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What is Behind Latin America's Declining Income Inequality?

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Abstract

Income inequality in Latin America has declined during the last decade, in contrast to the experience in many other emerging and developed regions. However, Latin America remains the most unequal region in the world. This study documents the declining trend in income inequality in Latin America and proposes various reasons behind this important development. Using a panel econometric analysis for a large group of emerging and developing countries, we find that the Kuznets curve holds. Notwithstanding the limitations in the dataset and of cross-country regression analysis more generally, our results suggest that almost two-thirds of the recent decline in income inequality in Latin America is explained by policies and strong GDP growth, with policies alone explaining more than half of this total decline. Higher education spending is the most important driver, followed by stronger foreign direct investment and higher tax revenues. Results suggest that policies and to some extent positive growth dynamics could play an important role in lowering inequality further.

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I. INTRODUCTION

In the last decade, Latin America (LA) has enjoyed strong economic growth coupled with improved social indicators.[1] The region's real GDP has grown by an annual average of over 4 percent, almost twice the rate of the 1980s and 1990s, while unemployment declined steadily to multi-year lows; public debt and inflation also declined significantly. Social indicators also improved—poverty rate, income inequality and polarization declined markedly. The region's decline in income inequality is in contrast to other emerging and developed regions which have experienced rising income inequality despite buoyant economic conditions over the last decade. The downward trend in income inequality in LA is tempered however, by the fact that the region remains the most unequal in the world. Also worrisome is the fact that the latest data point to a small reversal of the declining trend in inequality in some countries, such as Bolivia, Ecuador, Mexico, Paraguay, and Peru; though it is too soon to know if this reversal suggests an emerging trend.

Understanding the key drivers behind the decline in income inequality in Latin America is therefore particularly important. Countries that effectively address income disparities tend to experience more harmonious civil and political societies, and typically have more sustainable growth (Berg and Ostry, 2011; and Ostry, Berg, and Tsangarides (2014)).[2] Indeed, inequality could limit a country's growth potential and could result in higher poverty during bad economic times (see Jaumotte, Lall, and Papageorgiou (2008) for more details). In addition, in societies with stagnant growth, inequality could lead to a backlash against economic liberalization and protectionist pressures, limiting the ability of economies to benefit from globalization. Some also argue that rising income shares at the top of the income distribution could lead to credit booms and eventually to financial crises.

There is no consensus in the literature on the causes behind the decline in income inequality in Latin America; moreover, statistical noise created by variations in inequality surveys force researchers to be cautious when drawing conclusions from data trends. Notwithstanding these concerns, studies often cite structural reforms and increased social spending, a decline in skill premia, and strong macroeconomic policies as major contributing factors in the inequality decline in Latin America. Specifically, Reynolds (1996) emphasizes higher social spending on education and healthcare as primary drivers of Latin America's declining income inequality. Others point to the reduction in educational inequality and skill premia amid rising supplies of skilled labor and institutional reforms (World Bank, 2011; and Cornia,

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[1] Unless otherwise noted, Latin America in our analysis refers to Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

[2] More unequal societies typically have limited investments in human capital given the high opportunity cost of studying and credit market imperfections. In addition, inequality is typically associated with higher political instability that results in lower physical capital accumulation and thus GDP growth. [3] While there are various measures of inequality, including wealth, opportunities and gender, our focus is primarily on income inequality. For a broader discussion of inequality issues, please refer to IMF (2014a).

2012). Cornia (2012) concludes that Latin America's inequality decline was driven by more equitable macroeconomic, tax, social expenditure and labor market policies; and Soares et al. (2009) find that conditional cash transfers accounted for 15-21 percent of the inequality reduction in Brazil, Mexico and Chile. Goñi, López and Servén (2008), on the other hand, find that in most Latin American countries the fiscal system is of little help in reducing income inequality while Bucheli and others (2012) find large disparities on the redistributive effects of in-kind benefits and tax policies, despite a widespread decline in income inequality.

There are also mixed views about the importance of external factors in explaining the recent decline in income inequality. Cornia (2012) finds that terms of trade, migrant remittances, foreign direct investment (FDI) and world growth played a small role in explaining the decline in income inequality in a group of 18 Latin American countries. In contrast, Coble and Magud (2010) find that improvements in terms of trade have actually widened the Chilean skill premium and thus raised income inequality.

The purpose of this study is two-fold.

- *First*, we document developments in social indicators (e.g., income inequality, access to education and basic services, poverty and polarization) in recent years by looking at historical trends and cross-regional comparisons.[3] We also investigate if there has been a convergence of income levels across population segments in Latin America, an indication of a rising middle class.

- *Second*, in contrast to most studies which analyze the causes of income inequality for one or a small group of countries, we explore possible drivers behind the decline in income inequality in Latin America as a whole. To undertake this task, we utilize an array of methodologies—including correlation and econometric techniques. To start, we look at simple correlations between changes in policy variables and changes in income inequality in Latin America, and then investigate econometrically in a panel regression for a large group of emerging and developing countries the importance of policies, GDP growth, and external factors in explaining the decline in income inequality—an issue that, as already noted, remains highly contested.

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[3] While there are various measures of inequality, including wealth, opportunities and gender, our focus is primarily on income inequality. For a broader discussion of inequality issues, please refer to IMF (2014a).

Our approach has two important advantages. *First*, we deploy several methodologies to ensure the robustness of our results. *Second*, we extend the sample beyond Latin American countries to offer a more informed perspective into what drives income inequality, while providing additional degrees of freedom in our econometric analysis.[4] This is a novelty compared to most of the studies analyzing income inequality in LA which rely primarily on correlations and only concentrate on a small sample of LA countries.

Our main results are as follows:

Latin America and Sub-Sahara Africa are the only regions that have experienced declines in income inequality in the last decade. Latin America saw a decline in its Gini coefficient of around 3 Gini points over the last decade; it also experienced declining trends in poverty and polarization rates since the 1990s and saw a large surge in its middle class. However, Latin America remains the most unequal region in the world, with education and health outcomes less favorable than in other regions with comparable spending levels.

Notwithstanding the inherent limitations of the data set and of cross-country regression analysis more generally, we find that well-designed policies explain more than half of the decline in income inequality in Latin America. Our econometric analysis suggests that higher education spending is the most important contributor to the decline in income inequality (explaining almost one-fourth of the total decline) followed by higher FDI (partly reflecting strong economic fundamentals), and higher tax revenue. We find that appreciating exchange rates have a small but dampening effect on equality. Our results quantitatively support the assertions that policies have been important in explaining the decline in LA's income inequality (Reynolds, 1996; and World Bank, 2011). We also confirm the existence of the Kuznets curve, which suggests that economic growth has been conducive to declining income inequality, thought (as is typical in the literature) we find that its impact has been limited. The correlation analysis for our sample of Latin American countries suggests that tax revenues (including from direct and property taxation) and spending on education are negatively correlated with inequality.

The remainder of the paper is organized as follows. Section II provides stylized facts on the changes in social indicators in Latin America from a historical perspective as well as in cross country comparisons. Section III analyzes the drivers behind Latin America's changes in income inequality using correlation and econometric analyses; Section IV concludes.

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[4] We control for country-specific differences (e.g., institutional characteristics) by including country-fixed effects.

## II. SOCIAL INDICATORS: SOME STYLIZED FACTS

A. The Good News: Considerable Improvements in Social Indicators

During the last decade, income inequality, poverty and polarization rates have declined significantly in Latin America, while the middle class surged (Figure 1).[5] The Gini coefficient—the most widely used measure of income inequality—has declined by an (unweighted) average of around 3-4 Gini points in the last decade; now hovering at around 50 Gini points (out of 100, World Bank, 2014).[6] Data from the Socio-Economic Database in Latin America and the Caribbean (SEDLAC) suggest that the average decline in the Gini coefficient over the last decade is around 4 Gini points while World Bank data suggest an average decline of around 3 Gini points.[7]

The decline in income inequality is impressive, given the widening income inequality in other emerging market and advanced economies (Figure 2). Poverty is also on the decline in most LA countries, despite the recent global financial crisis. In addition, almost half of Latin America's population is now regarded as middle class which is up from a mere 20 percent of the population just a decade ago (Figure 1).[8]

We also investigate how the change in income inequality in LA compares to the developments in other regions over the last two decades. To undertake this analysis we document episodes of large changes (increases and decreases) in the Gini coefficient using a

Figure 1. Latin America: Poverty, Polarization, Inequality and the Middle Class since 2000[1]
(*Simple average*)
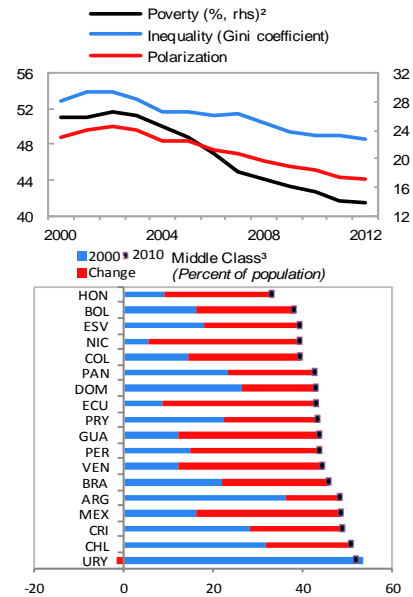
Sources: PovcalNet; SEDLAC; World Bank, *World Development Indicators*; and authors' calculations.
[1] Includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela.
[2] Poverty line of US$2.5 per day.
[3] Middle class is defined as people with per capita income between $10-$50 per day (2005 PPP), as defined by Milanovic, Branko and Yitzhaki, Shlomo (2002), "Decomposing World Income Distribution: Does the World Have a Middle Class?", *Review of Income and Wealth*, International, Vol. 48(2).

[5] Polarization measures how distant the rich and poor are from one another. (Gigliarano and Muliere, 2012).

[6] Like most studies we take the average Gini coefficient across many countries (as in IMF (2014a)), which essentially assumes that we can rank (and thus compare) income of households in different countries (see for example, Deaton (2010, 2013) and Deaton and Heston (2010) for a discussion of the limitations of this approach).

[7] In our econometric analysis and when undertaking cross-country comparisons, we utilize the latter database that homogenizes differences in household surveys across time and countries and uses, when available, after tax and transfers Gini estimates. In contrast, SEDLAC data refer to the distribution of household's per capita income, taking into account family size.

[8] Following Milanovic and Yitzhaki (2002) we define as middle class people with per capita income between $10-$50 per day (2005 PPP).

sample of over 170 countries for the period 1990–2012. We define "large" as a change in the Gini coefficient of at least 3 Gini points between the 1990s and the latest available year.

Figure 2. Developments in Inequality and Poverty since 2000
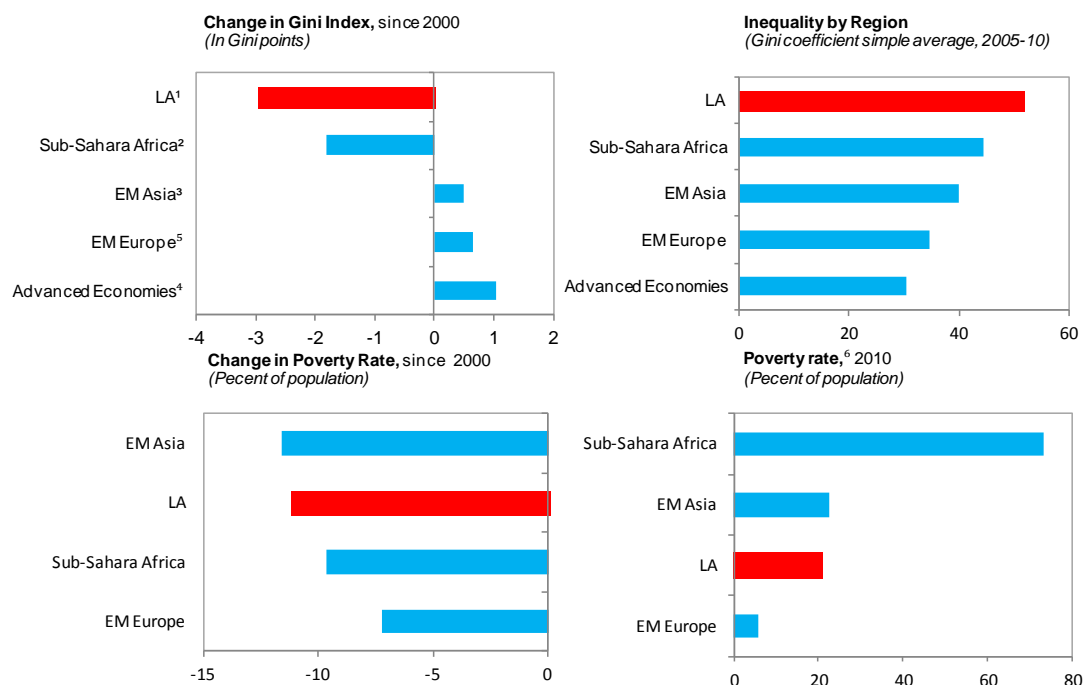
Sources: OECD; World Bank, *World Development Indicators*; and authors' calculations.
[1] Includes Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela RB.
[2] Includes Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Swaziland, Tanzania, Uganda, and Zambia.
[3] Includes China, India, Indonesia, Philippines, Malaysia, Singapore, and Thailand.
[4] Includes Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Republic of Korea, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.
[5] Includes Bulgaria, Croatia, Estonia, Georgia, Hungary, Latvia, Lithuania, Poland, Romania, Turkey, and Ukraine.
[6] National coverage of poverty headcount (% of population living in households with consumption or income per person below the poverty line of $76 per month ($2.5 per day)) for all countries.

Table 1 suggests that out of a sample of 29 countries that have experienced large declines in income inequality over the last two decades, almost half of them are actually located in Latin America.[9] Table 2 reports countries with large increases in income inequality, this sample includes Honduras and Costa Rica. Particularly worrisome is the fact that countries with significant increases in income inequality have actually experienced strong growth momentum during the same period.

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[9] Argentina's Gini coefficient increased dramatically following the debt crisis in the early 2000s and then subsequently declined. For a data disclaimer on Argentinean data please look at Appendix 2.1 in IMF (2014b).

Table 1. Countries with large decline in Income Inequality[1]	
	Change (in Gini points)
Mali	-17.5
Peru	**-13.1**
Bolivia	**-11.6**
Kyrgyz Republic	-11.5
El Salvador	**-9.8**
Ecuador	**-9.7**
Swaziland	-9.2
Burkina Faso	-9.0
Armenia	-8.9
Nicaragua	**-8.7**
Senegal	-7.5
Brazil	**-7.4**
Ukraine	-6.7
Malawi	-6.4
Central African Rep.	**-5.0**
Kazakhstan	-5.0
Mexico	**-4.9**
Tunisia	-4.9
Argentina	**-4.8**
Paraguay	**-4.7**
Burundi	-4.6
Jordan	-4.5
Niger	-4.3
Chile	**-4.2**
Thailand	-4.0
Russian Federation	-3.9
Panama	**-3.7**
Moldova	-3.5
Colombia	**-3.1**

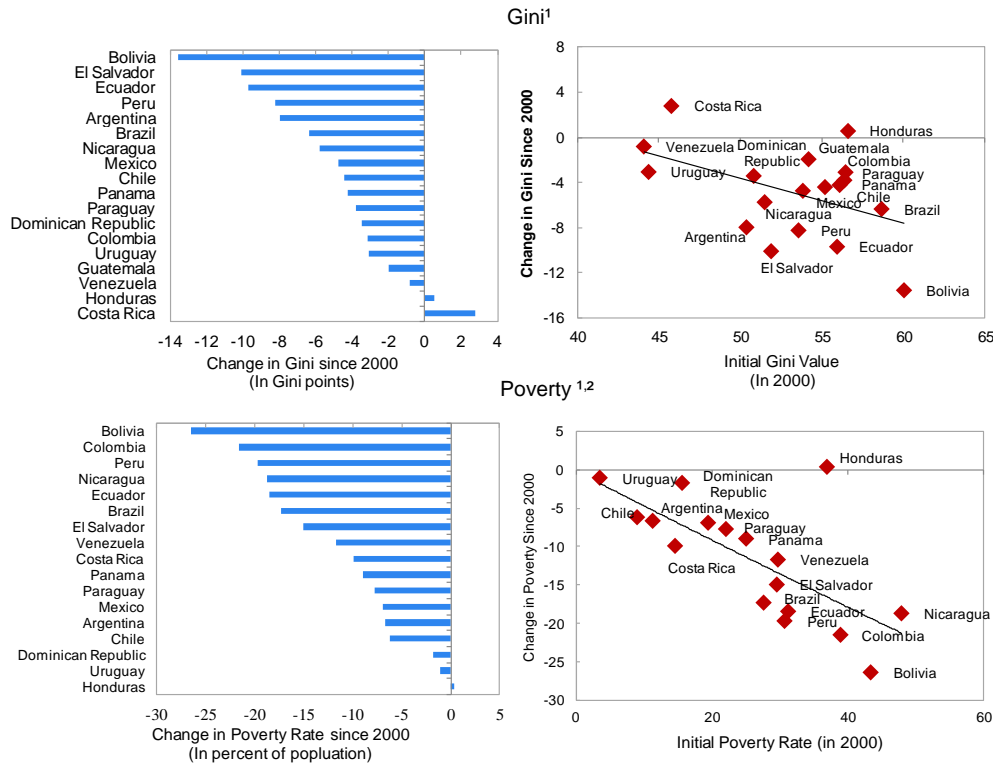| Table 2. Countries with Large Increase in Income Inequality[1]	
	Change (in Gini points)
Macedonia, FYR	15.4
Indonesia	8.4
Croatia	6.4
China,P.R.: Mainland	6.3
Zambia	5.5
Lithuania	5.5
Albania	5.4
South Africa	5.2
Hungary	4.3
Laos	4.1
Latvia	3.8
Tanzania	3.8
Costa Rica	**3.4**
Uganda	3.4
Slovak Republic	3.4
Nigeria	3.1
India	3.1
Honduras	**3.1**

Sources: SEDLAC; World Bank, *World Development Indicators*; and authors' calculations.
[1]Latest value versus average Gini value in the 1990s. Countries with at least 3 Gini points increase.

These favorable general trends mask important cross-country disparities (Figure 3). Honduras and Costa Rica actually experienced rising Gini coefficients over the last decade, with Honduras also experiencing a rising poverty rate. Klasen and others (2012) suggest that the increase in inequality and poverty in Honduras is explained by the rise in the dispersion of labor incomes in rural areas between the tradable and non-tradable sectors (amid overvalued currency and poor agricultural exports), combined with highly segmented labor markets and poor overall educational progress. A large informal sector, widening wage gaps and a large unskilled labor force given the economic crisis of the 1980s that deterred many people from finishing high school are often cited as the reasons driving the increase in inequality in Costa Rica (Hidalgo, 2014).

Figure 3 also presents a simple correlation analysis for LA countries which suggests that there is a conditional convergence in income inequality—countries with higher income inequality tend to experience larger declines in their Gini coefficient. Similarly, there appears to be conditional convergence for poverty rates as well.

Figure 3. Latin America: Change in Gini Coefficient and Poverty Rates since 2000

Gini[1]

Poverty [1,2]

Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations.
[1] The change is calculated as the difference between the latest available observation and the data in 2000.
[2] Poverty headcount refers to the poverty line of US$ 2.5 (PPP) per day.

Figures A1−A3 in the Annex show the convergence (narrowing of the income gap) in households' per capita income over the last decade by depicting the shares of total income earned by the highest and lowest earners. These figures, however, also document the rising inequality in Honduras and Costa Rica over the last decade with the income gap between the highest and lowest earners rising.

To explore further the decline in income inequality in most Latin American countries in recent years, we construct growth incidence curves (GIC; Ravallion and Chen, 2003). The GIC indicates the growth rate in income between two points in time (over the last decade in our analysis) at each decile of the distribution (Figures A4−A6 in the Annex). If inequality falls, then the distribution of growth rates must be a decreasing function of the deciles, meaning that lower-income households enjoy faster growth rates in their income than higher-income households.

Using data from the Socio-Economic Database for Latin America and the Caribbean (SEDLAC and The World Bank, 2014), we observe that in most Latin American countries the distribution of income growth rates is a decreasing function of the deciles, confirming that inequality has fallen over the last decade (Honduras is a notable exception).

As extensively documented in the literature, declining income inequality in LA coincided with declining skill premia in most countries over the last decade (Figure 4). In 2012 high-

skilled workers earned on average 2.7 times the wages of low-skilled workers (compared to 4 times more in 2000). Lopez-Calva and Lustig (2010) and Azevedo et al. (2013) posit that the most important factor behind the decline in the returns to education has been an increase in the relative supply of workers with completed secondary and tertiary education—resulting from significant educational upgrading that took place in the region during the 1990s (Cruces et al., 2011). The significance of education spending in explaining the decline of income inequality will be examined in Section

Figure 4. Latin America: Skill Premium
(Ratio of wages for higher- and lower-skilled workers)

Sources: SEDLAC; and authors' calculations.
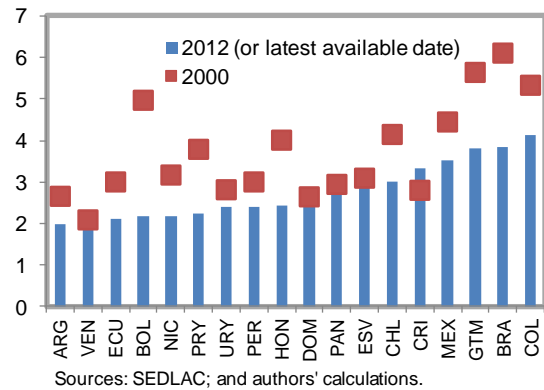
B. The Bad News: Still a Long Way to Go

The recent improvements in social indicators cannot mask the social challenges of Latin America. Despite the declining trend in income inequality and, in most cases, the convergence in incomes, Latin America remains the most unequal region in the world (Figure 2). Income disparities are staggering—the richest 10 percent of households in Latin America possess on average 37 percent of the total per capita income while the poorest 10 percent possess a mere 1.5 percent, i.e., the richest households earn 25 times more than the poorest households (Figure 5). The difference in incomes between the lower- and higher-income households varies significantly across the region from 55 times more (Honduras) to 15 times more (Uruguay and El Salvador) (Figures A7–A9).

It is also troubling that income inequality has risen, albeit slightly, in some countries over the last few years, possibly reflecting the effects of the global financial crisis and the recent growth slowdown (Honduras, Mexico, Peru), and idiosyncratic factors (e.g., drought in Paraguay). Figures A1-A3 document the recent increase in inequality with a divergence in the income shares between the highest- and lowest-income households.

Figure 5. Latin America: Distribution of Per Capita Household Income
(Simple average, by decile)

Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations.
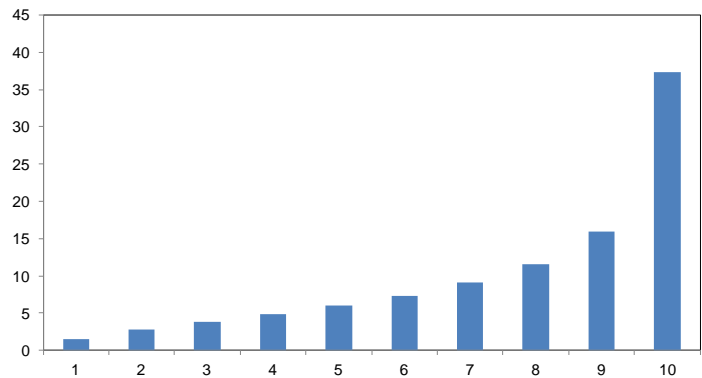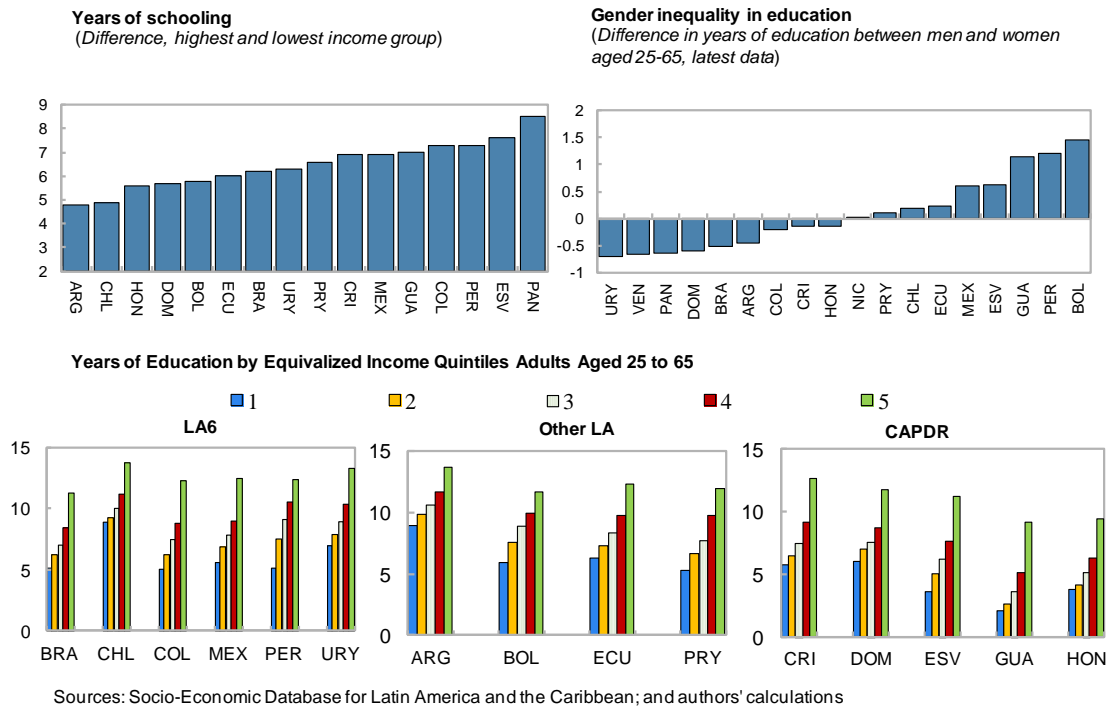
Latin America is also highly unequal in terms of access to opportunities such as education and basic services such as sewage and health. In the remaining section we compare Latin America's performance vis-à-vis other regional comparators in terms of access to education, basic services, and health.

Education

The Gini coefficient for the distribution of years of education is high in many countries of the region, notably in Panama and Ecuador. This implies that years of schooling between high- and low-income households vary significantly (from 5 years in Argentina to 8½ years in Panama, Figure 6). The disparities in years of schooling also prevail if one considers gender differentials. Figure 6 shows that in half of Latin America countries considered, men have more years of schooling than women (positive difference).

Figure 6. Latin America: Inequality of Education

Years of schooling
(*Difference, highest and lowest income group*)

Gender inequality in education
(*Difference in years of education between men and women aged 25-65, latest data*)

Years of Education by Equivalized Income Quintiles Adults Aged 25 to 65

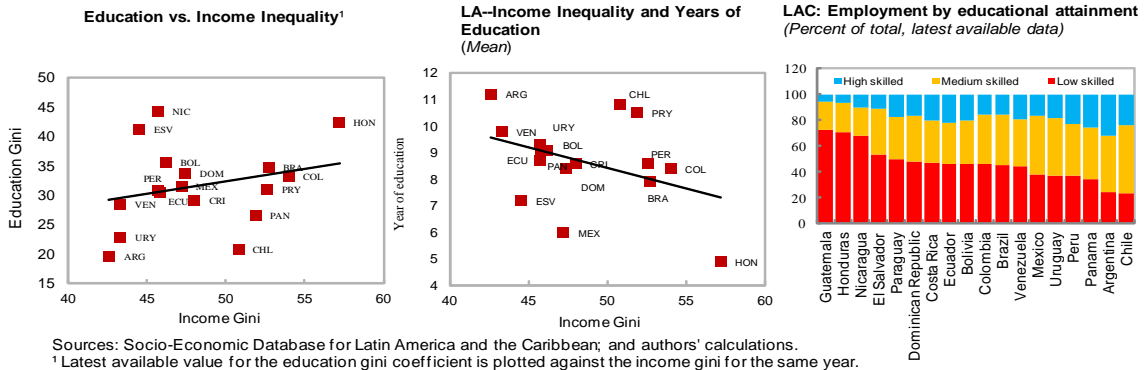Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations

We also find that educational inequality is strongly correlated with income inequality implying that economies with unequal income distribution also have unequal access to education. In addition, inequality in education and the region's low performance in international test scores might be impacting the skill composition of LA's labor market (Figures 7a–7b). According to the Socio-Economic Database in Latin America and the Caribbean (SEDLAC) in many economies, especially in Central America, around three-quarters of the population is low-skilled.

Infrastructure

Infrastructure quality is weak for most Latin American countries in international comparisons (Chile is a notable exception, Figure 7a). There are also large disparities within Latin

Fig 7b. Latin America: Income, Education Inequality, and Skills Composition

Education vs. Income Inequality[1]

LA--Income Inequality and Years of Education
(*Mean*)

LAC: Employment by educational attainment
(*Percent of total, latest available data*)

Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations.
[1] Latest available value for the education gini coefficient is plotted against the income gini for the same year.

America in the proportion of the population with access to basic services, such as sewage, ranging from 10 percent in Paraguay to almost universal coverage in Chile (Figure 8). Within country disparities also prevail; for example in Peru only 20 percent of the lower-income households have access to sewage compared to almost 90 percent of the higher-income households.

Figure 7a. LA6: Infrastructure Performance and Educational Outcomes

Educational Performance in Mathematics and Public Spending on Education
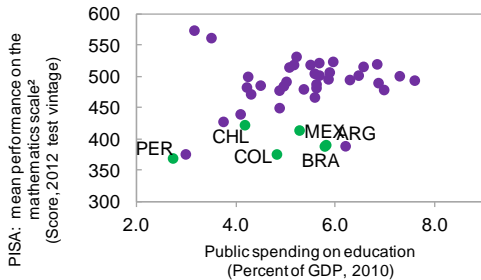
Structural Performance Indicators, Percentile Ranks[1]
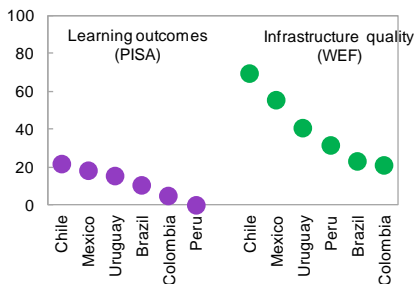
Sources: OECD, *PISA (2012);* World Bank, *World Development Indicators;* World Economic Forum, *Global Competitiveness Report (2013–14);* and IMF staff calculations.
[1] The scale reflects the percentile distribution in all countries for each respective survey; higher scores reflect higher performance; PISA: Program for International Student Assessment; WEF: World Economic Forum.
[2] PISA: Program for International Student Assessment.

Health

While indicators of access to health services are more favorable in LA than in Sub-Sahara Africa and emerging Asia, the region lags behind indicators in emerging Europe. Data from the World Health Organization (2014) suggest that skilled physicians often do not attend births in the least wealthy households, in contrast to the experience in emerging Europe (Figure 9). In addition, inequality between rural and urban regions is much higher in LA than in emerging Europe in terms of much higher under-five mortality rate. Other health outcomes, such as stunting among children, are also less positive in Latin America that in emerging Europe, despite similar health spending levels.
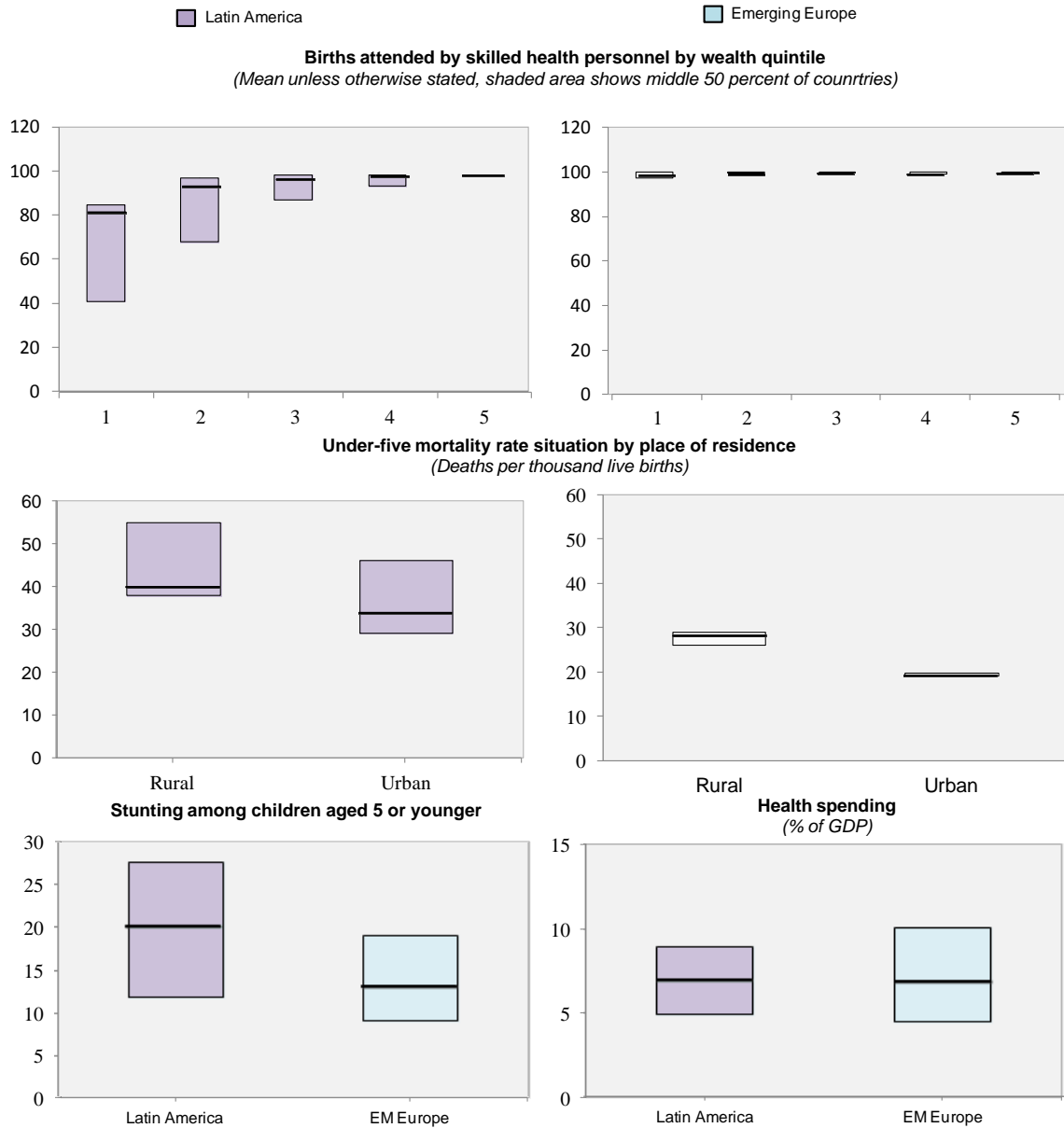
Poverty also remains high in LA with almost 85 million people living below $2.5 per day (after adjusting for purchasing power), according to World Bank data. Poverty disparities are vast ranging from 3 percent (Uruguay) to 43 percent (Nicaragua).

Figure 8. Infrastructure: Access to Sewage
(In percent of population, per income quintile unless otherwise noted)
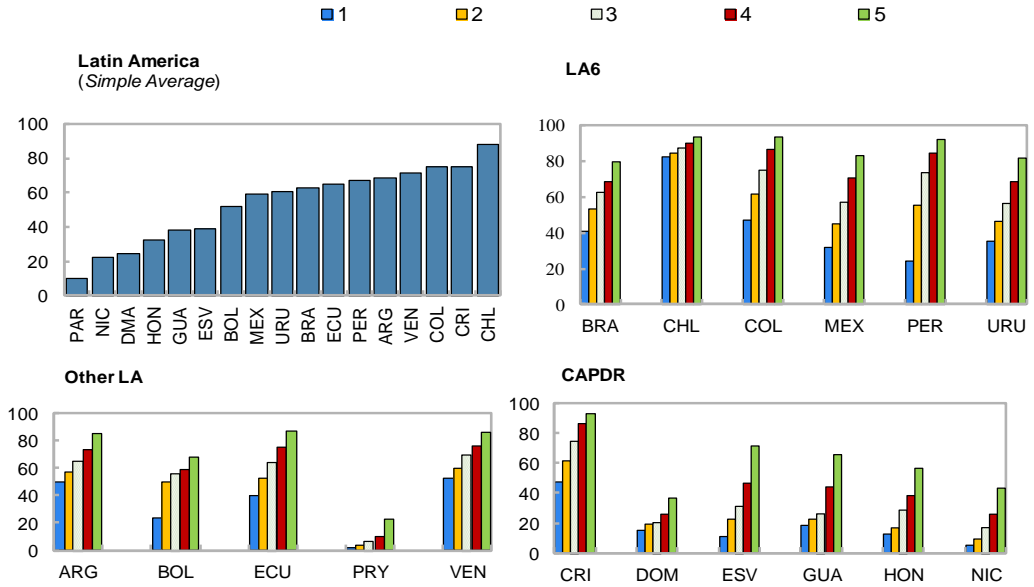
Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations.

Figure 9. Inequality in Health Services and Outcomes, 2005-11
(In percent, unless otherwise stated)

Latin America   Emerging Europe

Births attended by skilled health personnel by wealth quintile
(Mean unless otherwise stated, shaded area shows middle 50 percent of counrties)

Under-five mortality rate situation by place of residence
(Deaths per thousand live births)

Stunting among children aged 5 or younger

Health spending
(% of GDP)

Sources: World Health Organization; and authors' calculations.

III.   WHAT DETERMINES INCOME INEQUALITY IN LATIN AMERICA?

In this section, we investigate what could be behind the decline in income inequality in Latin America using two approaches: simple correlations and panel regression analysis. In the econometric analysis we investigate the importance of higher GDP and domestic policies in explaining the decline in Latin America's income inequality.

A. Simple Correlations

We first investigate how the change in Gini coefficient is correlated with various policy variables changes for our sample of Latin American countries. Our analysis (which does not indicate causation) is based on visual observations for a small representative set of policy variables. The variables are chosen based on data availability; these are also variables that have experienced large changes in recent years and are often discussed by policymakers as important determinants of changes in income inequality. Thus the list of variables chosen is not exhaustive (Figure 10). Our observations suggest:

Figure 10. Latin America: Policy Variables and Income Inequality[1]
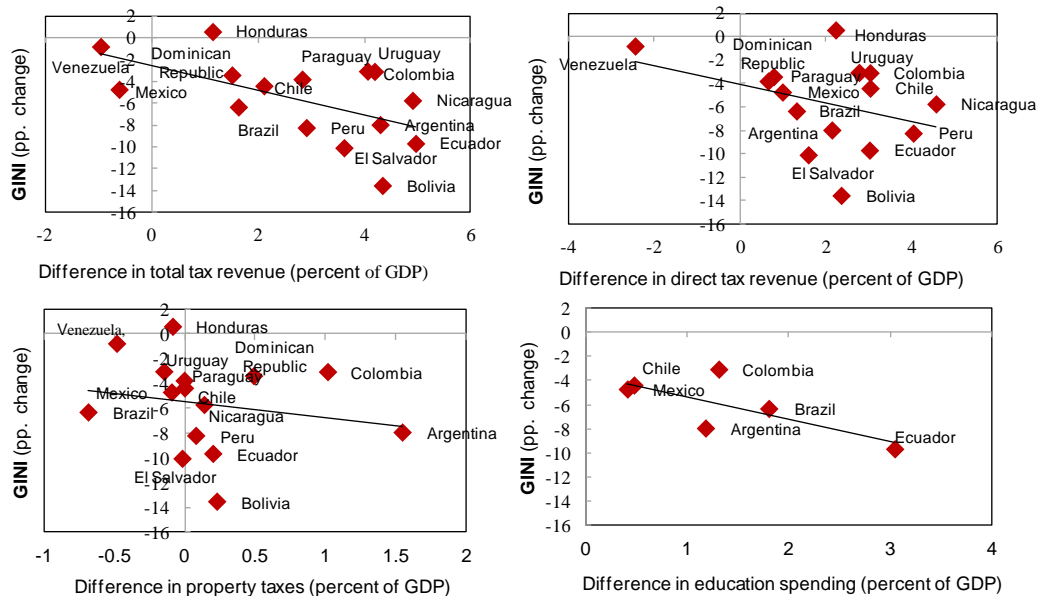
Sources: SEDLAC; and authors' calculations.
*Percentage point change of GINI coefficient and policy variables. Differences reflect change between 2000 and 2011 (or latest available data).

There is a negative correlation between changes in tax revenues (as a share of GDP) and changes in income inequality, implying that increases in tax revenues are associated with decreases in income inequality. An increase in tax revenues, if achieved due to a more progressive tax system, could be associated with lower income inequality directly since progressive taxes are often designed to collect a greater proportion of income from the rich relative to the poor. In addition, an increase in tax revenue could be associated with lower inequality indirectly by allowing the funding of targeted social transfers and public expenditure on education (Cornia, 2012). We also find that increases in direct taxes (such as personal and corporate income tax) and property taxes are negatively correlated with inequality changes. Direct taxes, which are low in LA in cross country comparisons, possibly due to its large informal sector, are typically progressive. Similarly, property taxes which are also extremely low in LA, are also largely levied to richer households who own most of the property (e.g., houses).

Similarly, data suggest a **negative correlation between changes in income inequality and increases in government spending** on education (as a share of GDP); such

spending typically disproportionately benefits the most vulnerable groups and thus is associated with lower inequality.[10]

In the remaining Section we explore econometrically the importance of GDP growth and policies in explaining the decline in LA's income inequality. Our econometric analyses are based on an expanded sample of emerging market economies (with around half of the sample comprising LA countries) to enhance the accuracy of our results given data limitations. Given that our focus is to explain the Gini coefficient changes in LA, we use country (and time) fixed effects.

B. Does the Kuznets Curve Exist?

Using an unbalanced panel econometric analysis for a group of 44 emerging and developing countries for the period 1990–2010 we investigate the existence of the Kuznets curve (see the Appendix for the country list and data description). Formulated by Simon Kuznets in the mid-1950s, the Kuznet's hypothesis postulates that there is an inverted U-shaped relationship between GDP per capita and the Gini coefficient. This implies that economic growth is associated with rising income inequality up to a certain income level (i.e., turning point); once the country reaches that income level, then further economic growth is associated with declining inequality. According to Kuznets, as people move from lower productive agricultural sectors to higher productive industrial sectors, where average income is higher and wages are less uniform, income inequality initially rises. Eventually, however, societies respond to the growing wealth-divide with social-welfare policies that aim to reduce the urban-rural income gap through transfer payments and social benefits.

The Kuznets hypothesis is a rather controversial concept with numerous studies finding conflicting results for its existence. While many studies offer support for the empirical existence of a Kuznets curve, such as Barro (2000, 2008), and Acemoglu and Robinson (2002), others have shown that controlling for country-specific effects can lead to the rejection of the hypothesis (Deininger and Squire, 1998; Higgins and Williamson, 1999; Savvides and Stengos, 2000).[11] However, most of these latter studies have been criticized for the inconsistent income inequality data used.

In this Section, we take a fresh look at this controversial issue. For the estimation, the left- and right-hand-side variables are demeaned using country-specific means (i.e., country fixed effects) in order to focus on within country changes instead of cross-country level

Table 3: Kuznets Specification
(Dependent variable: natural logarithm of Gini)

GDP per capita	0.45
	(0.06)**
Squared GDP per capita	-0.03
	(0.00)**
Observations	910
Countries	44
Time period	1990-2010
Adjusted R-square	0.94
Time and country dummies	√

Sources: Authors' calculations.

Notes: Standard errors are in parentheses; ** denotes significance at the 1 percent level. All explanatory variables are in natural logarithm.

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[10] There is an extensive literature discussing the importance of social spending such as conditional cash transfers in Latin America (e.g., Stampini and Tornarolli, 2012).

[11] See Fields (2001) for a review of the empirical literature.

differences.[12] In addition to country fixed effects, time dummies are included to capture the impact on inequality of common global shocks such as business cycles, external conditions, or growth spurts. Following Stern (2004), we estimate the following model, which as is typically the case, has all variables expressed in their natural logarithm:

$$\text{Ln(Gini}_{it}) = \beta_1 \ln(\text{GDPPC}_{it}) + \beta_2 [\ln(\text{GDPPC}_{it})]^2 + T_t + C_i + \varepsilon_{it}$$

where $Gini_{it}$ stands for the Gini coefficient of country i at time t, *GDPPC* stands for real GDP per capita (PPP), and T_t and C_i are time and country dummies, respectively. The model is estimated using ordinary least squares with heteroskedasticity-consistent standard errors.

Taking into consideration the inherent limitations of the data set and of cross-country regression analysis more generally, our results presented in Table 3 confirm the presence of the Kuznets curve (i.e., $\beta_1 > 0$ and $\beta_2 < 0$ and are statistically significant). Similar to various studies (e.g., Barro (2000)) we find that the Kuznets curve does not explain the bulk of variations in inequality across countries or over time. Our analysis suggests that only one eight of the decline in Latin America's income inequality in the last decade can be associated with the recent strong growth momentum.

C. Policies to the Rescue

In the remaining section, we investigate the importance of macroeconomic policies in explaining the decline in income inequality in Latin America using a panel econometric analysis (with time and fixed effects) for a sample of 38 emerging and developing economies over the period 2001-2010. We consider the following policies given data availability, their importance in policymaker's decision-making and the fact that they have experienced large changes in recent years:

- **Government spending on education**. We expect that rising education spending (as a share of GDP) would be negatively associated with changes in the Gini coefficient, as this spending would be linked to greater access of low-income families to education and thus to lower skill premium (see also IMF(2014a));

- **Tax revenue**. Higher tax revenues would be associated with lower income inequality if tax revenues are largely raised through progressive taxation that imposes a larger share of the tax burden to those with the greatest ability to pay. In addition, higher tax revenues could lower inequality indirectly by allowing the funding of targeted social transfers and public expenditure on education (Cornia, 2012).

- **Foreign Direct Investment.** The association between higher FDI and inequality is less clear; FDI could be associated with lower inequality in countries with abundant supply of unskilled labor in line with the predictions of the Stolper-Samuelson corollary of the Heckscher- Ohlin theorem (Cornia, 2012). However, FDI may be linked to skill-specific

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[12] An additional advantage of focusing on within-country variation is to reduce the risk of omitted variable bias (Jaumotte, Lall, and Papageorgiou, 2008).

technological change and thus higher skill premium (see Willem te Velde (2003) for a discussion of FDI and inequality in Latin America). Thus, the sign of the coefficient is not clear apriori.

- **Exchange rate policies.** Depreciating exchange rates are expected to be associated with lower inequality by shifting production from the comparatively unequal non-tradable sector to the more unskilled labor intensive tradable sector (Cornia, 2012). Thus, we would expect a negative coefficient.

Specifically, we estimate the following equation:[13]

$$\text{Gini}_{it}= \beta_1 \, \text{FDI}_{it} + \beta_2 \, \text{educ} + \beta_3 \, \text{tax}+ \beta_4 \, \text{reer}+ T_t + C_i + \varepsilon_{it}$$

where $Gini_{it}$ stands for the Gini coefficient of country i at time t, *FDI* stands for foreign direct investment (as a share of GDP), educ and tax stand for education spending and tax revenue, (both as a share of GDP), respectively, and reer stands for real effective exchange rate. T_t and C_i are time and country dummies, respectively. The country dummies capture the different institutional characteristics of our sample countries; we also tried to explicitly include institutional variables in our specification, but their effect was largely insignificant in explaining changes in the Gini coefficient.

While we should be cognizant of the inherent limitations of the data set and of cross-country regression analysis more generally (including the fact that we don't model causality), we find that education spending, taxation and depreciating exchange rates are associated with lower inequality (as expected). Our results suggest that FDI is also associated with lower inequality, highlighting the importance of strong economic fundamentals to boost FDI and subsequently equality (Table 4). Based on the estimated model, the contributions of the various factors to the change in the Gini coefficient can be calculated as the average total change in the respective variable over the last decade multiplied by the corresponding coefficient estimate (in the spirit of Jaumotte, Lall and Papageorgiou, 2008).

Table 4: Income Inequality Panel Regression
(*Dependent variable: Gini coefficient*)

|	
Real effective exchange rate	0.02
	(0.06)**
Tax revenue (in percent of GDP)	-0.08
	(-0.04)**
Education spending (in percent of GDP)	-0.72
	(-0.23)**
FDI (in percent of GDP)	-0.12
	(0.06)**
Observations	274
Countries	38
Time period	2001-10
Adjusted R-square	0.98
Time and country dummies	√

Source: Authors' calculations.
Notes: Standard errors are in parentheses;
** denotes significance at the 1 percent level.

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[13] We use levels and not logarithms since it would be easier to interpret the estimated coefficients; for example, the Gini elasticity with respect to the tax revenue as a share of GDP is not obvious to interpret.

We find that the four policies considered explain more than half of the recent decline in income inequality in Latin America, with higher education spending explaining almost a fourth of the overall decline alone (i.e., 0.8 out of the 3 Gini points). Higher FDI and higher tax revenue jointly also explain more than a forth of the total decline in the Gini coefficient over the last decade. Exchange rate policies have been associated with higher inequality in the region, given that currencies have appreciated on average in LA over the last decade. (Figure 11). Common external factors, proxied by time dummies in our specification, explain the remaining change in LA's Gini coefficient over the last decade.

Figure 11. Latin America: Decline in Gini Coefficient Explained by Policies and GDP Growth
(*Gini points*)
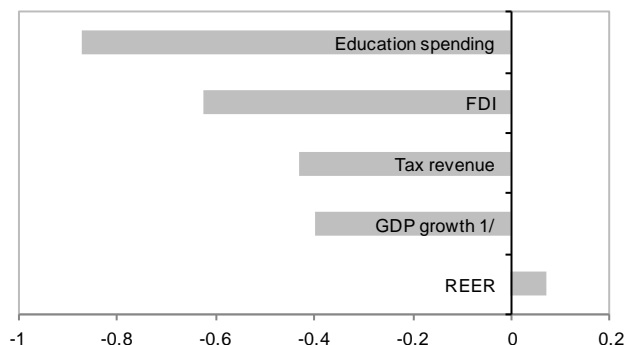
Source: Authors' calculations.
1/ Based on the Kuznet's specification.

Our results should be viewed with caution given the inherent limitations involved in data and cross-country regressions in general. Specifically, our list of policies considered is not exhaustive (for example, we exclude important inequality determinants such as the level/effectiveness of social/cash transfers, health spending, quality/types of education, infrastructure spending and access to basic services). Such variables, which are not included due to data limitations, could be important. For example, transfers would be very important in countries with conditional cash transfers (such as Mexico and Brazil). In addition, our econometric analysis solely looks at the interaction of explanatory variables with the aggregate income Gini coefficient; future work could also look at other dependent variables such as disaggregated sources of income as in, Trujillo and Villafañe (2011) and Garcia-Peñalosa and Orgiazzi (2013), the 90/10 income ratio, the wage dispersion, or the labor income share. We also interpret the time dummies as common external factors which is a rather crude measure of modeling other non-policy factors. Last but not least, our regression analysis does not necessarily imply causality.

IV. CONCLUSIONS AND POLICY IMPLICATIONS

Despite the recent improvement in social indicators, Latin America remains the most unequal region in the world. We explore the reasons behind LA's decline in income inequality using a panel regression analysis. Notwithstanding the limitations involved, we find that well-designed policies can explain more than half of the decline in income inequality (averaging around 3 Gini points over the last decade) with education spending explaining almost one Gini point of the decline. Stronger FDI and tax revenues were also found to be important, while the impact of strong growth dynamics was less pivotal, in the spirit of the Kuznet's hypothesis.

As also noted in Ostry, Berg, and Tsangarides (2014), we should of course be cautious about drawing definitive policy implications from cross-country regression analysis, as different sorts of policies are likely to have different effects in different countries at different times, and causality is difficult to establish with full confidence. But, despite these limitations, our macroeconomic analysis allows us to make some granular assertions of the overall effects . In particular, our analysis suggests the following:

- Improving the access of low-income families to education could be an efficient tool for boosting equality of opportunity, and over the long run, lower income inequality (see IMF (2014a) for more details). It is beyond the scope of this paper to analyze the optimal level of education spending, and which type of education (primary, secondary or tertiary) is the more effective and has the most immediate impact in lowering inequality. One thing is certain, strengthening access to quality education would be pivotal, as Latin America already has relatively high educational spending but rather poor outcomes.

- Stronger FDI could also be important in lowering inequality. While part of FDI is driven by external factors, a lot depends on a country's strong economic fundamentals to attract such flows.

- Last but not least, raising tax revenue (which is rather low in Latin America in cross country comparisons) could be associated with declining inequality. For example, tax revenue (as a share of GDP) was 20 percent in LA versus 34 percent in OECD countries in 2012. While the paper does not describe the channel behind this relationship, it could possibly be related to providing more space to finance well-targeted redistributive policies (see IMF (2014a). The composition of raising tax revenue could also be important on inequality. Taxes on income and profit which account for just one-fourth of total tax revenue in LA compared to 35 percent in OECD countries could potentially have a direct redistributive impact (OECD, 2014). Thus, as suggested in IMF (2014a), countries could consider making their income tax systems more progressive, such as by having more tax progression at the top, taking into account the rising risk from tax evasion. With informality a major problem in Latin America, both fairness and equity could be enhanced by bringing more informal operators into the personal income tax. There is also scope to more fully utilize property taxes; only Colombia and Uruguay collect more than 1 percent of GDP through recurrent property taxes.

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Annex

Figure A1. LA6 - Distribution of Per Capita Household Income by Highest and Lowest Decile
(percent of total)

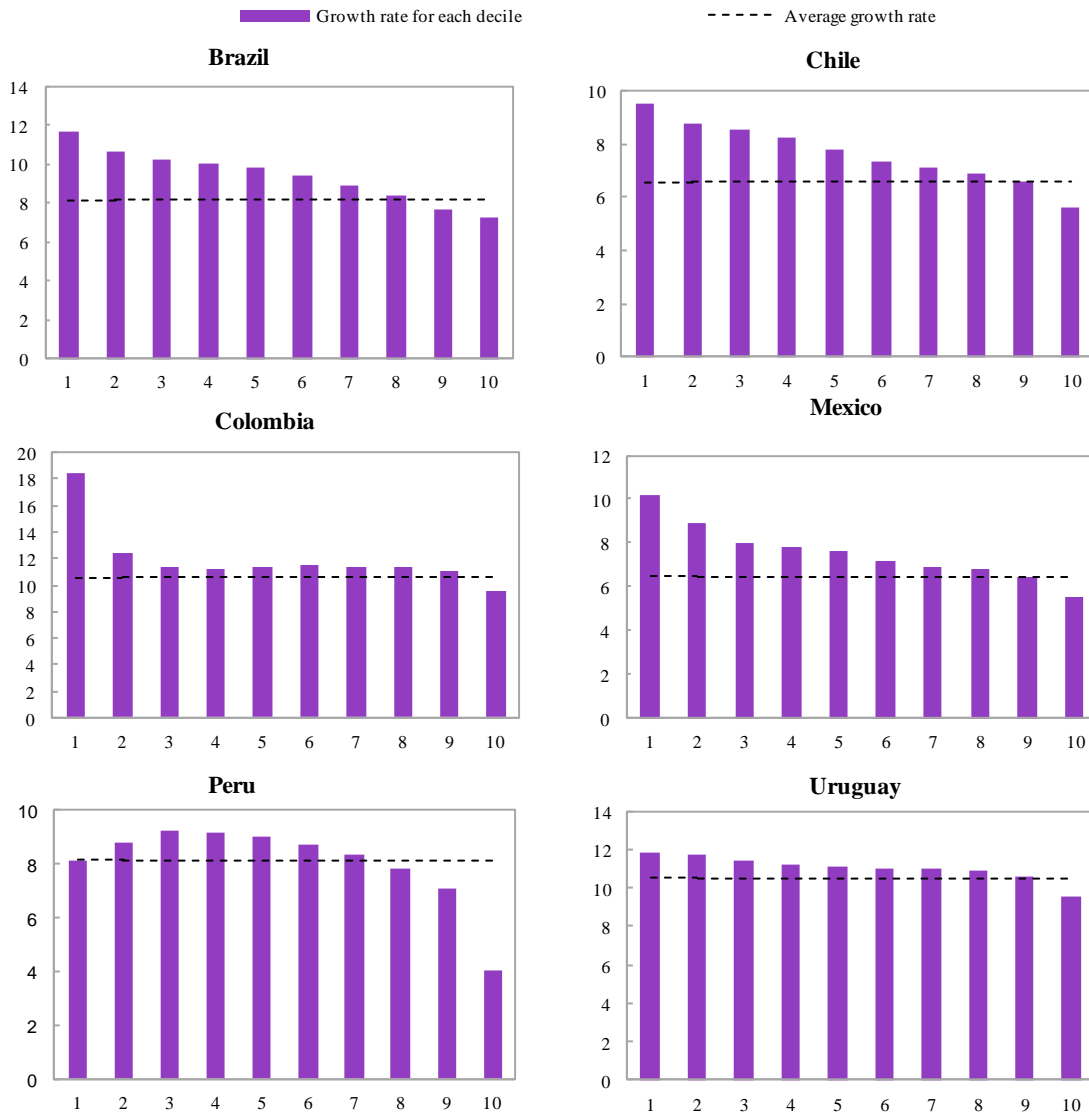———— Highest decile   ———— Lowest decile (right scale)
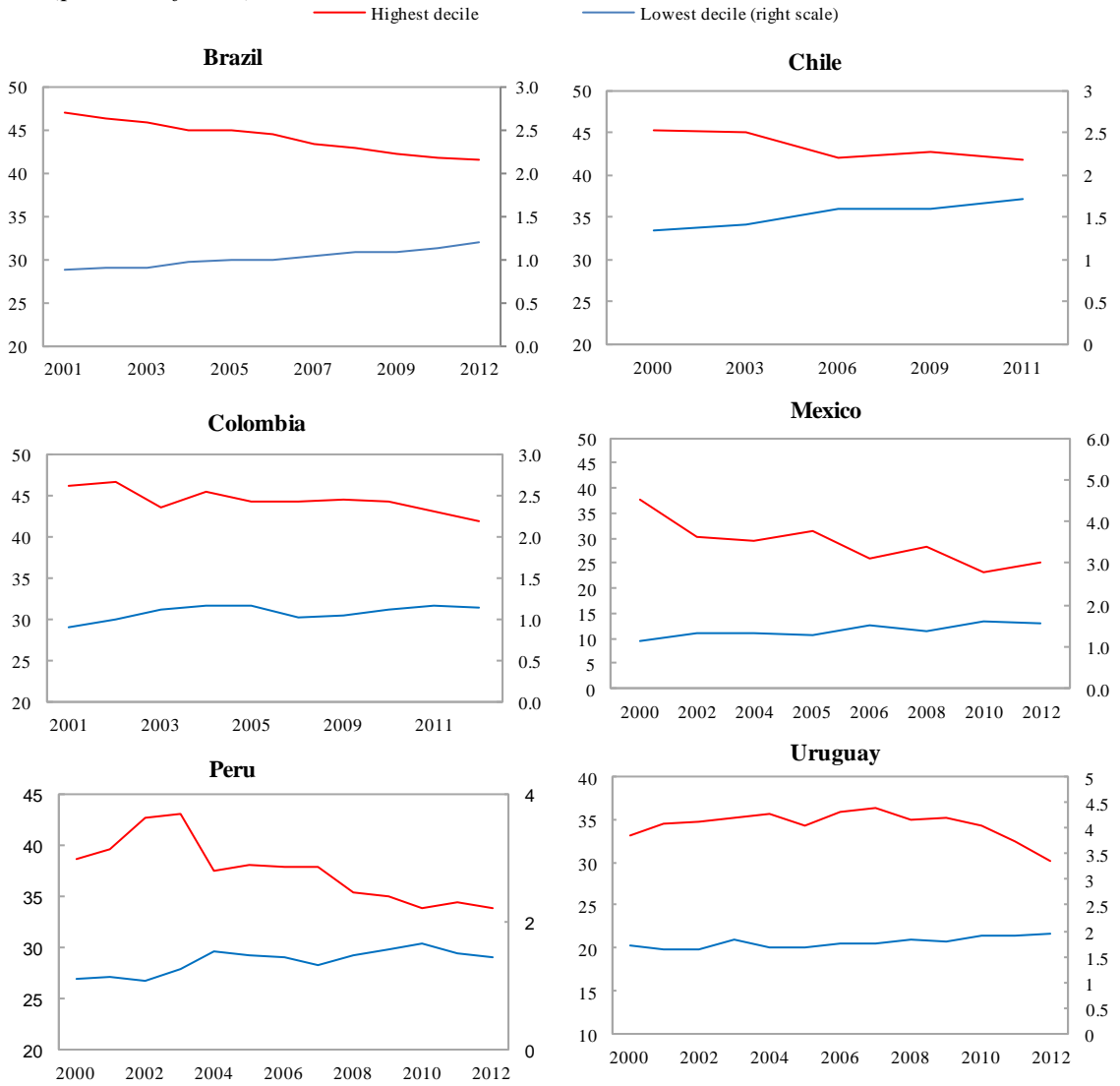
Sources: Centro de Estudios Distributivos Laborales y Sociales (CEDLAS); Socio-Economic Database for Latin America and the Caribbean (SEDLAC); The World Bank; and authors' calculations.

Figure A2. OTHER LA- Distribution of Per Capita Household Income by Highest and Lowest Decile

(percent of total)

Highest decile ——— Lowest decile (right scale)
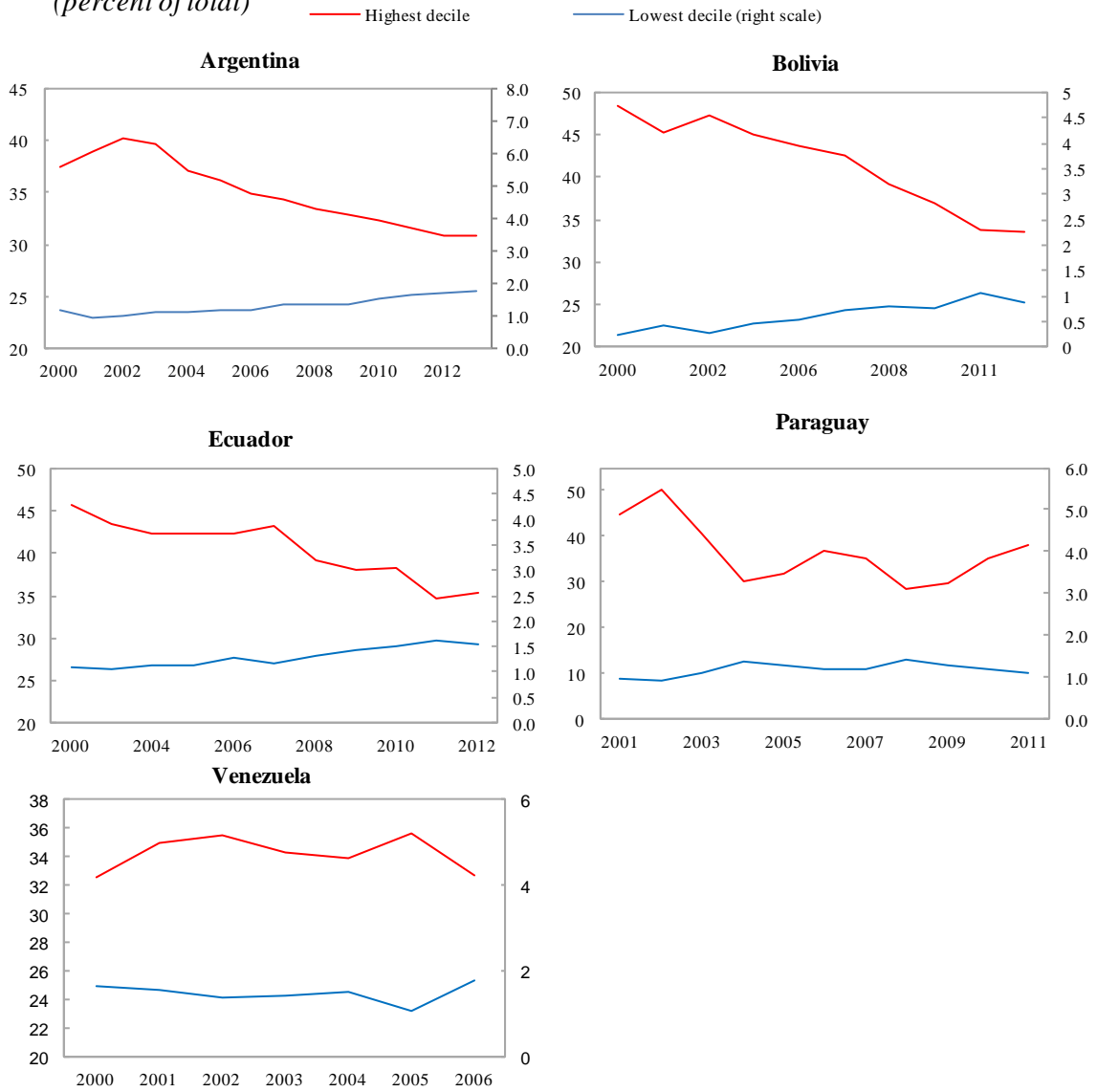
Sources: Centro de Estudios Distributivos Laborales y Sociales (CEDLAS); Socio-Economic Database for Latin America and the Caribbean (SEDLAC); The World Bank; and authors' calculations.

Figure A3. CAPDR - Distribution of Per Capita Household Income by Highest and Lowest Decile
(percent of total)
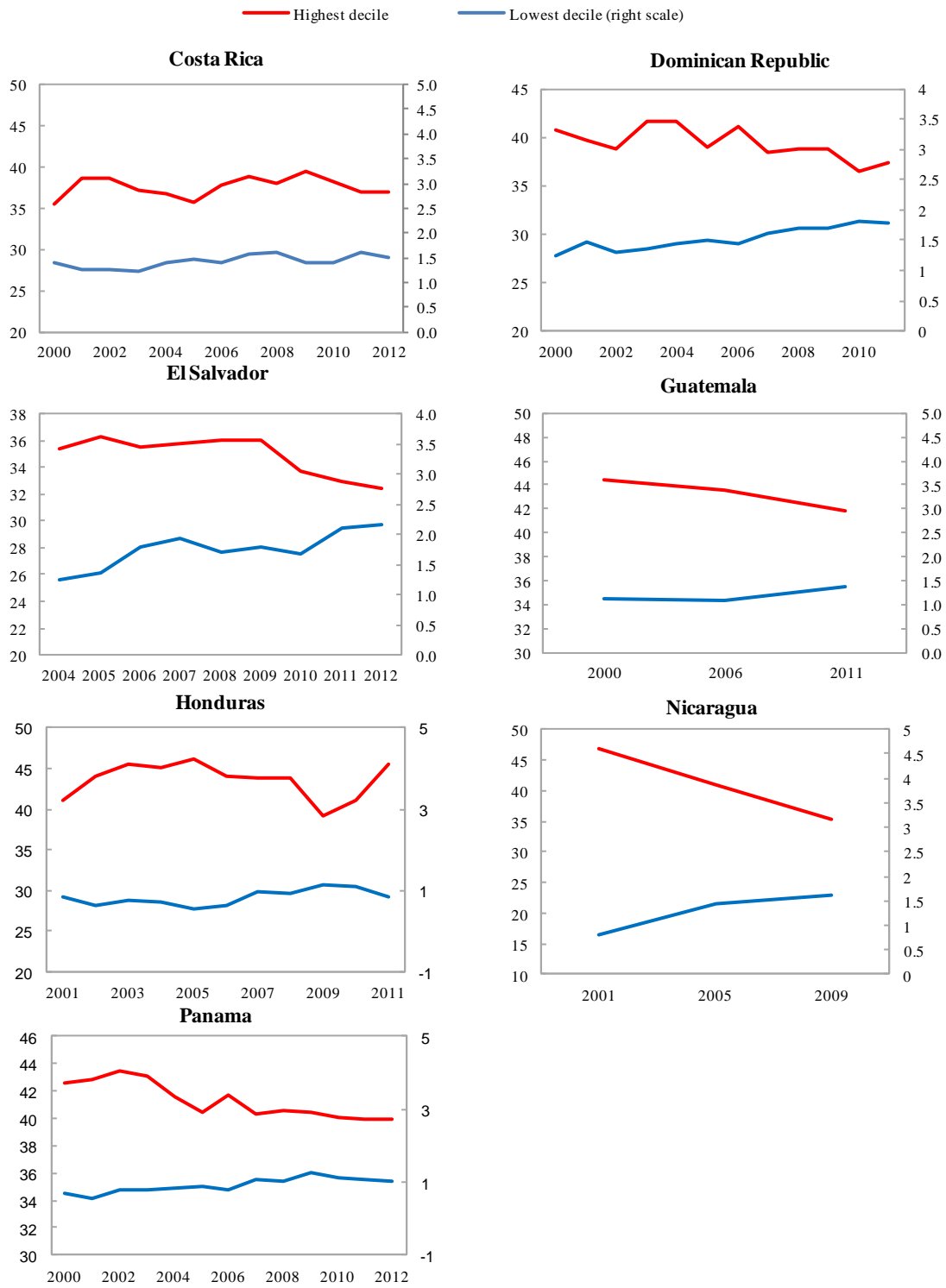
Sources: Centro de Estudios Distributivos Laborales y Sociales (CEDLAS); Socio-Economic Database for Latin America and the Caribbean (SEDLAC); The World Bank; and authors' calculations.

Figure A4. LA6 Growth Incidence Curves During the Last Decade[1]
(Rate of annual growth of household per capita income, in percent)

Growth rate for each decile - - - - - Average growth rate

Brazil

Chile

Colombia

Mexico

Peru

Uruguay

Sources: Centro de Estudios Distributivos Laborales y Sociales (CEDLAS); Socio-Economic Database for Latin America and the Caribbean (SEDLAC); The World Bank; and authors' calculations.
[1] Growth incidence curves of household per capita income for Brazil, Chile, Colombia, Mexico, Peru and Uruguay (deciles). The changes are 2004-12 in Brazil, 2000-11 in Chile, 2001-12 in Colombia, 2000-12 in Mexico, 2003-12 in Peru, and 2000-12 in Uruguay.

Figure A5. Other LA - Growth Incidence Curves During the Last Decade[1]LAST DECADE[1]

(Rate of annual growth of household per capita income, in percent)
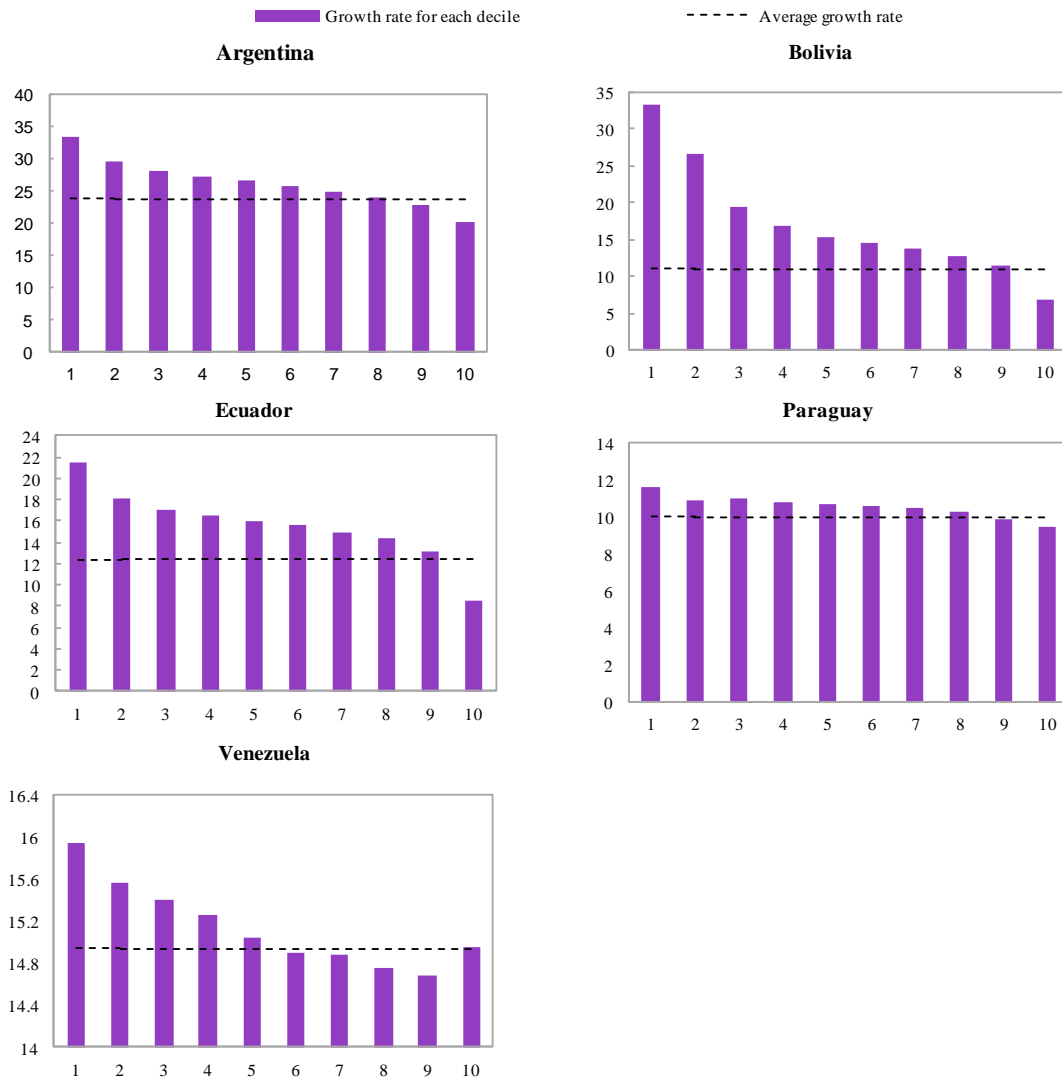
■ Growth rate for each decile   - - - - - Average growth rate


Argentina

Bolivia

Ecuador

Paraguay

Venezuela

Sources: Centro de Estudios Distributivos Laborales y Sociales (CEDLAS); Socio-Economic Database for Latin America and the Caribbean (SEDLAC); The World Bank; and authors' calculations.
[1] Growth incidence curves of household per capita income for Argentina, Bolivia, Ecuador, Paraguay, and Venezuela (deciles). The changes are 2003-13 in Argentina, 2000-12 Boliva, 2003-12 Ecuador, 2001-11 Paraguay, and 2000-06 Venezuela.

Figure A6. CAPDR - Growth Incidence Curves During the Last Decade[1]
(Rate of annual growth, percent)
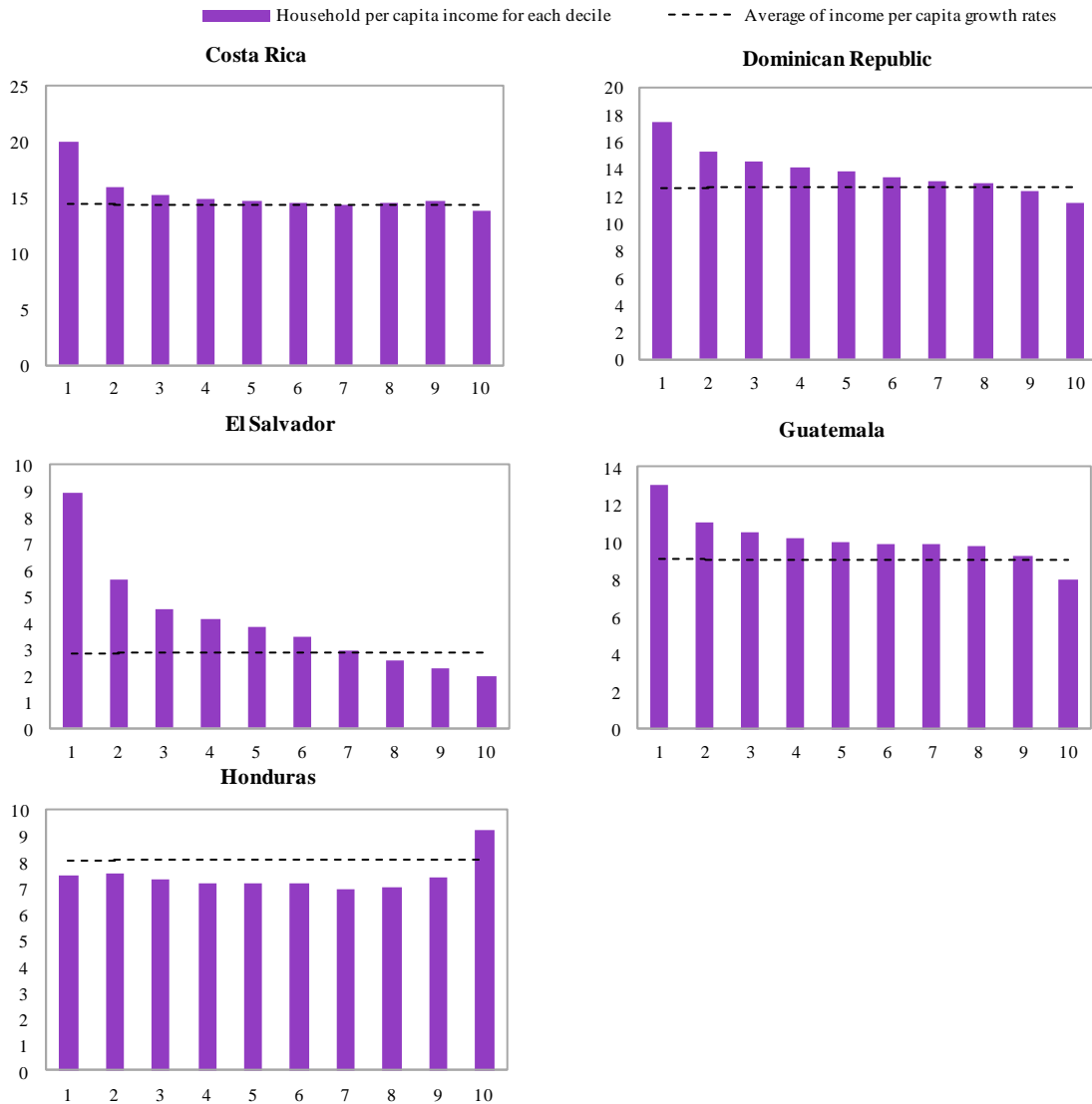
■ Household per capita income for each decile   - - - - - Average of income per capita growth rates

Costa Rica

Dominican Republic

El Salvador

Guatemala

Honduras

Sources: Centro de Estudios Distributivos Laborales y Sociales (CEDLAS); Socio-Economic Database for Latin America and the Caribbean (SEDLAC); The World Bank; and authors' calculations.
[1] Growth incidence curves of household per capita income for Costa Rica, Dominican Republic, El Salvador, Guatemala, and Honduras. Data for Nicaragua and Panama were not available. The changes are 2001-12 in Costa Rica, 2000-11 in Dominican Republic, 2004-12 in El Salvador, 2000-11 in Guatemala, and 2001-11 in Honduras.

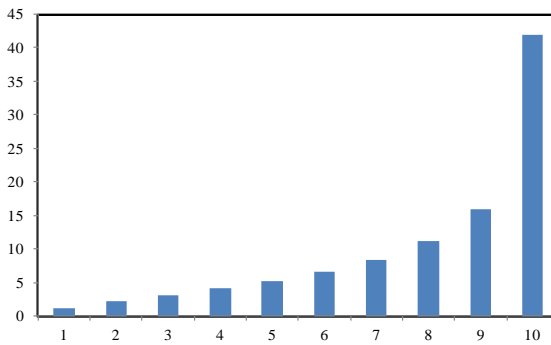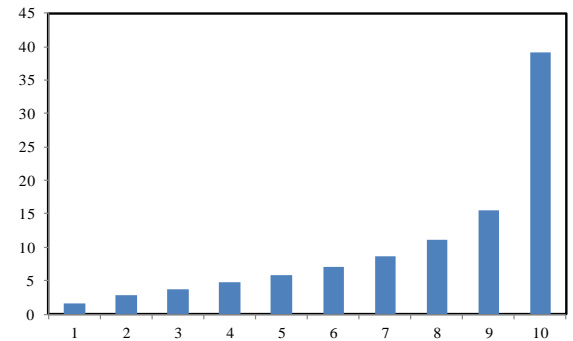**Figure A7. LA6: Distribution of Per Capita Household Income**
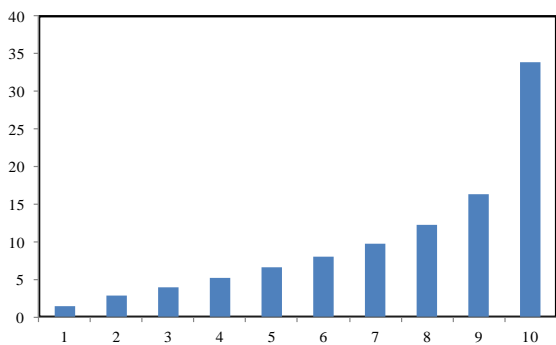*(by decile)*
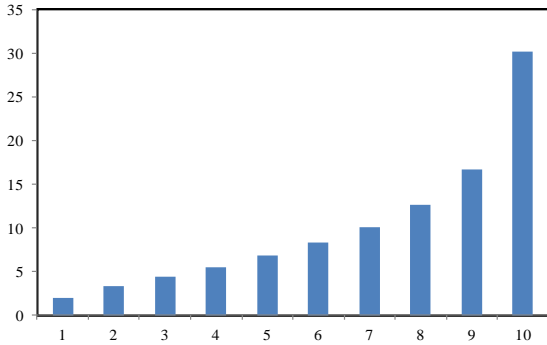
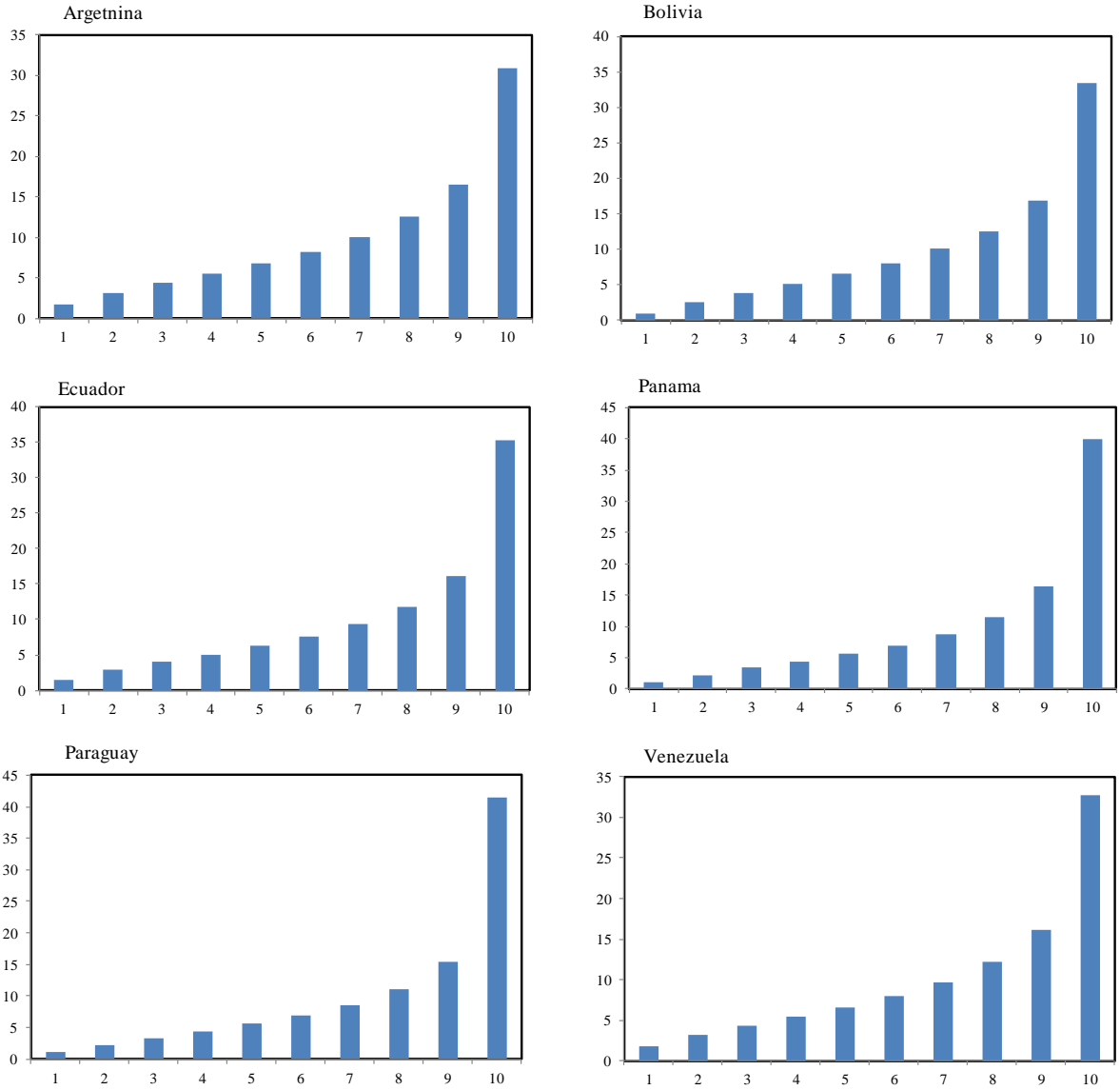Brazil
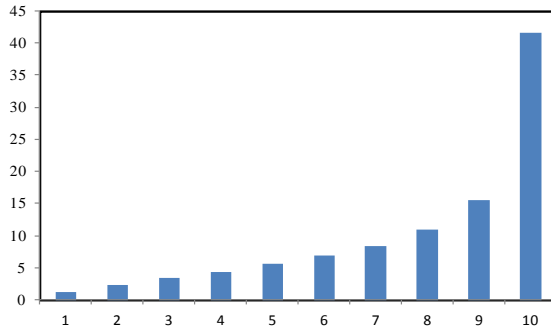
Chile
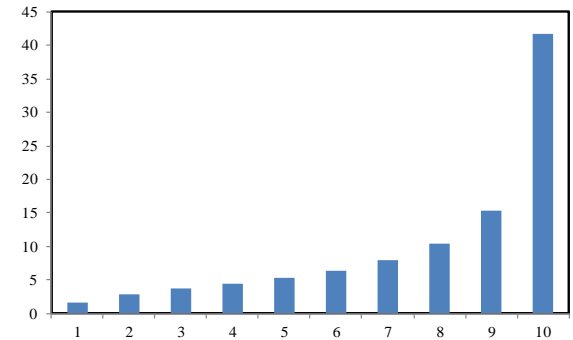
Colombia

Mexico

Peru

Uruguay

Sources: Socio-Economic Database for Latin America and the Caribbean; and authors'
calculations

Figure A8. OTHER LA: Distribution of Per Capita Household Income
(by decile)

Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations

Figure A9. CAPDR: Distribution of per capita household income
(by decile)
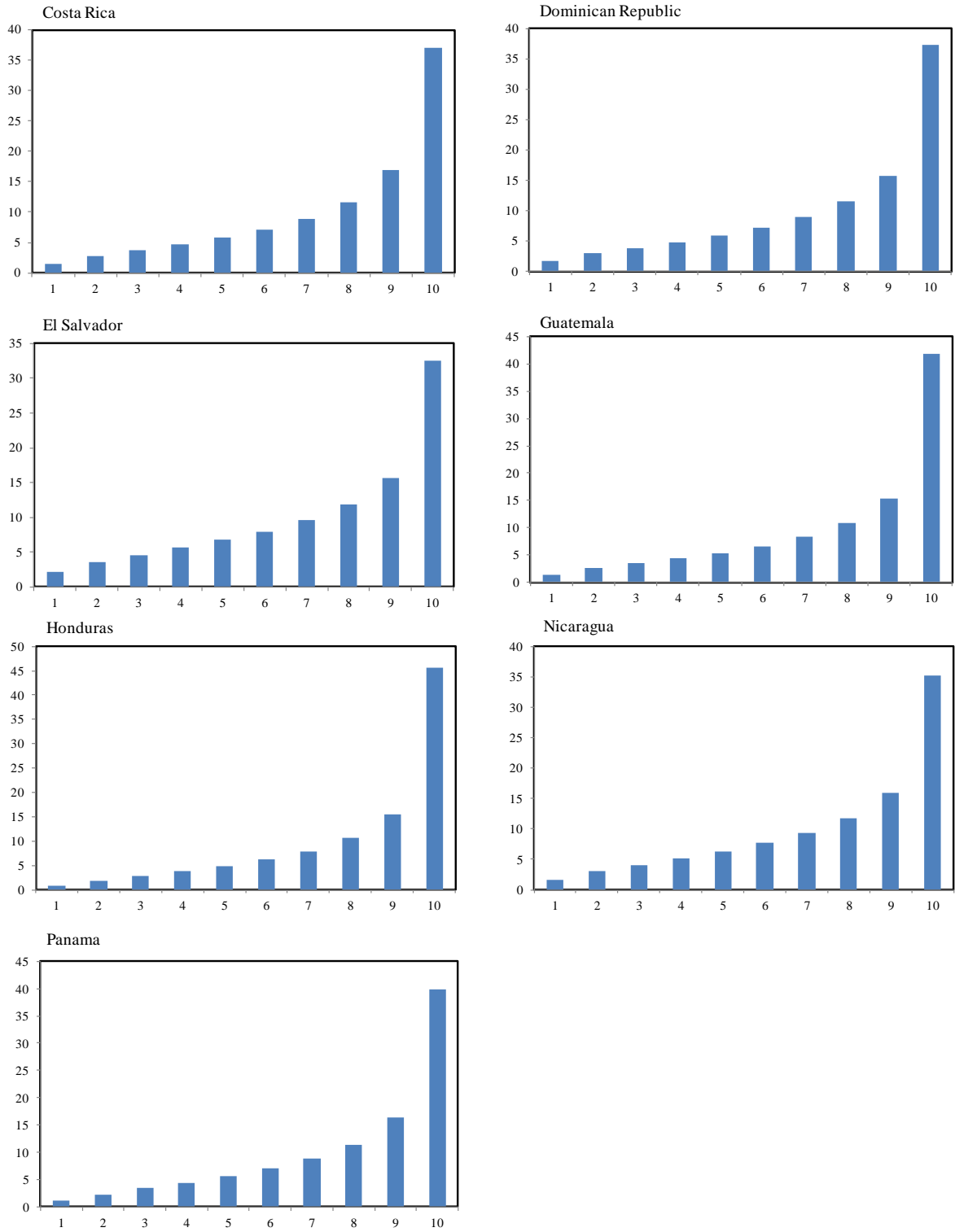
Costa Rica

Dominican Republic

El Salvador

Guatemala

Honduras

Nicaragua

Panama

Sources: Socio-Economic Database for Latin America and the Caribbean; and authors' calculations.

APPENDIX: DATA SOURCES AND SAMPLE COUNTRIES

This appendix provides details on the data sources used in this analysis and lists the countries used in the econometric analysis.

Data Sources: The source for the Gini index data used in the econometric analysis is the World Bank's *Povcal* database, while data on tax revenue and education spending are from *World Development Indicators*. The real effective exchange rate was extracted from *IMF's Information Notice System*, and data on real GDP per capita (PPP) and FDI are from *IMF's World Economic Outlook*.

Sample of countries for Kuznets analysis: Argentina, Bangladesh, Belarus, Bolivia, Brazil, Bulgaria, Chile, China, P.R., Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ghana, Guatemala, Honduras, Hungary, Indonesia, Jamaica, Kazakhstan, Latvia, Lithuania, Malaysia, Mexico, Nicaragua, Nigeria, Panama, Paraguay, Peru, Philippines, Poland, Romania, South Africa, Sri Lanka, Thailand, Trinidad and Tobago, Turkey, Uganda, Ukraine, Uruguay, Venezuela, and Vietnam.

Sample of countries for regression analysis on policies: Argentina, Bangladesh, Belarus, Bolivia, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ghana, Guatemala, Hungary, Indonesia, Jamaica, Kazakhstan, Latvia, Lithuania, Malaysia, Mexico, Nicaragua, Panama, Paraguay, Peru, Philippines, Poland, Romania, South Africa, Sri Lanka, Thailand, Turkey, Uganda, Ukraine, and Vietnam.