econo.unlp.edu.ar/sedlac/eng/>.

Notes:

1. Data for Argentina and Uruguay is for urban areas only. In Uruguay, urban areas covered by the survey represent 80 percent of total population and in Argentina 66 percent.
2. The average change in the Gini for each country is calculated as the percentage change between the end year and the initial year divided by the number of years; the average for the total is the simple average of the changes by country (12 countries in which inequality fell).
3. The years used to estimate the percentage change are: Argentina (2006- 2000), Bolivia (2007- 2000), Brazil (2006- 2001), Chile (2006- 2000), Costa Rica (2007- 2000), Dominican Republic (2007- 2000), Ecuador (2007- 2003), El Salvador (2005- 2000), Guatemala (2006- 2000), Honduras (2005- 2001), Mexico (2006- 2000), Nicaragua (2005- 2001), Panama (2006- 2001), Paraguay (2007- 2002), Peru (2007- 2001), Uruguay (2007- 2000) and Venezuela (2006- 2000).
4. Using the bootstrap method, with a 95 percent significance level, the changes were not found to be statistically significant for the following countries: Guatemala, Nicaragua y Venezuela (are represented horizontal lines in bars in the figure).

Figure 3
Latin America: Gini Coefficient by Country circa 2007; in percent



Source: authors' calculations based on data from SEDLAC (July, 2009).

<http://www.depeco.econo.unlp.edu.ar/sedlac/eng/>.

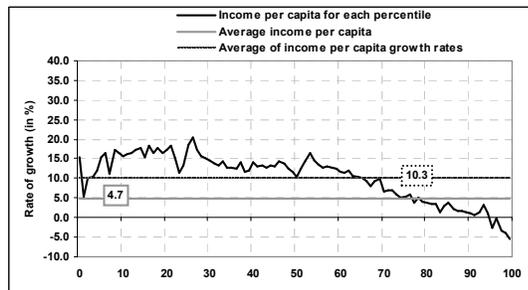
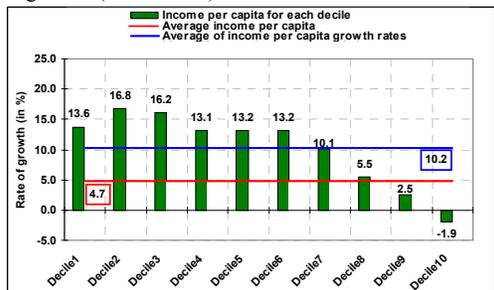
Notes:

a. In order to make the differences in the Gini coefficients easier to compare, the vertical axis starts at 40 percent instead of zero.

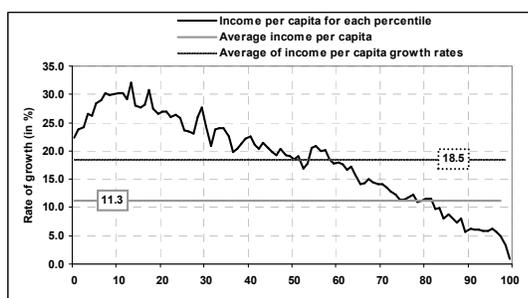
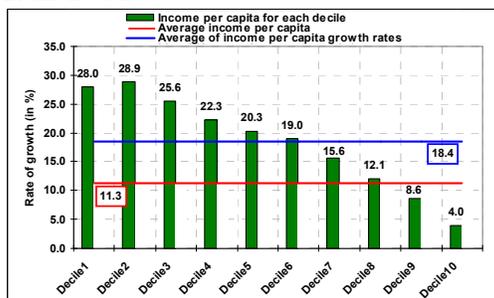
b. The years used to estimate the Gini coefficient are: Argentina (2006), Bolivia (2007), Brazil (2006), Chile (2006), Costa Rica (2007), Dominican Republic (2007), Ecuador (2007), El Salvador (2005), Guatemala (2006), Honduras (2005), Mexico (2006), Nicaragua (2005), Panama (2006), Paraguay (2007), Peru (2007), Uruguay (2007) and Venezuela (2006). The difference in the average for the region with Figure 1 is due to the fact that the latter uses the Gini coefficients for (circa) 2005 and here the numbers correspond to later years.

Figure 4
Growth Incidence Curves by Decile and Percentile: Argentina, Brazil, Mexico (circa 2000-2006) and Peru (1997-2006)

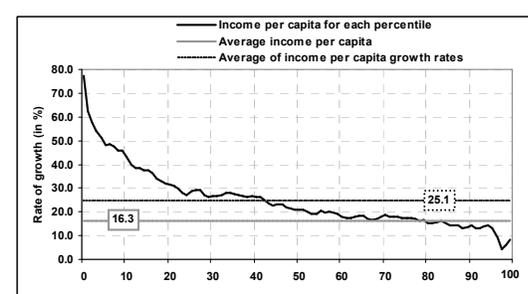
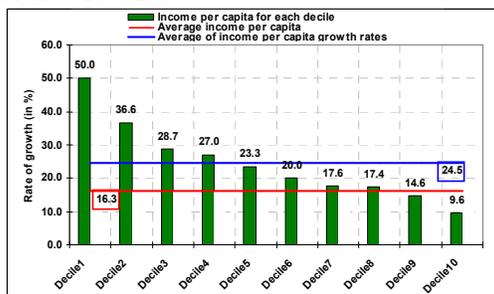
Argentina (urban areas): 2000-2006



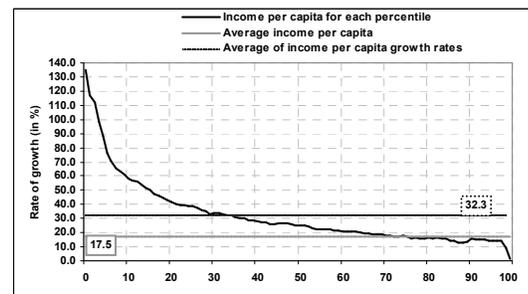
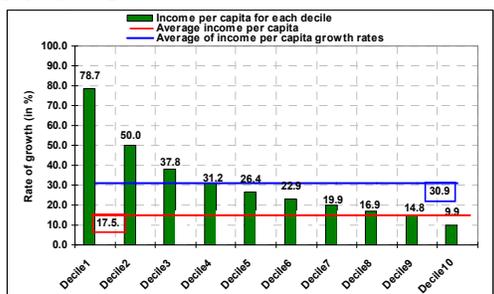
Brazil: 2001-2006



Mexico: 2000-2006



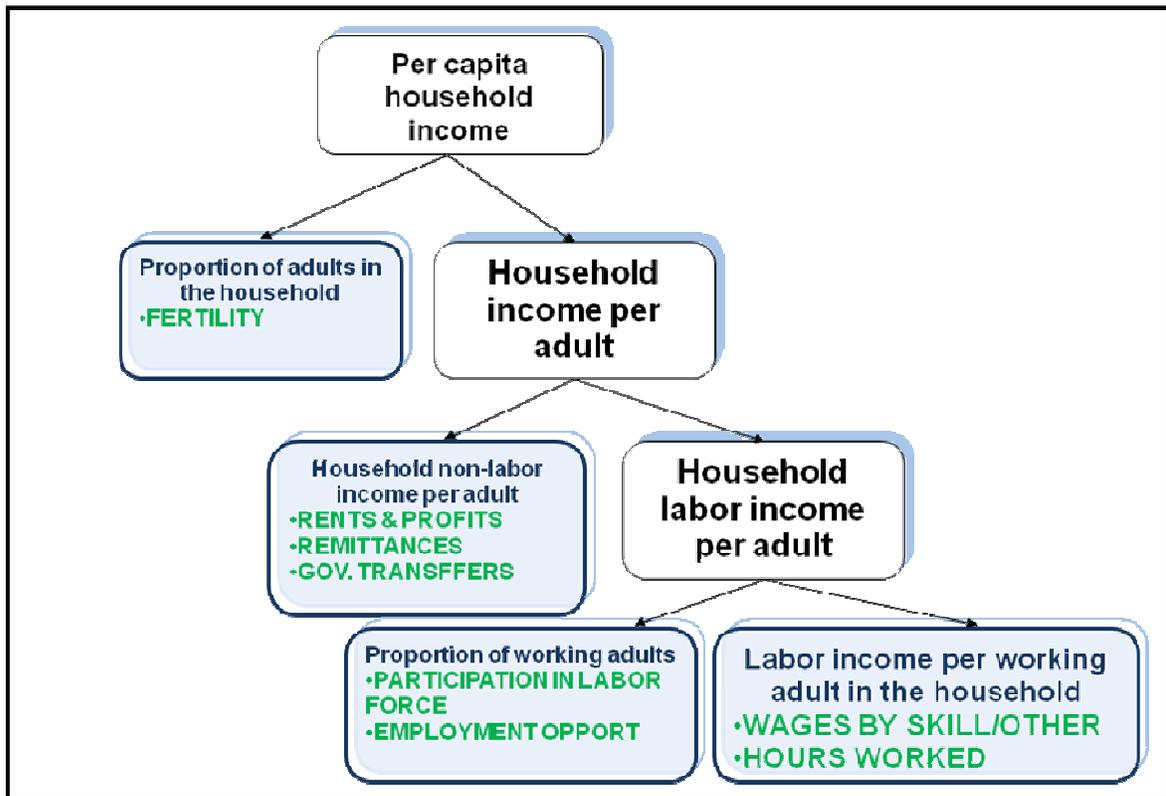
Peru: 1997-2006



Source: Authors' calculation.

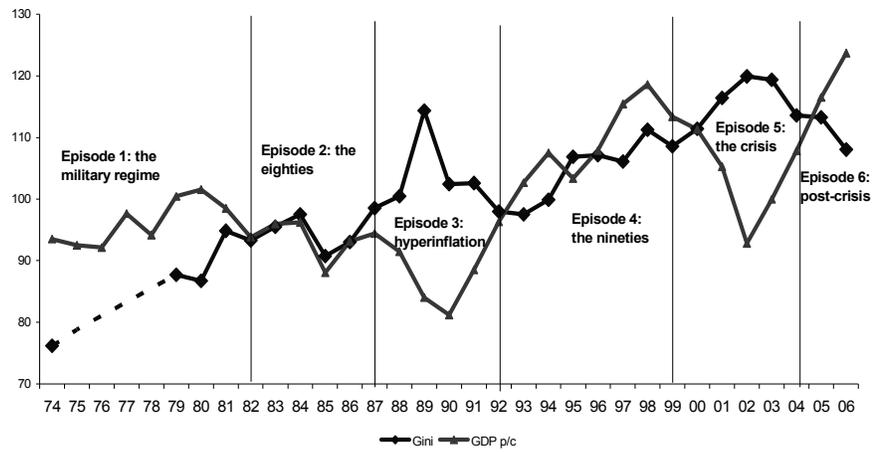
Note: Growth rates are calculated between end points and refer to the total for the period.

Figure 5
Household per Capita Income and its Proximate Determinants



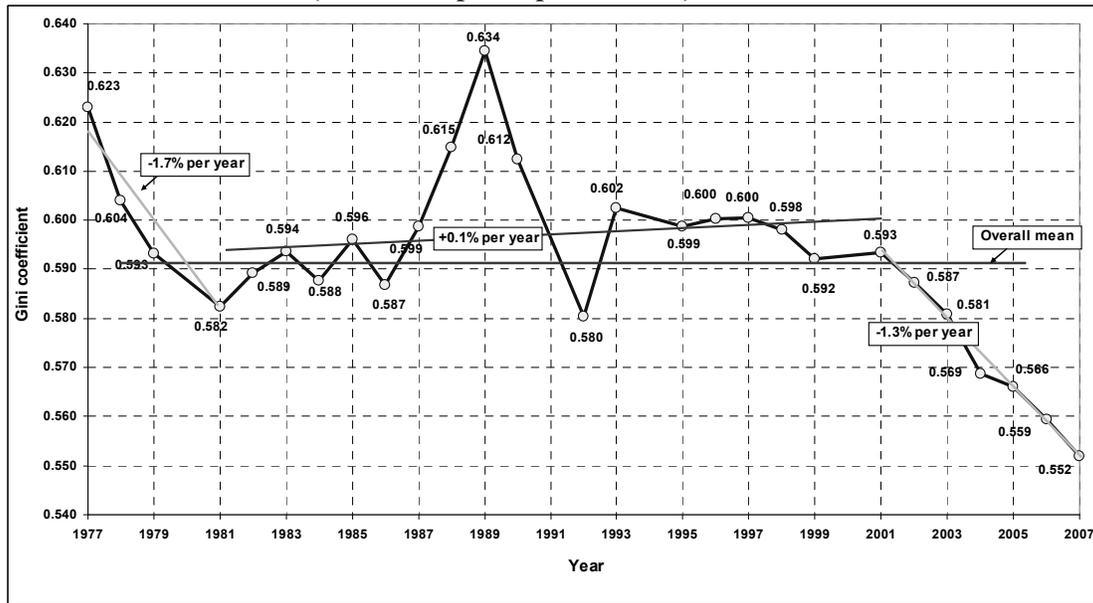
Source: Barros et al. (2009).

Figure 6
Argentina: Gini Coefficient (household per capita income) and GDP per capita: 1924-2006. Indices in percent; average 1974-2006=100



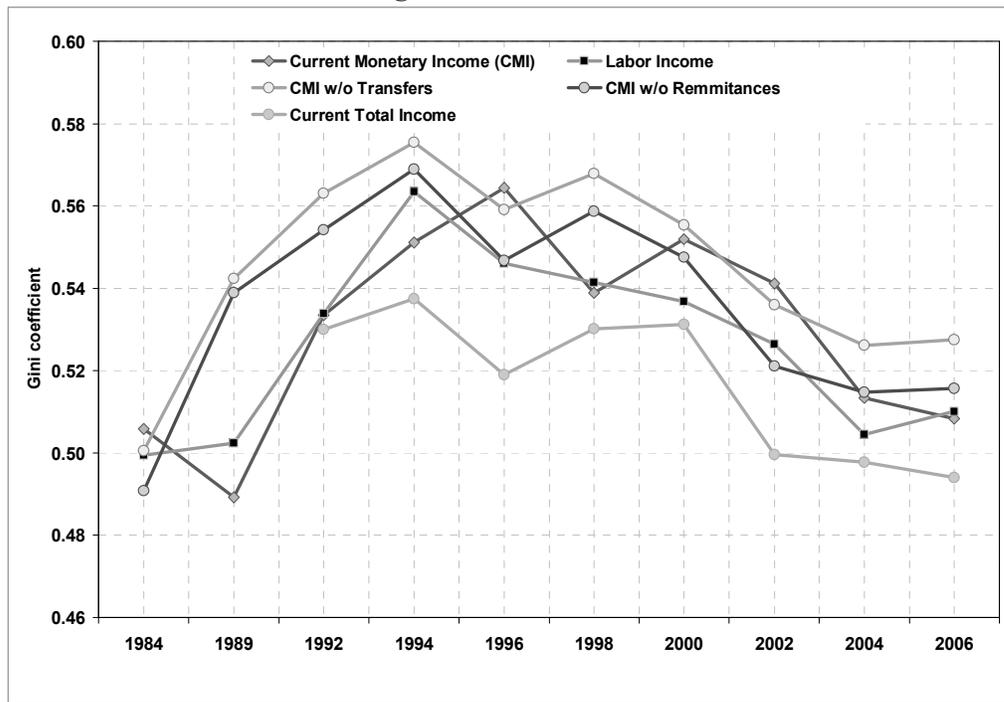
Source: Gasparini and Cruces (2009).

Figure 7
Brazil: Gini Coefficient (household per capita income): 1977-2007



Source: Barros et al. (2009).

Figure 8
Mexico: Gini Coefficients Using Alternative Income Definitions: 1984-2006

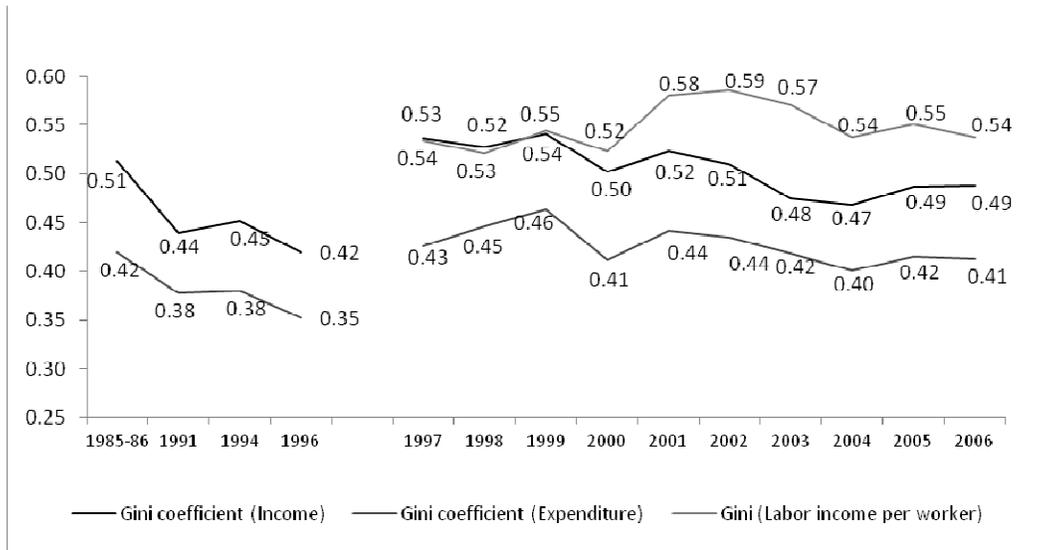


Source: Esquivel, Lustig and Scott (2009).

Note: Current income excludes income from sales of durables and capital gains.

In the graph "w/o" means as without.

Figure 9
Peru: Gini Coefficients for Income, Labor Income and Expenditures: 1985/86-2006



Source: Jaramillo and Saavedra (2009).

Note: Gini is for household total per capita income or expenditures and for labor income per worker in the case of labor income.

Table 1
Economic and socio-demographic indicators: Argentina, Brazil, Mexico and Peru (circa 2000–2006)

	Argentina (urban)		Brazil		Mexico		Peru	
	2000	2006	2001	2006	2000	2006	2001	2006
GDP per capita * (a)	10292.2	11614.5	7936.5	8673.1	10966.2	11800.9	5591.9	6872.9
GDP per capita yearly growth rate: 2006 - circa 2000 * (b)	2.0		1.5		1.2		3.5	
GDP per capita yearly growth rate: 2006 - circa 2003 * (b)	7.8		2.7		2.8		5.2	
Average household per capita income from survey ** (c)	4228.7	4429.5	3713.2	4131.5	2389.0	2777.3	1862.3	2261.4
Population (in millions) *	36.9	39.1	176.7	189.3	98.0	104.2	26.0	27.6
Rural Population (in percent) *** (d)	9.9	8.6	18.8	15.8	25.3	23.7	29.3	28.9
Average household size **	3.9	3.9	3.9	3.6	4.9	4.7	5.9	5.5
Adults per household ** (e)	3.0	2.9	2.7	2.7	3.2	3.2	3.7	3.7
Working Adults per number of adults **	52.5	57.9	61.8	64.2	60.5	63.3	64.8	68.5
Open Unemployment rate ** (f)	14.8	9.5	9.3	8.4	2.2	3.3	5.0	4.2
Share of labor income **	82.7	82.5	78.5	76.7	89.9	88.7	76.4	73.3
Labor force participation **								
Total (f)	58.1	61.6	67.0	69.0	60.7	64.5	69.5	72.6
Female (f)	57.1	63.7	61.3	66.1	46.2	57.0	68.7	72.7
Male (f)	92.0	92.8	90.1	90.0	94.7	94.8	94.0	94.0
Average years of schooling **	9.9	10.5	6.4	7.2	7.7	8.4	7.9	8.6
Cash Transfer Program	Programa Trabajar	Programa Jefes de Hogar	Bolsa Escola	Bolsa Familia	Progresar/ Oportunidades		--	
Gini ** (g)	50.4	48.2	58.8	54.8	52.9	49.9	52.4	49.3
Centile 90/10 ** (h)	11.9	11.2	15.7	12.5	11.4	8.9	11.7	10.6
Poverty (2.5 a day) ** (i)	14.2	11.0	27.4	19.5	21.9	13.9	29.9	20.4
Bottom quintile **								
Income share (j)	3.5	3.7	2.6	3.0	3.4	4.1	3.4	4.0
Average household size (k)	5.4	5.4	4.8	4.5	5.6	5.0	6.4	6.0
Average years of schooling (k)	7.1	7.7	3.4	4.2	3.9	5.1	4.1	4.4
Top quintile **								
Income share (j)	54.8	52.5	63.1	60.4	57.6	55.2	56.7	54.0
Average household size (k)	2.8	2.7	3.2	2.9	3.6	3.6	4.7	4.1
Average years of schooling (k)	13.2	13.6	10.4	11.1	12.0	12.3	11.5	12.2

Sources: Authors' calculations with data from SEDLAC (Socio-Economic Database for Latin America and the Caribbean (CEDLAS and the World Bank):

<http://www.depeco.econo.unlp.edu.ar/sedlac/eng/index.php>, World Development Indicators (WDI) database, World Bank: <http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers> and United Nations Population Division, The 2007 Revision: <http://esa.un.org/unup>.

Notes:

1. (*) Data from WDI. The GDP data is from World Development Indicators (WDI) database, World Bank, July 2009.

2. (**) Data from SEDLAC, July 2009. The household surveys used are Argentina (Urban) 2000: Encuesta Permanente de Hogares (EPH) and Argentina (Urban) 2006: Encuesta Permanente de Hogares-Continua (EPH-C); Brazil 2001 and 2006: Pesquisa Nacional por Amostragem de Domicilios (PNAD); Mexico 2000 and 2006: Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH); Peru 2001 and 2006: Encuesta Nacional de Hogares (ENAHO). All values are in percent.

3. (***) Data from United Nations Population Division and WDI.

(a) The GDP per capita is at PPP prices (constant 2005 international dollars).

(b) The GDP per capita growth (annual %) was calculated based on the geometric growth rate between 2006 - 2000 and 2006 - 2003.

(c) The average household per capita income was annualized multiplying by 12 the monthly per capita income. Household per capita income includes total labor and non-labor income (monetary and non monetary, including imputed rent), is at PPP prices (constant 1993 international dollars).

(d) Ratio of rural population was obtained between the years 2005 and 2000.

(e) Adults were those individuals older than 15 years or head of household.

(f) Figures for Argentina in 2006 without Programa Jefes de Hogar (Head of Household Program) were equal to: 9.7 percent open unemployment rate; 61.1, 63.0 and 92.8 percent for the total, female and male labor force participation, respectively.

(g) Gini coefficient of household per capita income. There might be slight differences between the Gini coefficients presented here and those that appear in the papers included in this volume. These differences are due to the fact that some authors may have used the Gini coefficients that correspond to a different concept of income or were adjusted to make them comparable over time. These differences, however, do not affect the main results discussed here or in the individual papers.

(h) Ratio of average income of centile 90 over average income of centile 10.

(i) The international poverty line of \$2.50 per day based on 2005 prices was used in the estimations of the headcount ratio (FGT(0)).

(j) Bottom and top values are from household per capita income quintiles.

(k) Bottom and top values are from equivalized income quintiles.

Table 2

Decomposition of Inequality by Source: Argentina, Brazil, Mexico and Peru (circa 2000-2006)

ARGENTINA (urban areas): 2000-2006			
Marginal Contribution of Source:	In Percentage Points	In Percent	
Demographic Factors (adults per household)	-0.20	8	
Non-labor Income	-0.68	26	
Part. in Labor Market	-0.43	17	
Earnings per Worker	-1.30	50	
<i>SUBTOTAL</i>	<i>-2.61</i>	<i>100</i>	<i>91</i>
Interactive Term (all)	-0.26		9
TOTAL	-2.87		100
BRAZIL: 2001-2006			
Marginal Contribution of Source:	In Percentage Points	In Percent	
Demographic Factors (adults per household)	-0.23	6.6	
Non-labor Income	-1.61	45.2	
Part. in Labor Market	-0.15	4.1	
Earnings per Worker	-1.57	44.1	
<i>SUBTOTAL</i>	<i>-3.56</i>	<i>100.0</i>	<i>120.8</i>
Interactive Term (all)	0.61		-20.8
TOTAL	-2.94		100.0

Source: Alejo et al. (2009).

Table 2 (continued)

MEXICO: 2000-2006			
Marginal Contribution of Source:	In Percentage Points	In Percent	
Demographic Factors (adults per household)	-0.50	10.3	
Non-labor Income	-0.73	15.1	
Part. in Labor Market	-0.44	9.1	
Earnings per Worker	-3.19	65.5	
<i>SUBTOTAL</i>	<i>-4.87</i>	<i>100.0</i>	<i>158.3</i>
Interactive Term (all)	1.79		-58.3
TOTAL	-3.07		100.0
PERU: 1997-2006			
Marginal Contribution of Source:	In Percentage Points	In Percent	
Demographic Factors (adults per household)	-1.43	59.2	
Non-labor Income	-2.29	94.4	
Part. in Labor Market	0.08	-3.4	
Earnings per Worker	1.21	-50.1	
<i>SUBTOTAL</i>	<i>-2.42</i>	<i>100.0</i>	<i>59.5</i>
Interactive Term (all)	-1.65		40.5
TOTAL	-4.07		100.0

Source: Alejo et al. (2009).

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