



Working Paper Series

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How much, since when and why**

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**ECINEQ WP 2011 – 211**

## The decline in inequality in Latin America: How much, since when and why\*

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### Abstract

Between 2000 and 2009, the Gini coefficient declined in 13 of 17 Latin American countries for which comparable data exist. The decline was statistically significant and robust to changes in the time interval, inequality measures and data sources. In depth country studies for Argentina, Brazil, Mexico and Peru suggest that there are two phenomena which underlie this trend: (i) a fall in the premium to skilled labor (as measured by returns to education); and (ii) higher and more progressive government transfers. The fall in the premium to skills results from a combination of supply and demand factors and, in Argentina—and to a lesser extent in Brazil—, from more active labor market policies as well.

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

**JEL Classification:** D31, D33, H53, J48, O15, O54

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\* This draws from the UNDP-sponsored project “Markets, the State and the Dynamics of Inequality in Latin America” coordinated by Luis F. Lopez-Calva and Nora Lustig. The authors are grateful to Francisco Ferreira for his comments on an earlier draft, and to Samantha Greenspun for her valuable research assistance. The views expressed here may not represent that of the institutions with which the authors are associated. Errors and omissions remain the authors’ responsibility.

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## Introduction

Inequality is a distinctive feature of Latin America due to its high level and persistence (Figure 1).<sup>3</sup> However, after rising in the 1990s, income inequality in the region has declined while it has increased in other parts of the world (Figure 2).<sup>4</sup> For the region as a whole, the Gini coefficient declined from an average of 0.529 in 2000 to 50.9 in 2009. Of the 17 countries for which comparable data exist, 13 experienced a decline in their Gini coefficient during this period. (Figure 3) This widespread decline in inequality is remarkable. 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-whites.<sup>5</sup> Hence, the observed fall in inequality is good news both in terms of fairness and efficiency.

Is the decline in inequality significant? Is it robust? Are there common factors that explain it? What was the role played by labor markets and social expenditures? After analyzing the evolution of inequality in Latin America, this paper summarizes the findings of the UNDP-sponsored project “Markets, the State and the Dynamics of Inequality in Latin America.” for Argentina (urban),<sup>6</sup> Brazil, Mexico, and Peru, a representative sample of Latin America’s diversity in terms of initial inequality and economic growth.<sup>7</sup> The analysis suggests that the decline in inequality is robust to the selection of the time interval, inequality measure and data source. It also suggests that there are two phenomena underlying this new trend that are present in the four countries: (i) a fall in the premium to skilled labor and (ii) higher and more progressive government transfers.

This paper is organized as follows. Section 1 presents the evolution of inequality for Latin America. Section 2 includes detailed country narratives that delve into the determinants of inequality changes. A synthesis of the main findings is presented in Section 3. Section 4 concludes.

### 1. The Evolution of Inequality in Latin America

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<sup>3</sup> In the mid-2000s, with a Gini coefficient of .53, Latin America was 18 percent more unequal than Sub-Saharan Africa, 36 percent more unequal than East Asia and the Pacific and 65 percent more unequal than advanced countries. Ferreira and Ravallion (2009).

<sup>4</sup> Also see Gasparini et al. (2008).

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

<sup>6</sup> Household surveys in Argentina cover urban areas only and represent about two thirds of the population.

<sup>7</sup> 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); one of the most unequal countries in Latin America (Brazil); 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); 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.

Latin America was already a region of sharp income inequality before the debt crisis and structural reforms of the 1980s and 1990s when inequality rose in most countries. Around 2000, the rising trend in inequality came to a halt (Figure 2). Since then, and based on the SEDLAC's data,<sup>8</sup> the Gini coefficient has declined in 13 out of 17 countries for which comparable data are available (Figure 3). The decline in inequality has been widespread. Inequality has fallen in high inequality Brazil and low (by Latin American standards) inequality Argentina and Venezuela; countries with a large share of indigenous population (Bolivia, Ecuador and Peru) and countries with a low share (Argentina); countries governed by the left (Brazil and Chile) and countries governed by non-leftist regimes (Mexico and Peru); countries with a universalistic social policy (Argentina and Chile) and countries with a traditionally exclusionary state (Bolivia and El Salvador). It has declined in countries recovering from crises in the early 2000s (Argentina and Venezuela) and, during the global recession in 2009, inequality continued on its downward trend in eight of the countries for which data exist (and it rose in three). Notably, inequality has declined both in fast growing countries (Chile and Peru) and slow growing ones (Brazil and Mexico). In fact, the longest periods for which the decline could be documented correspond to Brazil and Mexico, two countries whose growth rates were rather slow in comparison.<sup>9</sup> (Figure 4)

The order of magnitude of the decline is non-trivial and, in the majority of cases, it is statistically significant. In country after country, the decline was at least equal to or higher than the increase in inequality in the preceding period (Figure 5). Of the 13 countries, the decline was not statistically significant in only two: Bolivia and Honduras (Figure 3).<sup>10</sup> Furthermore, the results are robust to the selection of the time period,<sup>11</sup> inequality measure (Gini, Theil and 90/10 ratio, for example) and data source (SEDLAC or UNECLAC).<sup>12</sup> Changing the end years, using a different inequality measure, or UNECLAC as a source changes the ranking of countries and the total number that experienced a decline may be 12 instead of 13. However, the main conclusion remains intact: the decline in inequality has been widespread and, in most cases, non-trivial and statistically significant.<sup>13</sup>

## **2. The Determinants of the Decline in Inequality: Argentina, Brazil, Mexico and Peru**

Factors that cause the distribution of income to change can be broadly classified into four categories: changes in the underlying distribution of assets and personal characteristics; changes in their returns; changes in the intensity of use of assets and labor market participation; and, changes in unearned income, including private and public transfers. At the household level,

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<sup>8</sup> The Socio-economic Database for Latin America and the Caribbean or SEDLAC is a joint project of CEDLAS (at Universidad de La Plata, Argentina) and The World Bank. The version of SEDLAC used in this paper is March 2011 (<http://sedlac.econo.unlp.edu.ar/eng/>)

<sup>9</sup> Brazil's per capita GDP for the period 1998-2009 was equal to 1.9 percent per year; Mexico's was 2.5 percent per year for the period 1996-2008, the last year for which data on inequality was available.

<sup>10</sup> Using the bootstrap method, the changes were found to be significant at a 95 percent level and with 100 replications.

<sup>11</sup> Although the order of the countries changes, the result is robust if we change the end years by one year or use a three-year average for the end points. The number of the countries with declining inequality may fall from 13 to 12 when end points are changed.

<sup>12</sup> UNECLAC stands for United Nations Economic Commission for Latin America and the Caribbean. See, for example, Barcena et al. (2010).

<sup>13</sup> The "robustness tests" are available from the authors.

changes in the distribution of income will also be affected by changes in assortative matching, demographics (e.g., fertility and life expectancy) and consumption patterns. State action can modify the distribution of income through two main channels: directly, through fiscal or budgetary interventions (taxes and transfers) that change disposable income and purchasing power (through, for example, indirect taxes and subsidies);<sup>14</sup> and, indirectly, through interventions that affect the determinants of market or primary income. 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? In the four countries, the decline was substantial, statistically significant, there was Lorenz dominance and results were robust with respect to the choice of income variable (monetary or total income; before and after net transfers) and inequality measure (Gini and entropy measures).

### **Argentina<sup>15</sup>**

Urban Argentina experienced 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 (Figure 5). This period 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.

Between 1991 and 2002, the Gini coefficient increased from 0.4652 to 0.5326. During the 1990s a factor behind the increase in inequality was the increase in the steepness of returns to education: the wage 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. Another factor behind the rise in earnings inequality was the weakening of labor unions. There is evidence that labor union membership and activity diminished significantly from 1991 to 2001. The decline in union activity coincided 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, unsurprisingly, coincided with a period of rising wage inequality.

Following the 2002 crisis, the Gini coefficient fell from 0.5326 in 2002 to 0.4486 in 2009. During this period, both labor income (earned) and non-labor income (unearned) income inequality declined. A decomposition of the change in the Gini finds that 67 percent of the total decline in household per capita income inequality can be accounted for by the reduction in labor income inequality.<sup>16</sup> The fall in labor income inequality can be accounted for by the expansion of

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

<sup>15</sup> Based on Gasparini and Cruces (2010).

<sup>16</sup> Alejo et al. (2009). 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

employment generated by the fast economic recovery, the shift in favor of more low-skilled labor-intensive sectors as a result of the devaluation of the Argentine peso, the fading out of the effect of skill-biased technical change in the 1990s, and the rise in the influence of labor unions. All these factors caused the skill premium to fall (Figure 6). This period was characterized by unprecedentedly high per capita GDP growth (of 8 percent a year since 2003 (except for the global crisis year of 2009)) and a sharp fall in the unemployment rate: from over 20 percent to 8 percent.<sup>17</sup> Although the devaluation initially had a negative impact on real wages, this effect faded as a cheaper peso stimulated output in labor-intensive sectors. By the early 2000s, the large-scale technological upgrading was probably coming to an end. Hence, the upward pressure on wages for skilled labor—an unequalizing force—subsided and the skill premium declined. A pro-union and pro-workers government raised minimum wages, mandated lumpsum increases in wages in the private sector and promoted collective bargaining. The revival of union activism coincided with a period of falling wage inequality after 2002.

The decline in non-labor income inequality can be linked to a more progressive fiscal policy. The large devaluation of the peso in 2002 had an indirect equalizing impact in terms of post-fiscal income inequality. The devaluation initially 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 initially 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. 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 addition, the excise taxes had an indirect redistributive impact because they kept domestic prices of traded goods below their international level; this was particularly important for food prices. Although the benefits of these policies leak to the non-poor and create inefficiencies, they are equalizing, at least in the short-term.

In sum, underlying the recent decline in inequality in Argentina are the petering out of the effect of technological upgrading coupled with strong labor-intensive growth. Market forces have been complemented with state action. A pro-union and pro-disenfranchised government has been redistributing the windfall from very favorable terms of trade (associated with the global commodity boom) both through active labor market policies and taxes and transfers.

## **Brazil<sup>18</sup>**

Brazil is known for having one of the highest inequality in the world. There have been years when Brazil's Gini coefficient was equal to 0.63, almost a historical and worldwide record. After rising in the 1970s and 1980s and a decade of almost no change in the 1990s, the Gini coefficient

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distribution of the proximate determinant of interest remains the same as in the base year. For details on the methodology, see Barros et al. (2006 and 2007).

<sup>17</sup> 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 had been implemented.

<sup>18</sup> Based on Barros, de Carvalho, Franco and Mendonça (2009b and 2010).

declined steadily starting in 1998 and especially since 2002 (Figure 5). Between 1998 and 2009, Brazil's Gini coefficient declined 5.4 percentage points from 0.5917 to 0.5374.<sup>19</sup> During the period 2002-2009, the income of the bottom 10 percent grew at 7 percent per year (similar to China's GDP per capita growth), nearly three times the national average (2.5 percent), while that of the richest 10 percent grew only at 1.1 percent a year. Two thirds of the decline in extreme poverty can be attributed to the reduction in inequality. For the same reduction in extreme poverty, Brazil's overall per capita income would have needed to grow an extra 4 percentage points per year.

Like in Argentina and Mexico, the premium to skills (in effect, to higher education) rose in the 1990s and declined in the 2000s (Figure 6). In contrast to Argentina and Mexico, however, trade liberalization in the 1990s had not been associated with this phenomenon.<sup>20</sup> In the 2000s, 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, the real minimum wage increased and public transfers rose (both in terms of average benefit and coverage).<sup>21</sup>

A decomposition of the changes in the Gini coefficient in the 2000s suggests that changes in the distribution of household labor income per adult accounted for 31 to 46 percent of the decline in inequality,<sup>22</sup> due to a significant growth in average labor income per working adult and to a moderate decline in its inequality. In contrast to Argentina, the contribution of changes in employment was rather limited; workers from relatively poor households were not among those that benefited the most from job creation during this period.

The fall in inequality in the distribution of labor income per working adult is determined, among other things, by the quantity and the price effect of changes in the distribution of schooling. The 1990s was marked by an accelerated expansion of basic education in Brazil. The Gini coefficient for education declined from 0.4792 in 1990 to 0.3487 in 2009 (Figure 7). This changed the composition of the labor force by educational level with low-skilled and unskilled workers becoming relatively less abundant (Figure 6). Everything else equal, the latter should have pushed down earning differentials by education level (i.e., the skill premium); in fact, relative returns to education, particularly for secondary and higher education (vis-à-vis workers without schooling or incomplete primary) fell (Figure 6). Decomposition results suggest that half of the decline in labor earnings inequality (and almost 30 percent of the decline in household per capita income inequality) was explained by the combined effect of a fall in the inequality of education and a fall in the steepness of 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).<sup>23</sup>

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<sup>19</sup> 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., 2010).

<sup>20</sup> Ferreira et al. (2007) find that “Unlike in other Latin American countries, trade liberalization appears to have made a significant contribution towards a reduction in wage inequality.” (Abstract)

<sup>21</sup> The minimum wage affects not only labor earnings but also unearned incomes of recipients of government transfers because some key benefits—for example, pensions—are change with the minimum wage.

<sup>22</sup> The figures depend on the inequality measure that is decomposed.

<sup>23</sup> Barros et al. (2009 and 2010).

The decline in labor earnings inequality is also accounted for by a reduction in spatial and sectoral labor market segmentation. Wage differentials between similar workers in metropolitan areas and those in medium-sized and small municipalities declined and so did wage differentials between urban workers versus rural, and primary versus other sectors.<sup>24</sup> This process seems to indicate that there have been equalizing forces in the labor markets arising from labor demand. 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 agricultural ‘hinterland’ as opposed to the metropolitan/industrial areas thereby increasing the demand for labor and pushing up wages in the smaller and medium-sized municipalities compared to the past.

Decomposition analysis suggests that between 40 and 50 percent of the decline in income inequality – depending on the inequality measure – was due to changes in the distribution of household non-labor income per adult; the impact of non-labor income arose from both a fall in non-labor income inequality and an increase in the number of households receiving non-labor income. What are the determinants of the decline in non-labor income inequality? The contribution of changes in the distribution of income from 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.<sup>25</sup>

Public transfers represent over 80 percent of non-labor income and 29 percent of household income<sup>26</sup> 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*.<sup>27</sup> Since 2001, the government has increased the average amount of all transfers and broadened the coverage of well-targeted programs such as Brazil’s signature conditional cash transfer program *Bolsa Família* (literally, scholarship for the family). 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 *Bolsa Família*, whose coverage increased by close to 10 percentage points between 2001 and 2007, reaching 17 percent of households.<sup>28</sup>

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.<sup>29</sup> Despite representing just a tiny fraction of total household income (0.5 percent each), changes in the BPC and *Bolsa*

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<sup>24</sup> 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.

<sup>25</sup> Alejo et al. (2009). For details on the methodology, see Barros et al. (2006 and 2007).

<sup>26</sup> 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.

<sup>27</sup> These two programs represent 1 percent of household income and 5 percent of the public transfers concept measured in the survey. *Bolsa Família*, on average, equals 5 percent of average social security benefits.

<sup>28</sup> The program distributes cash to poor families on condition that the children and adolescents must attend school and meet basic health care requirements. The program reaches 11 million households (more than 46 million people) and covers a large proportion of the country’s 50 million individuals living in poverty. On average, the income of the beneficiaries is raised by around 12 percent. Fiszbein et al. (2009).

<sup>29</sup> Barros et al. (2009 and 2010).



*Familia* explain about 10 percent of the decline in household income inequality each.<sup>30</sup> 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 Família*, the predominant factor was the increase in coverage and to a lesser extent the increase in the amount transferred.

In sum, 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) larger and better targeted non-contributory government transfers. Raising the minimum wage played a role through (i) and (iii); in particular, because social security benefits are indexed to the minimum wage. The direct impact of demographic factors was not very significant. Changes in the dependency ratio, employment and unemployment among the poor were of relatively less importance.<sup>31</sup>

### Mexico<sup>32</sup>

After a period of rising inequality in the 1980s and first half of the 1990s, Mexico's income inequality has declined (Figure 5). Between 1996 and 2008, Mexico's Gini coefficient fell from 0.5472 to 0.5052 or by 4.2 percentage points.<sup>33</sup> The income of the bottom 20 percent grew more than twice as fast as the income of the top ten percent. 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 grew at a rate of 4 percent per year. However, between 2000 and 2008, per capita GDP grew at around 1 percent per year. Mexico –like Brazil– experienced a period of slow, and perhaps paradoxically, 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.

Decomposition analysis suggests that 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.<sup>34</sup> In the 2000s, it accounted for 65.5 percent of the decline in household per capita income inequality. What caused the distribution of labor income per working adult to change from being an unequalizing factor in the early 1990s to an equalizing one thereafter? Hours worked changed very little. In fact, they fell slightly for the

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<sup>30</sup> Note that this decomposition of inequality changes by income source is different from the prior decomposition by proximate factors so results cannot be combined.

<sup>31</sup> Demographics, however, can be an important indirect factor. The lower fertility rates of the past decade, for example, imply that the demand for primary education (or the costs of providing universal coverage of primary education to the whole population) are lower and decreasing, freeing fiscal resources for post-primary education and other areas of social spending. The rate at which the low-skilled labor supply grows, is lower too. For a discussion of these factors, see Ocampo and Vallejo (forthcoming).

<sup>32</sup> Based on Esquivel, Lustig and Scott (2010).

<sup>33</sup> 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.

<sup>34</sup> For details on the methodology, see Barros et al. (2006 and 2007).

bottom quintiles, an inequality-increasing change. It is the changes in the relative hourly wages what caused the switch. Starting in the mid-1990s, the premium to skills --measured by the gap between the wages of more educated workers and workers with little or no education-- fell systematically. Changes in the returns to education accounted for a significant share of the rise in household per capita income inequality between 1984 and 1994.<sup>35</sup> During the period of declining inequality (mid 1990s to 2006) the opposite occurred; returns to education became 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 returns to education and the decline in inequality in educational attainment was a reduction in labor income (per worker) inequality. Both the price and quantity effects were equalizing.

During this period, the reduction in wage inequality happened because workers with lower levels of education and/or fewer years of experience had the largest increases in their average wages. Both demand- and supply-side factors must have contributed to the reduction in the premium to skills. The demand-side factors have been associated with the greater integration of production with the United States following NAFTA. An examination of the changes in the composition of the labor force by education and experience and the corresponding relative wages suggests that the wage increases for low-skilled workers seem to be also correlated with a shift in the composition of labor supply by education and experience (Figure 6). 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. 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 (Figure 7). In turn, the latter may be due to changes in public spending on education in the 1990s which expanded basic education considerably.

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.<sup>36</sup> 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 *Progresal/Oportunidades*, changed the incidence of public spending on education from being slightly regressive in 1992 to being progressive in 2006. Hence, the fall in the premium to skills can be linked to both market factors, which affected the demand for labor by skill, and state action in education spending. In addition, due to the demographic transition, the cohorts entering primary school became smaller over time, liberating resources for secondary schooling.

While less prominently than in Brazil, the change in the inequality of non-labor income per adult was equalizing too and the decomposition of the Gini suggests that it accounted for around

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<sup>35</sup> Legovini et al. (2005).

<sup>36</sup> By comparison, the average ratio for high-income OECD countries is close to 2.

15 percent of the decline. Within non labor income, a marginal increase in income from own businesses (profits), income from property (rents) and pensions was unequalizing, whereas that from remittances and transfers was equalizing, with the latter increasing its (equalizing) marginal contribution over time.<sup>37</sup> 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 Mexico’s signature conditional cash transfer program *Progresas/Oportunidades*. The lion’s share of the expansion in households receiving non-labor income was due to implementation of the *Progresas/Oportunidades* conditional cash transfer program in 1997. In fact, *Procampo* is not pro-poor/progressive in absolute terms (i.e., its concentration coefficient is positive); in contrast, *Progresas/Oportunidades* is an example of ‘redistributive efficiency’. With as little as 0.36 percent of GDP and 4 percent of total redistributive spending, *Progresas/Oportunidades* accounts for 18 percent of the change in the pre/post-transfers difference in the Gini coefficient.

With the policy shift from general price subsidies to targeted programs and from tertiary to basic education, government spending became increasingly more progressive from the mid - 1990s onward. But there is lots of room for improvement: fiscal incidence analysis indicates that more than 10 percent of redistributive spending (social spending plus consumer subsidies and agricultural support) is allocated to programs that are regressive (that is, they make the post-fiscal distribution of income more unequal than the distribution of market income).<sup>38</sup>

As with Argentina and Brazil, the decline in inequality in post-NAFTA Mexico can be explained by two main factors. First, the equalizing price (a fall in the premium to skills) and quantity effects of education. The decline in the skill premium, in turn, is the product of demand- and supply-side factors. The latter reflect the large effort made by the government to expand basic education, including the launching of the conditional cash transfer program *Progresas/Oportunidades*. The second factor was the expansion of targeted programs to the poor.

### **Peru**<sup>39</sup>

Between 1997 and 2009, Peru’s Gini coefficient fell from 0.5371 to 0.4908 or by 4.6 percentage points, a change that was both statistically significant and satisfied Lorenz-dominance (Figure 5). In contrast to Argentina, Brazil and Mexico, the evolution of the Gini showed ups and downs instead of a steady decline. In Peru, as in Argentina and in contrast to Brazil and Mexico, the decline in inequality overlapped with a period of fairly rapid economic growth.

Decomposing the change in the Gini coefficient for household per capita income indicates that changes in the distribution of non-labor income account for close to 90 percent of the decline in total inequality and that the changes in the distribution of labor income per worker were strongly unequalizing.<sup>40</sup> On the surface, then, it would seem that Peru’s story is very different from that of the other three countries. However, on closer examination one can see

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<sup>37</sup> The marginal contributions were estimated using the method proposed by Stark et al. (1986).

<sup>38</sup> Lustig et al. (2011).

<sup>39</sup> Based on Jaramillo and Saavedra (2010).

<sup>40</sup> Alejo et al. (2010).

that it is not. While the changes in the distribution of earnings per worker at the household level were unequalizing, the changes in earnings inequality for individual workers were equalizing.

A parametric decomposition of the changes in labor income inequality suggests that changes in the educational structure of the workforce (that is, the distribution of human capital) was equalizing.<sup>41</sup> Changes in returns to education (Figure 6) had an equalizing effect at the individual worker's level but were unequalizing at the household level. This suggests that the unequalizing effect of earnings at the household level is more related with assortative matching than with the dynamics of the labor market. It is possible that with more women becoming highly educated, men marrying better educated and better paid women became more pervasive and/or that married better educated women increased their participation in the labor force more than other women.<sup>42</sup> The quantity (equalizing) effect of education can be traced back to the expansion in coverage of basic education starting in the 1990s. The price (equalizing) effect of education—that is, the decline in the premium to skills—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, during this period, the share of workers with secondary school education increased (Figure 6). This expansion of the educational attainment of the labor force is the result of policies and household decisions from 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. Education inequality fell sharply (Figure 7). 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, “Peru’s education system is one of the most unequal in Latin America as measured by learning achievement on international tests.”<sup>43</sup>

As mentioned above, the decline in inequality in Peru is accounted for primarily by the decline in non-labor income inequality. Underlying the latter are changes in the size and distribution of government transfers, as it happened in Argentina, Brazil and Mexico. Over the last decade, per capita social spending increased by close to 50 percent and the proportion of social spending directed to the poor also rose. Transfers to the poor increased in the form of non-monetary transfers<sup>44</sup> and public services, and more recently, in the form of monetary transfers with the launch of Peru’s conditional cash transfer program *Juntos*. Social spending incidence analysis 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

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<sup>41</sup> Jaramillo and Saavedra (2010) apply the methodology used in Bourguignon *et al.* (2005). This methodology differs from that used in the sections on Brazil and Mexico in that the former simulates the entire distribution while the latter decomposes a specific indicator (the Gini, Theil, etc.). It consists of simulating counterfactual distributions by changing one factor at a time and holding other aspects constant. 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).

<sup>42</sup> This very interesting question requires further research beyond the scope of this paper.

<sup>43</sup> Jaramillo and Saavedra (2010).

<sup>44</sup> These mainly include health services and food transfers.

respective increases equaled 5.5, 4.3 and 2.6 percentage points, respectively. Changes in food transfers, in particular, accounted for the increase in the progressiveness of social spending. While transfers became more pro-poor, the changes at the other end of the distribution reveal that there are some problems in allocation priorities: while the share of non-monetary transfers in per capita household income fell for the 8<sup>th</sup> and 9<sup>th</sup> deciles it rose for the 10<sup>th</sup> (although by less than the average).

In sum, in Peru—like in Argentina, Brazil and Mexico-- there was also a decline in the premium to skills associated with the expansion of basic education and possible changes in the patterns of labor demand. However, this equalizing effect was more than offset by the unequalizing effect of a more concentrated distribution of labor income per worker at the household level. The causes for the rise in household labor income inequality remain to be investigated but changes in assortative matching and in the pattern of female labor force participation are the two leading candidates. The expansion of government transfers targeted to the poor was a powerful equalizing force in Peru.

### 3. Main Findings: A Synthesis

In the four countries, earnings and non-labor income inequality declined in the 2000s. Declines in earnings inequality appear to be associated with less steep returns to higher education, which reduced earnings per worker inequality, and much less so--or not at all--to changes in employment patterns.<sup>45</sup> In contrast to the 1990s, the premium to skills fell. Supply and demand forces appear to have been at play. Especially in Brazil, Mexico and Peru there have been notable changes in the composition of labor supply. As a result of an expansion of basic education,<sup>46</sup> low-skilled labor has become relatively scarce and therefore can command relatively higher returns/wages. In Argentina, the reduction in the premium to skills appears to be related not just to the change in the composition of skills but also to the employment effects of a booming economy and the wage-compressing effects of active labor market policies from a pro-union government.

In addition to the equalizing impact of the *price effect* of educational upgrading, the latter was equalizing through its *quantity effect* particularly in Brazil, Mexico and Peru. The significant expansion of basic education, in turn, seems to be associated with conscious government efforts including administrations from earlier periods. 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.<sup>47</sup>

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 the 2000s

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<sup>45</sup> Manacorda et al. (2010).

<sup>46</sup> 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.

<sup>47</sup> For more on *Bolsa Familia* and *Oportunidades*, see, for example Fiszbein et al. (2009).

suggests that the unequalizing impact of the skilled-biased technical change might have run its course. As a consequence, labor market dynamics became increasingly affected by the changes in the composition of labor supply by schooling level.

The reduction in the inequality of non-labor income was the second major factor behind the decline in inequality. Non-labor income includes quite disparate income sources: returns to capital (interests, profits and rents), private transfers (for example, remittances) and public transfers. The contribution of changes in returns to 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 particularly in the case of Mexico. However, what was new in the 2000s was the significant rise in importance of the equalizing contribution of government transfers. Large-scale conditional cash transfers programs such as *Bolsa Familia* (Brazil) and *Progresar/Oportunidades* (Mexico) had remarkable redistributive power. These programs are a small share of total government social spending but go a long way in terms of redistributing income to the bottom of the distribution.<sup>48</sup>

### **Concluding remarks**

During the first decade of this century, income inequality in most countries in Latin America has declined. The decline has been non-trivial, statistically significant and robust to changes in the time interval, inequality measure, definition of income and data source. Our in depth analyses for Argentina, Brazil, Mexico and Peru reveal two main underlying factors: a fall in the premium to skills and more progressive government transfers. The fall in the skill premium seems to be associated with a push in the coverage of basic education which made low-skilled labor relatively less abundant and changes in labor demand. Through both quantity and price effects, the expansion of education has been equalizing. The distribution of human capital became more equal and the gap in returns to schooling by level narrowed. Using Tinbergen's language, in the race between education and technology, the former took the lead.

The redistributive momentum may be hard to sustain, however. While educational attainment has become significantly more equal, the same cannot be said about the distribution of the quality of education. The experience of the United States should serve Latin America as a warning of what may be yet to come.<sup>49</sup> In the United States, earnings inequality rose significantly since the 1980s because the premium to skills increased. Returns to skills went up because there was a slow-down in the rate at which workers with post secondary education came into the labor market (and to a lesser extent because of skill-biased technical change). The low quality of education in preceding levels generated many high school graduates who were not "college ready" and, thus, educational upgrading stalled. Equity cannot be taken for granted. It requires "hard work" both from policymakers and the polity.

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<sup>48</sup> Beyond targeted transfers, government social spending became more progressive in the 2000s. Spending on health, education, nutrition and basic infrastructure (electricity and water and sanitation, for example) became 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.

<sup>49</sup> Goldin and Katz (2008).

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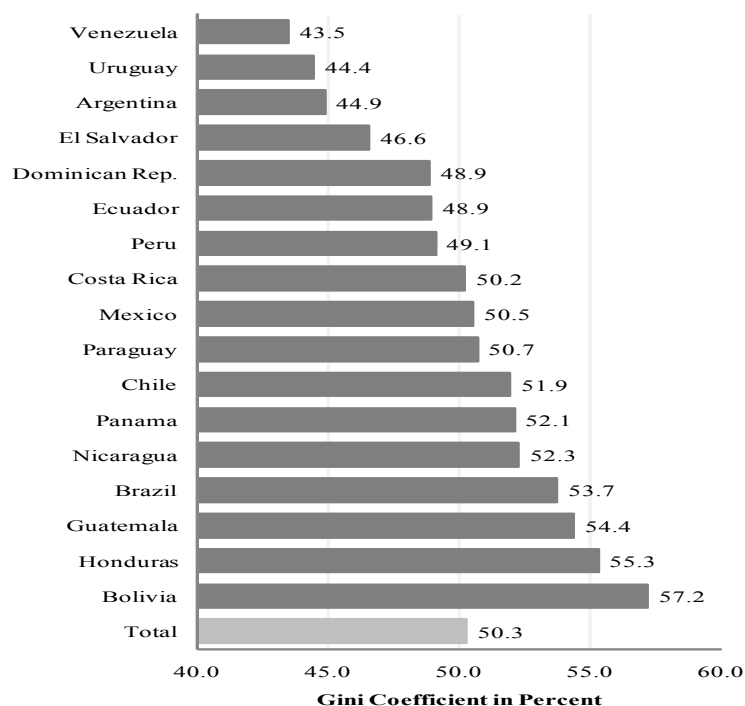


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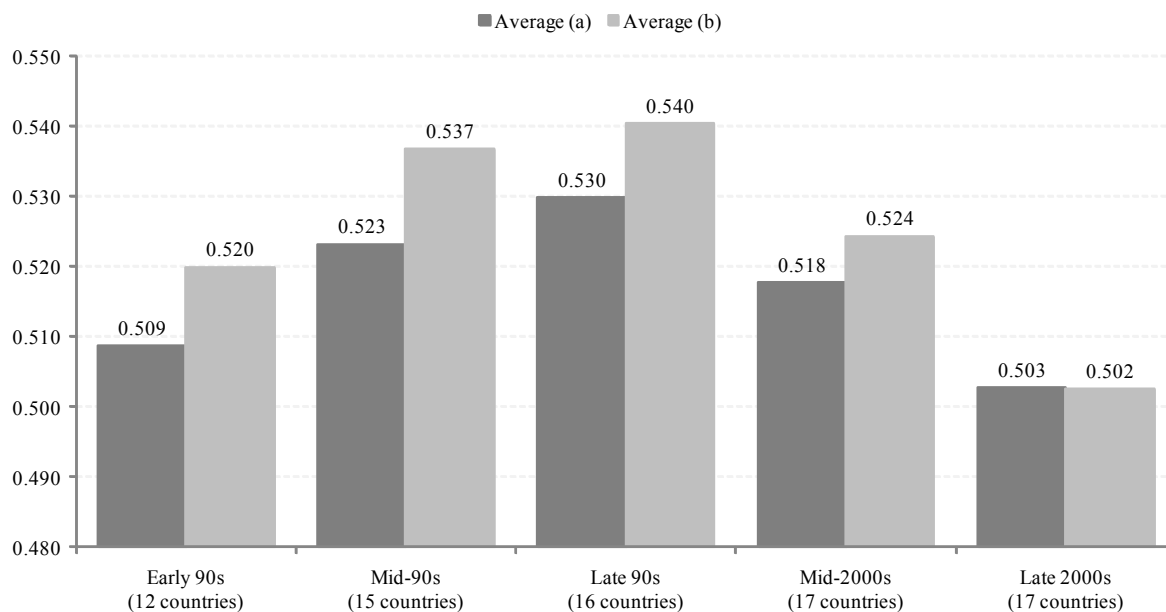
Figure 1 - Inequality in Latin America: circa 2009



Source: SEDLAC(CEDLAS and The World Bank), March 2011

(<http://sedlac.econo.unlp.edu.ar/eng/>)

Figure 2 – Inequality in Latin America: 1990s-2000s (Gini coefficient)

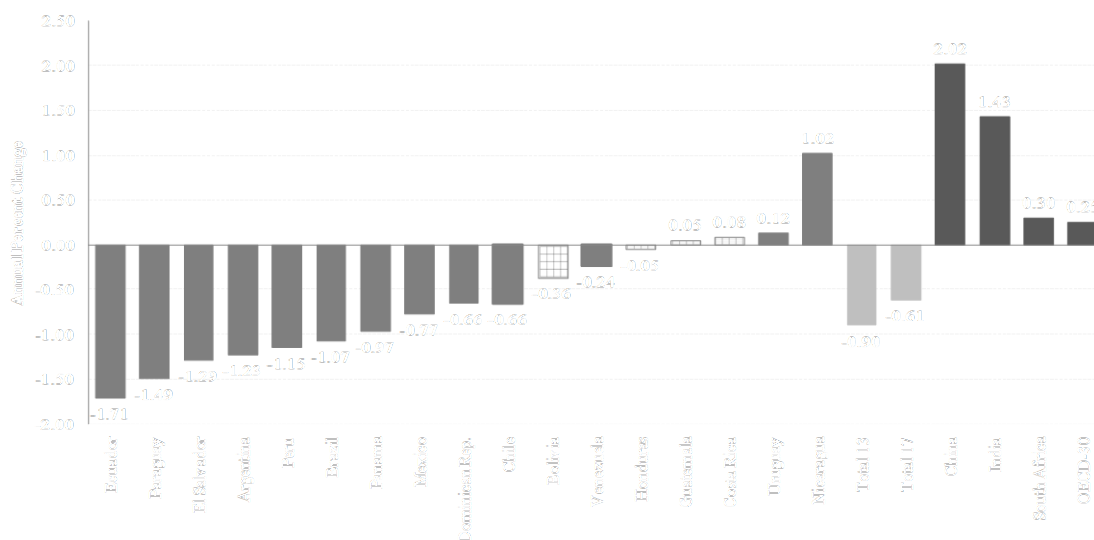


Source: Authors' calculations based on data from SEDLAC (CEDLAS and The World Bank), March 2011

(<http://sedlac.econo.unlp.edu.ar/eng/>)

Note: Unweighted averages. (a) for all countries; (b) for countries in which inequality declined in the 2000s

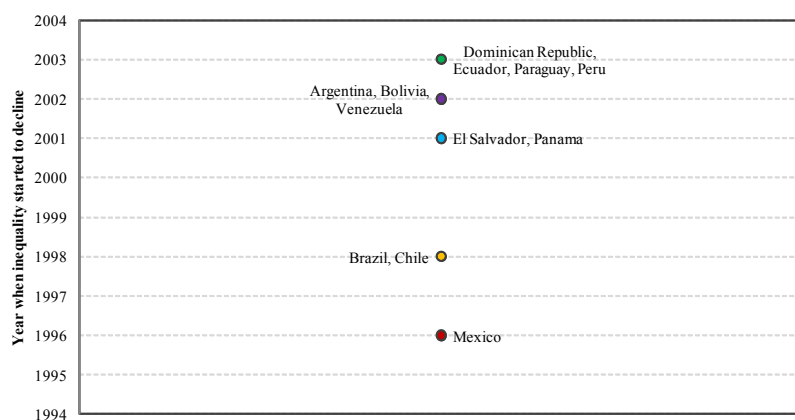
Figure 3 – Declining Inequality in Latin America by Country: 2000-2009 (annual % change in Gini)



Source: Authors' calculations based on data from SEDLAC (CEDLAS and The World Bank), March 2011 (<http://sedlac.econo.unlp.edu.ar/eng/>) for Latin American countries; and OECD (2010) for China, India, South Africa and OECD-30.

Note: Solid bars represent cases where changes are statistically significant based on SEDLAC's estimates. Data for Argentina and Uruguay are for urban areas only. In Uruguay, urban areas covered by the survey represent 80 percent of the total population; in Argentina, they represent 66 percent. 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 (thirteen countries in which inequality fell). The years used to estimate the percentage change are as follows: Argentina (2009-00), Bolivia (2007-01), Brazil (2009-01), Chile (2009-00), Costa Rica (2009-01), Dominican Republic (2009-00), Ecuador (2009-03), El Salvador (2008-00), Guatemala (2006-00), Honduras (2009-01), Mexico (2008-00), Nicaragua (2005-01), Panama (2009-01), Paraguay (2009-02), Peru (2009-01), Uruguay (2009-00), and Venezuela (2006-00). Using the bootstrap method, with a 95 percent significance level, the changes were not found to be statistically significant for the following countries: Bolivia, Costa Rica, Guatemala, and Honduras (represented by grid bars in the figure). The years used in non-Latin American countries are as follows: China (1993-Mid 00s), India (1993-Mid 00s), South Africa (1993-08), and OECD-30 (Mid 80s-Mid 00s).

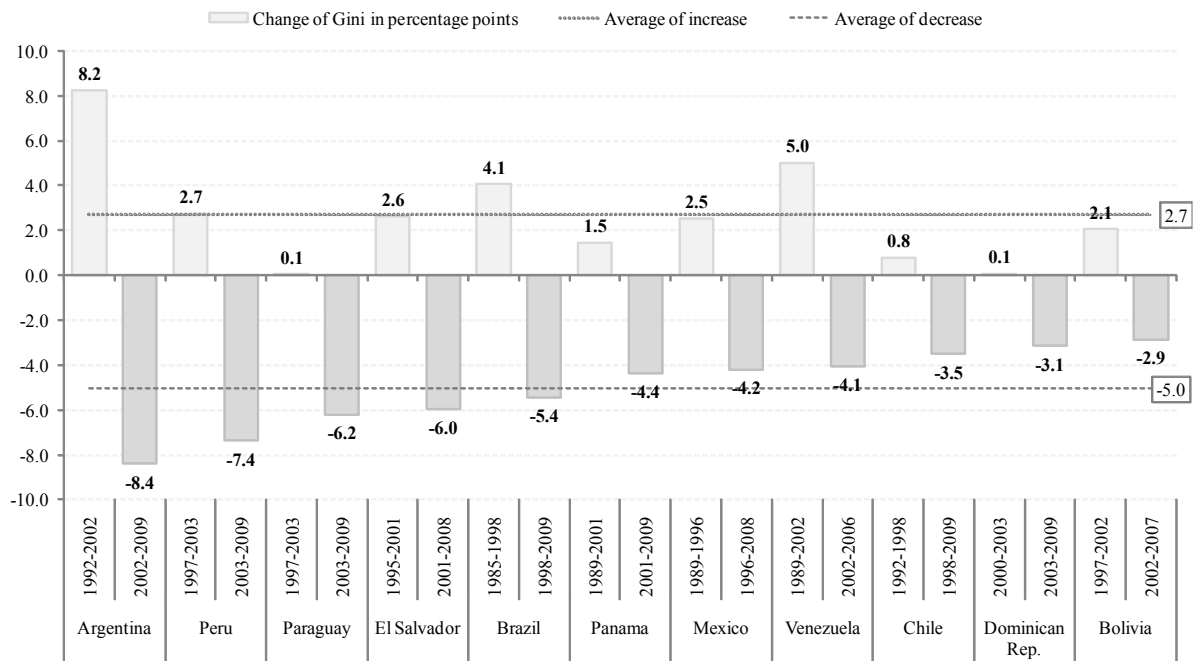
Figure 4 – First Year in Which Inequality Started to Decline



Source: Authors' based on data from SEDLAC (CEDLAS and The World Bank), March 2011 (<http://sedlac.econo.unlp.edu.ar/eng/>)

Note: includes countries in which the decline in inequality has been sustained for several years.

Figure 5 – The Rise and Fall in Inequality  
(changes in the Gini coefficients in percentage points)



Source: Authors' calculations based on data from SEDLAC (CEDLAS and The World Bank), March 2011

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

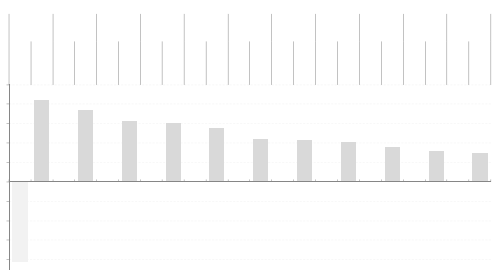
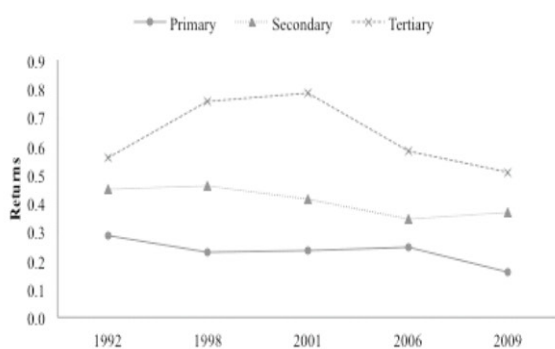
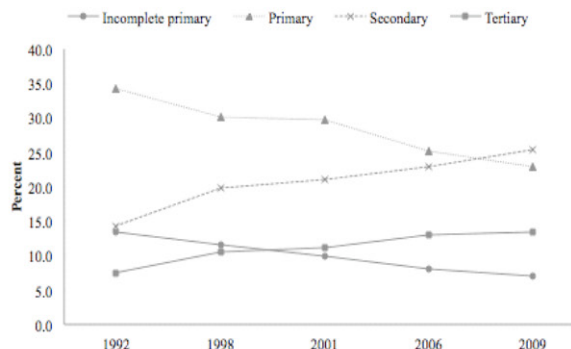


Figure 6 - Returns to Education and Composition of Labor Force by Schooling Level: Argentina, Brazil, Mexico and Peru

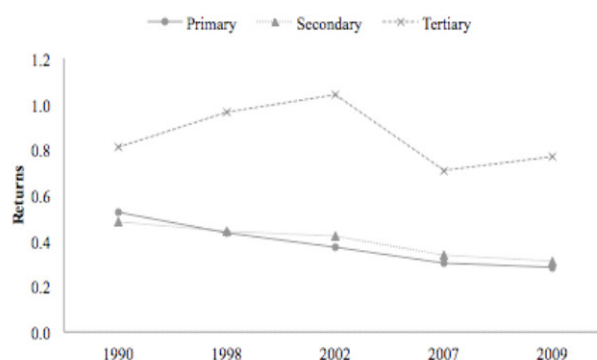
Returns on Education for Argentina: 1992-2009



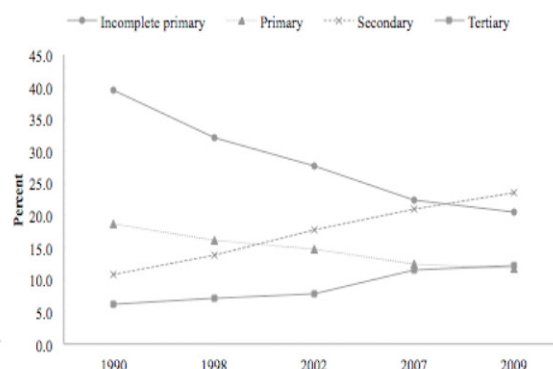
Composition of Adult Population by Educational Level for Argentina: 1992-2009



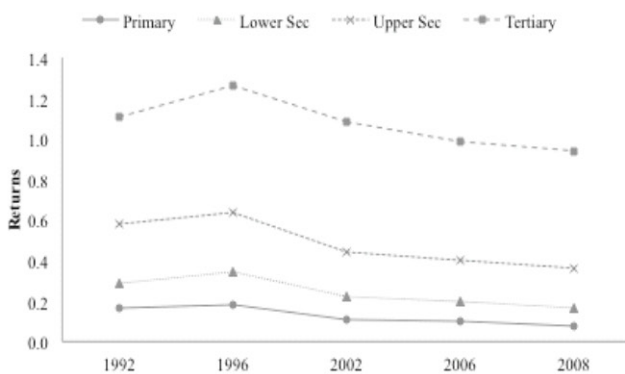
Returns on Education for Brazil: 1990-2009



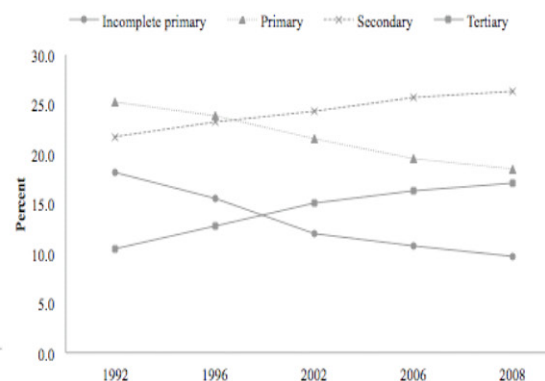
Composition of Adult Population by Educational Level for Brazil: 1990-2009



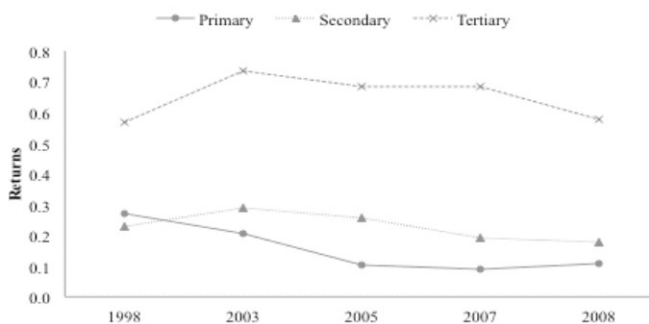
Returns on Education for Mexico: 1992-2008



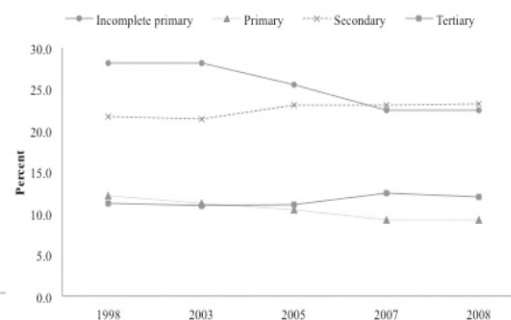
Composition of Adult Population by Educational Level for Mexico: 1992-2008



Returns on Education for Peru: 1998-2008



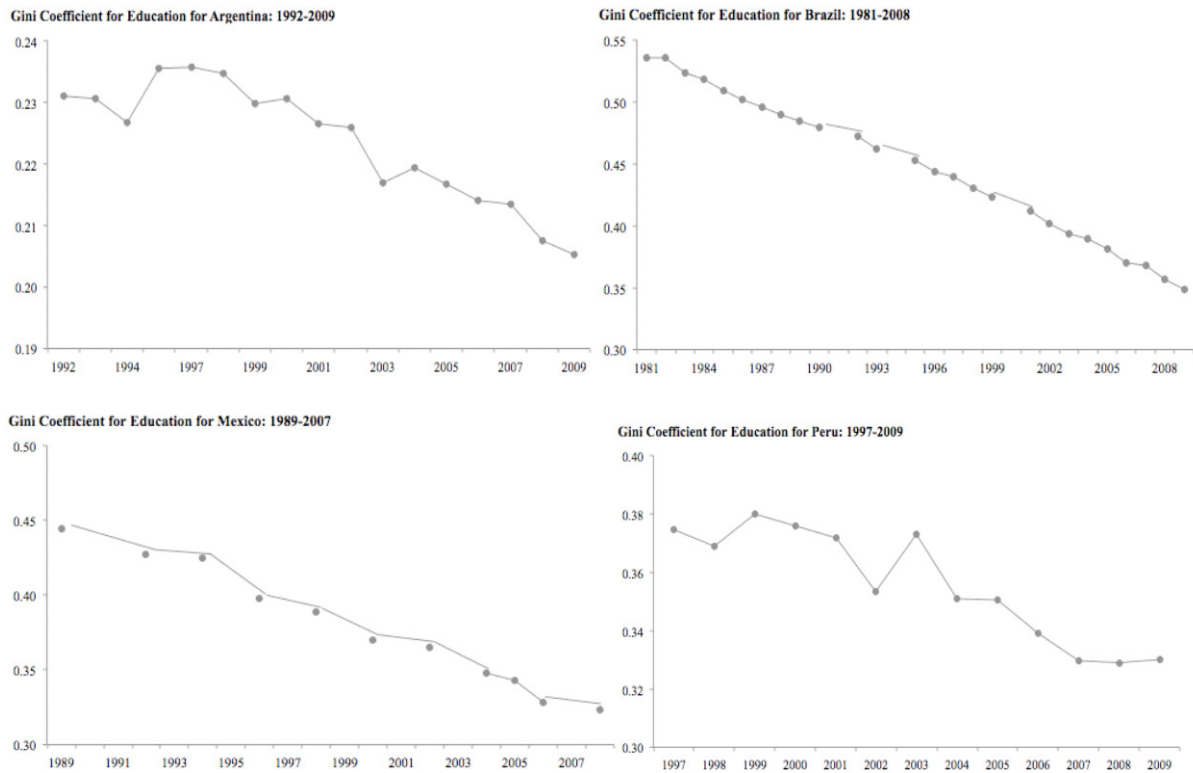
Composition of Adult Population by Educational Level for Peru: 1998-2008



Source: SEDLAC (CEDLAS and The World Bank), March 2011

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

Figure 7 - Schooling Inequality: Argentina (urban), Brazil, Mexico and Peru (Gini Coefficients)



Source: SEDLAC (CEDLAS and The World Bank), March 2011  
<http://sedlac.econo.unlp.edu.ar/eng/>