Overcoming the "empty box syndrome". Determinants of income distribution in Latin America

Ivonne González and Ricardo Martner

ABSTRACT

Latin America's persistent inequality seem to reflect the lack of specific policies to reduce income disparities. The present study uses econometric techniques to estimate the determinants of the income distribution in the region, in a context in which economic growth seems to coexist with the reduction of inequalities — thereby overcoming the "empty box syndrome" that characterized the region in the 1980s and 1990s. Using cross-section studies of a sample of member countries of the Organization for Economic Cooperation and Development (OECD) and Latin America, along with panel estimations for 18 Latin American countries in the period 1990-2010, the article reveals the key role played by educational, institutional and macroeconomic variables in the recent improvements. It also identifies the importance of fiscal action, through variables such as social spending, expenditure on education, capital expenditure and an indicator of the progressiveness of the tax system.

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I

Introduction

Latin America continues to be the most unequal region of the world, although most of its countries are middle-income economies and continue to enjoy relatively sustained economic growth. Projections by the International Monetary Fund (IMF, 2012) show that several Latin American countries will have a per capita income of around US$ 20,000 measured in purchasing power parity (PPP) terms, which is the threshold for classification as a developed country. This status poses even greater income-distribution challenges.

The region's inequality is illustrated by the usual income-distribution indicator, the Gini coefficient. Discussion on this distribution differs from discussion on growth, despite well-known dichotomies and complementarities (ECLAC, 1990). For example, while Burundi has a nominal per capita gross domestic product (GDP) of just US$ 192, its Gini coefficient is 0.33 — indicating a better income distribution than one of Latin America's least unequal countries, Uruguay, which in 2010 had a Gini coefficient of 0.42 but a nominal per capita GDP of US$ 12,000.

In the region, growth combined with a highly unequal income distribution (as in several Latin American countries) coexists with situations of stagnation or poverty combined with either a good or a bad income distribution; but fortunately growth can also go hand in hand with equality.[1] The "empty box syndrome" (Fajnzylber, 1990) shows that Latin American countries did not achieve simultaneous growth and equity goals in the 1980s, nor (more ominously) in the 1990s. Since the publication of the key article that provides the title for this paper, the region's income distribution has not improved much, as the average Gini coefficient fell by just five points from 0.55 in 1990 to 0.50 in 2010. The persistence of inequality seems to reflect the absence of specific policies to reduce income disparities, compounded by predominantly volatile income and employment levels.

The relation between the level of national income and its distribution can be interpreted in two directions: become more equal to grow, or grow to become more equal; and it also displays dichotomies and complementary features (ECLAC 2010). While many studies have tried to estimate how the income distribution affects economic growth, in most cases the results have been somewhat vague. Barro (2000) uses panel regressions for a broad sample of 100 countries to estimate the per capita GDP growth rate, using explanatory variables that include the rate of investment, the fertility rate, years of schooling, and the terms of trade. An additional explanatory variable is the Gini coefficient, which proves to be non-significant for the sample as a whole, but positive for the lower-income countries and negative for wealthier ones. The author uses this finding to infer the existence of a Kuznets curve in which "…inequality first increases and later decreases during the process of economic development."

Since the Barro study, the general evidence has confirmed that this relation is not statistically robust (López and Servén, 2005), so apparently there is no verifiable linear relation between the income distribution and economic growth in cross-section estimations. Nor do there seem to be any studies that analyse this issue exclusively for a sample of Latin American countries.

On the other side of the coin, while discussion of the causes of the unequal income distribution have been intense and polemical, there are few studies (if any focusing specifically on Latin America) that seek to quantify the explanatory factors involved. Martorano and Cornia (2011) and Cornia (2012) have compiled variables related to the income distribution for the region in a publicly accessible database; while Lustig, López-Calva and Ortiz-Juárez (2011) have produced a wide range of research studies analysing selected cases and identifying a variety of causes for the recent improvement in inequality indices, such as educational progress and larger government transfers to the poorest families. ECLAC (2011) also analyses changes in inequality with a labour and non-labour income breakdown.

In a recent econometric estimation for OECD countries, Afonso, Schuknecht and Tanzi (2008) find that government policies have positive effects on the income distribution, both directly through social spending and indirectly through the quality of education and institutions.

The present article aims to replicate these methodologies for Latin American countries, performing

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☐ This article is an update of González and Martner (2010).

[1] In OECD countries, this combination prevailed in particular between 1950 and 1980, when the Gini coefficient dropped from over 0.40 to 0.30, against a backdrop of economic growth (Afonso, Schuknecht and Tanzi, 2008).

econometric estimations to analyse the repercussions of public expenditure and the composition of taxes, among other variables, on the income distribution. This approach is simpler than the usual procedure, in which Gini coefficients are compared before and after taxes and public expenditure (for a compilation see Gómez Sabaini and Martner, 2008); and the aim is to directly estimate the effects of fiscal action on the income distribution for a broad sample of Latin American countries. This may help consolidate the literature that stresses the primacy of fiscal action in variations in the Gini coefficient.

The rest of this article is organized as follows: section II describes recent trends in the income distribution and economic growth; section III reviews a number of older and more recent ECLAC studies on proposals for overcoming the "empty box syndrome" and presents the estimates; and lastly section IV offers concluding remarks.

II
The "empty box syndrome"

Growth in the region over the last few decades has been highly volatile, with four clearly defined phases starting in 1990 (see figure 1): an upswing until 1997, followed by an acute crisis between 1998 and 2002; a third phase of strong recovery between 2003 and 2008, and a fourth phase, starting in late 2008, of slump and recovery in the wake of the international financial crisis.

Without denying the importance of more structural factors, these clearly defined cycles have undoubtedly had a major effect on variations in the indices that measure the income distribution. Table 1 shows that the Gini coefficient has responded to these fluctuations in several countries. Accordingly, the 1990s could be described as a period of "exclusive growth (see figure 2), because, except for Uruguay, Colombia and Honduras, the average Gini coefficient remained constant, despite annual per capita GDP growth of around 2%. As would be expected, the 1998-2002 crisis tended to make that coefficient deteriorate, particularly in Argentina and Costa Rica.

FIGURE 1
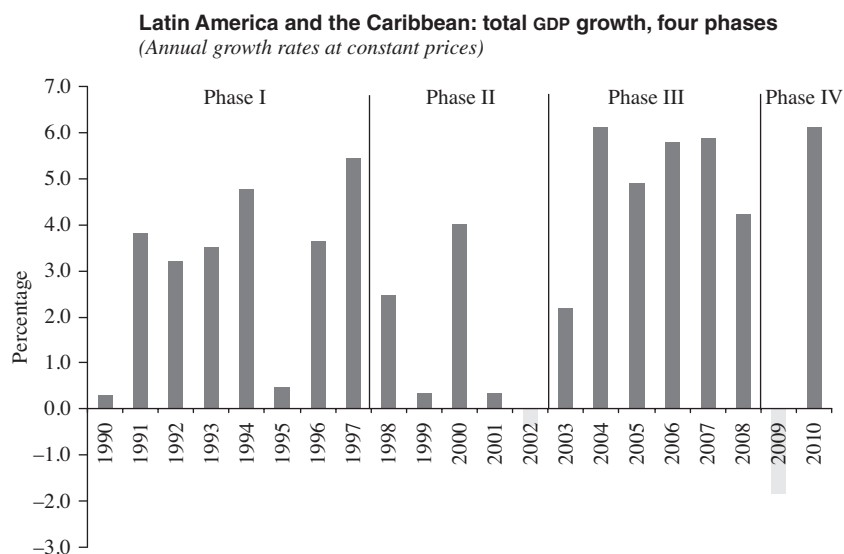
Latin America and the Caribbean: total GDP growth, four phases
(Annual growth rates at constant prices)

Source: prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC).
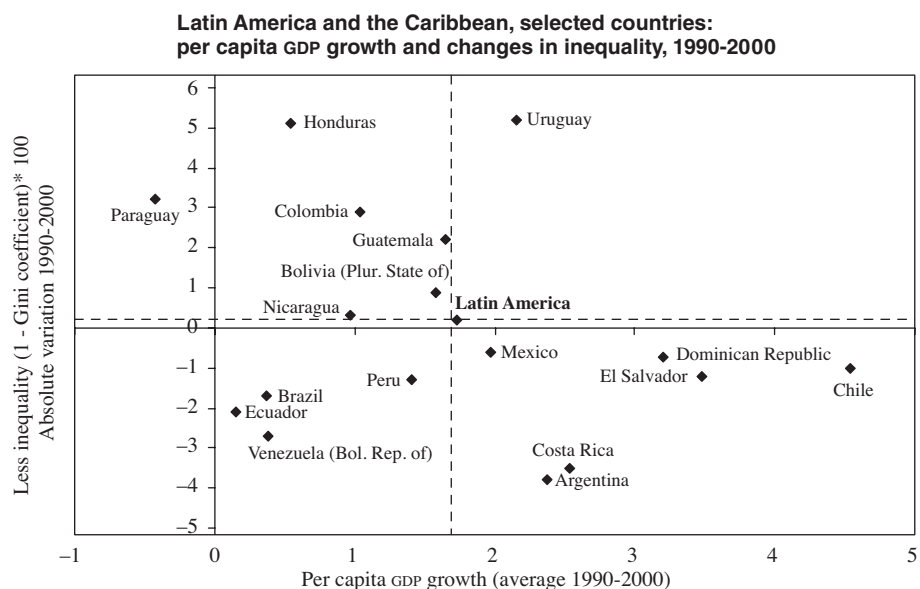
GDP: Gross domestic product.

TABLE 1

Latin American and Caribbean, selected countries: Gini coefficient
(Values between 0 and 1)

Country/period	1985-1990	1990-1997	1998-2002	2003-2008	2009	2010
Argentina	0.50	0.52	0.55	0.53	0.51	0.51
Bolivia (Plurinational State of)	0.59	0.60	0.60	0.57	-	-
Brazil	0.63	0.62	0.64	0.61	0.58	-
Chile	0.56	0.55	0.56	0.54	0.52	-
Colombia	0.59	0.57	0.58	0.57	0.58	0.58
Costa Rica	0.45	0.45	0.48	0.48	0.50	0.49
Ecuador	0.50	0.52	0.53	0.52	0.50	0.50
El Salvador	0.50	0.51	0.52	0.49	0.48	0.45
Guatemala	0.59	0.57	0.55	0.57	-	-
Honduras	0.62	0.58	0.57	0.59	0.57	0.57
Mexico	0.54	0.53	0.53	0.52	0.48	0.48
Nicaragua	0.57	0.58	0.58	0.54	-	-
Panama	0.52	0.57	0.55	0.54	0.52	0.52
Paraguay	0.59	0.58	0.56	0.54	0.51	0.53
Peru	0.49	0.53	0.54	0.50	0.47	0.46
Dominican Republic	0.50	0.52	0.53	0.56	0.57	0.55
Uruguay	0.50	0.45	0.45	0.45	0.43	0.42
Venezuela (Bolivarian Republic of)	0.50	0.49	0.50	0.45	0.42	0.39
Latin America (simple average)	*0.54*	*0.55*	*0.55*	*0.53*	*0.51*	*0.50*

Source: Prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC).

FIGURE 2

**Latin America and the Caribbean, selected countries:
per capita GDP growth and changes in inequality, 1990-2000**

Source: prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC).
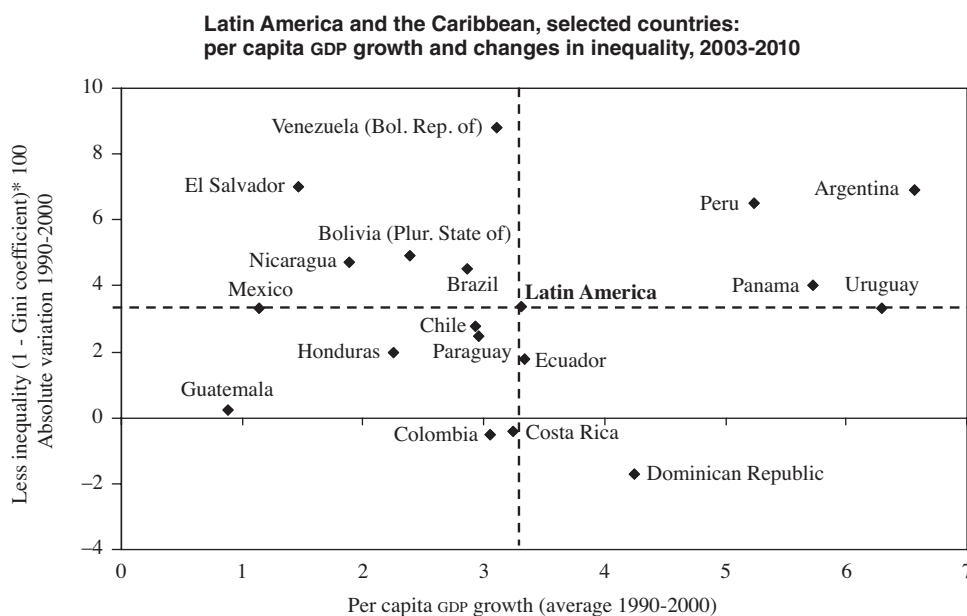
GDP: Gross domestic product.

In contrast, the first decade of the new millennium can in hindsight be described as a period of "inclusive growth", since the vast majority of Latin American countries enjoyed positive growth and substantial improvements in their Gini coefficients, which fell by an average of four percentage points (figure 3). Although the evidence is very recent, it is worth mentioning the coexistence of growth with rising degrees of equality, as seen in Argentina, Panama, Peru and Uruguay, which grew at above-average rates while also achieving better-than- improvements in their Gini coefficients.

The Bolivarian Republic of Venezuela, Brazil, El Salvador, Mexico, Nicaragua and the Plurinational State of Bolivia all recorded significant progress in terms of the income-distribution measure, although their economies grew more slowly than the regional average. Other countries, such as the Dominican Republic and Ecuador, enjoyed vigorous growth, but with below-average distributional improvements. Lastly, Chile, Colombia, Guatemala, Honduras and Paraguay under-performed the average both in growth and in the absolute variation of the Gini coefficient. Of course, these measures are static and only reflect the signs of a changing economic and social dynamic. What is clear, however, is that the region has staged a rapid recovery from the effects of the financial crisis, but with results in terms of income distribution that vary widely across countries.

FIGURE 3

**Latin America and the Caribbean, selected countries:
per capita GDP growth and changes in inequality, 2003-2010**

Source: prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC).

GDP: Gross domestic product.

This diversity can possibly be explained by the region's productive heterogeneity. Cornia (2012) divides the region's countries into three groups: (i) "industrial economies" (Argentina, Brazil, Mexico, Uruguay); (ii) "commodity exporters" (Plurinational State of Bolivia, Chile, Colombia, Costa Rica, Ecuador, Peru and the Bolivarian Republic of Venezuela); and (iii) "remittance receivers" (Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, Panama and Paraguay). Although this classification is somewhat

artificial and misleading, it has the merit of revealing significant differences in the trend: the "industrial economies" and the "commodity exporters" saw their Gini coefficients fall relatively more than the "remittance receivers" (by 4 and 2 points of the Gini coefficient, respectively, see figure 4).

Although there are likely to be other country-specific situations that explain the progress made (see box 1 for the case of Brazil), it is clearly worth performing statistical inference studies to identify common causes.

BOX 1

Income distribution in Brazil

Having remained stable around 0.60 for several decades until 2000, the Gini coefficient then trended downwards by 0.7 points per year, to reach a level of 0.54 in 2008. The available evidence shows that roughly half of this reduction reflected improvements in the social protection system — particularly the contributions made by the *Bolsa Família* family subsidy programme (PBF) and other social assistance mechanisms. The PBF has substantially increased its number of beneficiaries and today serves 11 million families, or nearly 50 million individuals.

The second fundamental policy for reducing inequalities involved raising the minimum wage, which has grown continuously since 1995. A policy of minimum-wage hikes projected to 2023 has been in force since 2007, mandating adjustments based on inflation and GDP growth over the two previous years. The minimum wage indexes two thirds of social security benefits, both urban and rural. In addition to the social protection network and the recovery of the minimum wage, growing formalization also helps make the labour market increasingly inclusive. Lastly, improvements in the educational profile of the economically active population, although still slow, have helped reduce labour-market inequalities.

The figure below illustrates the pace of the expected continuous fall in the Gini coefficient. By 2015, the index should be below 0.50, according to the targets set in the 2012-2015 multi-year plan (PPA).

Brazil: Gini coefficient, 1995-2015
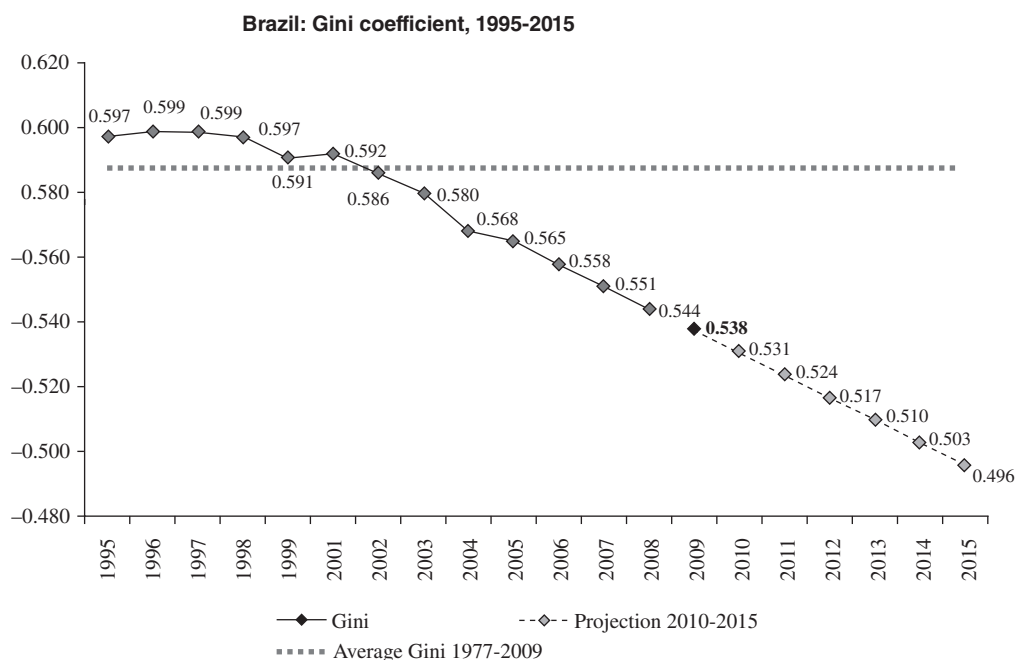
Source: Ministry of Planning, Budget and Management, "Mensagem presidencial. Projeto de Lei Orçamentária – 2009" [Presidential message, Draft Budget Law, 2009], Brasilia [online] http://www.planejamento.gov.br/secretarias/upload/Arquivos/sof/ploa09/080827_ploa_Mensagem09. pdf; and "PPA 2012-2015 – Plano Mais Brasil" [2012-2015 Multi-year plan – 'More Brazil Plan'], Brasilia [online] http://www.planejamento. gov.br/noticia.asp?p=not&cod=7571&cat=155&sec=10.
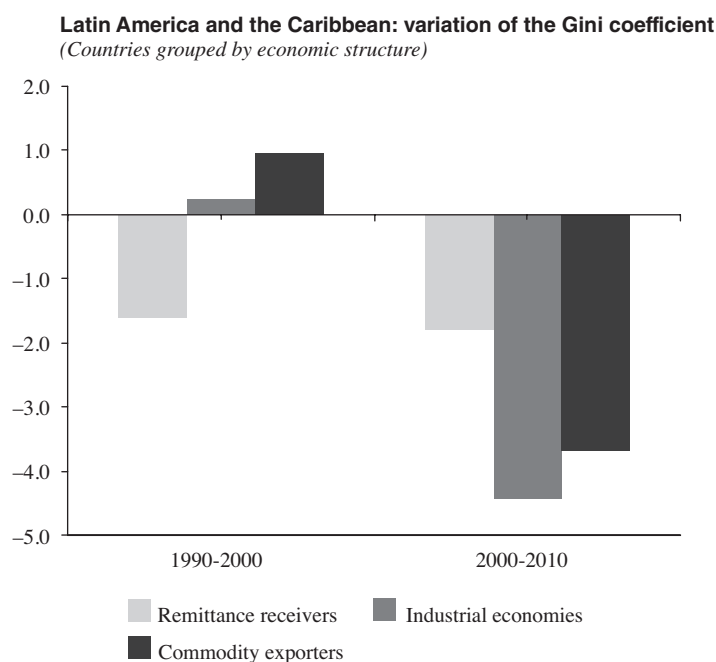
FIGURE 4

Latin America and the Caribbean: variation of the Gini coefficient
(Countries grouped by economic structure)

Source: prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC) and G. Cornia (2012), *"Inequality trends and their determinants: Latin America over 1990-2011"*, *Working Papers*, No. WP2012/09, World Institute for Development Economics Research (WIDER), 2012.

III

Determinants of the income distribution

There is an abundant and varied literature on the determinants of the income distribution (Lerda, 2009). In its *2006 World Development Report* the World Bank states that "Equity is defined in terms of two basic principles. The first is equal opportunities: that a person's life achievements should be determined primarily by his or her talents and efforts, rather than by pre-determined circumstances such as race, gender, social or family background. The second principle is the avoidance of deprivation in outcomes, particularly in health, education and consumption levels".

ECLAC has made various contributions to the debate on the meaning of equity. As noted by Infante and Sunkel (2009): "ECLAC (1964) contended that the structural heterogeneity of Latin America manifested itself at that time in the differing productivity levels of workers in the various production strata, a characteristic of the region's economy that also lay at the root of its unequal income distribution". The concept of productive

convergence is therefore crucial for economic growth with equity, as stressed in successive ECLAC publications (2008 and 2010).

Why is the income distribution more equal in some countries than in others? Concepts such as the "empty box syndrome" express the region's decades-long incapacity to open the "black box" of technical progress. Thus, according to Fajnzylber (1990) an internationally competitive industrial system, in a social context that has surpassed a minimum equity threshold (agrarian reform), could help promote equality in the country through the following channels at least: a relatively broader distribution of ownership, associated with the creation of small and medium-sized enterprises; dissemination of labour skills; faster employment growth, associated with a dynamic international market; rising levels of productivity and pay; a broader-based and more socially integrated education system, which is an essential requirement for sustaining international

competitiveness; and, lastly, dissemination of the industrial rationale throughout society, through both formal and informal channels, thereby making society more receptive to absorbing technical progress, which in turn will help raise productivity and distribute the fruits of technical progress more equitably among society at large http://www.eclac.cl/publicaciones/ xml/0/27240/lcg2322e.pdf].[2]

Without doubt, this vision of "productive convergence" is crucial for understanding the dynamics of growth with equity in emerging countries (Infante and Sunkel, 2009); but it is also interesting to consider more explicitly the effects of political stability, institutions and fiscal policy.

In *"The Fiscal Covenant. Strengths, Weaknesses, Challenges"* ECLAC (1998), it is argued that "Society usually entrusts the State in particular with a crucial role in the promotion of social equity, and a fiscal covenant would be incomplete and unsatisfactory if that role were not provided for or were ignored or inadequately performed. Important aspects of that role are the promotion of equal opportunity, as expressed, for example, in education, health care and employment, and the task of protecting vulnerable members of society; nor should equity in the Government's collection of the resources it needs to perform these and other tasks be left out of the reckoning."

ECLAC (2000) views equity as the " central pillar around which the region's development patterns need to be reoriented" and as the basic yardstick for measuring the quality of development, defined as "reduction of social inequality in all its various manifestations". This fact that view of the topic is conceptually very broad opens the way for multiple public interventions to ensure better standards of equity, as illustrated by the following passage: "… the sources of inequality are to be found in different areas of social and economic life, and action to further equity has to take this variety into account. For this reason, it is important to broaden the idea of equity by taking into account different aspects connected with equality of opportunities at the beginning and during the course of the educational and employment cycles, equality of access to material wellbeing but also to participation in decision-making and in public life, equality of access to systems of justice, citizen security and healthy lifestyles, and equality of access to numerous sources of knowledge and information and to social and other support networks."

ECLAC (2010) contends that "If the challenge of equality is to be properly addressed, the region must move beyond the 'minimalist' view of the welfare state and social policy that prevailed during the 1990s and move towards the construction of a universal basic social safety net that will become a structural rather than a residual feature of the development model."

Ultimately, the income distribution is only one facet of this broader concept of equality, which encompasses the provision of multiple public goods and services, for which the demand and volume produced will depend, in democratic societies, on majority vote and the building of consensus-based community mechanisms. Musgrave and Buchanan (1999) argue that the issue of public choice is an inherent part of the fiscal process — something that the specialized technocracy tends to ignore.

Afonso, Schuknecht and Tanzi (2008) claim that, at any point in time in a given country, the "primary" income distribution (that is, before government intervention) would be determined by the following factors:

(i)   The inheritance of tangible and material wealth.
(ii) The inheritance of human capital, including an infinite number of assets that determine a person's social capital.
(iii) Societal arrangements and norms, such as whether individuals tend to marry individuals with similar wealth or social capital, and including real or de facto caste and tribal systems.
(iv) Past government policies.

The aforementioned authors add "individual talent" to that list, which certainly has made a few individuals rich on an isolated basis. It is more important, however, to highlight the preponderance of hereditary factors, which cannot be changed in the short run and relate basically to the initial social position of individuals in society. If equity is defined in terms of equal opportunities, the prior income distribution is clearly an important explanatory factor of the current value of the Gini coefficient. Past policies will have also changed the initial conditions, although it is hard to isolate such policies from current income distribution policies, or the effect of past government policies on societal change.

The inertia shown by the inequality indicators may reflect the non-existence of policies capable of changing this situation; but it also stems from an unequal distribution of both physical and human assets. For example, Deininger and Olinto (2000) find that the Gini coefficient for the distribution of land ownership was 0.81 in Latin America, compared to 0.60 for the

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[2]   Text extracted from Torres (2006, p. 347).

world as a whole. In terms of the distribution of years of schooling, the Gini coefficient is 0.42 in Latin America compared to 0.27 in industrialized countries. These results are corroborated in the study by De Ferranti and others (2004), which finds correlations of 0.75 between the inequality coefficient and years of schooling, and 0.5 with respect to the distribution of land ownership in the region.

Another explanatory factor directly concerns the labour market's capacity to enhance social mobility, which is also linked to labour demand and hence the level of economic activity. The level of unemployment (or the rate of employment) and GDP are thus important factors explaining changes in the income distribution; and this implies a potential link between the level of incomes and their distribution, since the quantity and quality of the supply of public goods and services will depend on tax-revenue capacity (the main determinant of which is the level of income).

Government intervention is known to exert a significant influence on the Gini coefficient — through the level and structure of taxes, expenditure policies and regulations. For example, in the OECD, the Gini coefficient before taxes and transfers is 0.45, but it falls to 0.31 after direct government redistributive actions (which include the progressiveness of the tax system, one third of the effect, and monetary transfers to lower-income groups) (OECD, 2008). In these areas alone, fiscal action has a tremendous capacity to correct the primary income distribution.

In the case of Latin America, and with regard to public spending, mechanisms such as conditional transfers — to improve the inclusion of the more vulnerable sectors — ought to play an important role in explaining changes in the Gini coefficient, but their current volume renders their effect insignificant (ECLAC, 2011).

In addition, the supply of public goods generates indirect and longer-term effects, since government policies to raise the productivity of the poorest groups enhances equity. No one can doubt that public expenditure on justice, citizen security, infrastructure and public transport, health, job training, social inclusion, and so many others, benefits the poorest sectors more than proportionately, by enabling them to participate in the labour force under better conditions.

The level and progressiveness of taxes also has a direct effect on the income distribution. The capacity of the tax system to correct unequal distributions will depend on the amount of revenue obtained and the structure of tax rates in relation income levels — but also on income-tax evasion and the number of exemptions

available. In the medium term, the tax system can also affect job creation (for example if there are many levies on employers), as well as individual effort and family size, all of which affect the trend of the Gini coefficient.

1. Empirical evidence

Although Fajnzylber (1990) uses the ratio between the wealthiest decile (10%) and the four poorest deciles (40%) as a proxy variable for inequality, the most widely used indicator in income-distribution studies is the Gini coefficient. Given the scarcity and heterogeneity of alternative data for Latin American countries, the latter indicator will be used in the estimations performed in this study (see box 2).

The study by Afonso, Schuknecht and Tanzi (2008) for OECD countries[3] provides an interesting analytical framework for replication in Latin American countries. The starting point is a cross-section estimation including both OECD and Latin American and Caribbean countries (details in table 2) for the years 2000 and 2006. In a second stage, the analysis estimates panel data for the sample of Latin American and Caribbean countries, in order to specify the effect of the identified determinants in the region. Fiscal, macroeconomic, social and institutional variables are used, broken down according to the requirements of the analysis. The estimates are made for the period 1990-2010.

As shown in table 3, the variables considered are: *fiscal* (total public expenditure, social public spending, public spending on education, transfers and current subsidies, capital expenditure, tax revenue, direct tax revenues, income taxes, property taxes, indirect tax revenues, general taxes on goods and services, indicator of tax progressiveness); *social* (net secondary school enrolment rate, educational achievement (indicators of the Programme of International Student Assessment (PISA)), initial income distribution; *macroeconomic* (per capita income in PPP terms, initial per capita income, unemployment rate, inflation, GDP growth rate); and *institutional*.

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[3] We are grateful to these authors for having made their databases available for this study.

BOX 2
Definition of the Gini coefficient

The Gini coefficient is defined on the basis of the Lorenz curve, which describes the cumulative percentage of total income received by different percentages of the population.

The coefficient is calculated as the area between the diagonal and the Lorenz curve (area A in the figure) divided by the area under the diagonal (area A+B). In situations of perfect equality, the Lorenz curve would coincide with the diagonal, area A would disappear, and the Gini coefficient would be 0, indicating the total absence of inequality. At the other extreme (a situation in which all income was owned by a single person), the Lorenz curve would coincide with the axes of the graph, area B would disappear, and the Gini coefficient would be 1, indicating total inequality.
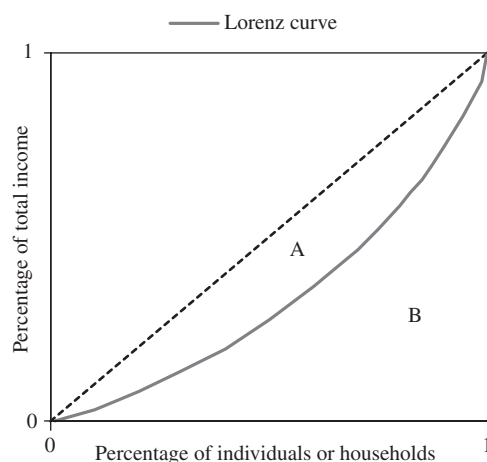
Source: prepared by the authors.

TABLE 2
Selected samples, period 1990-2010

Region	Countries included in each sample
Latin America and the Caribbean (18 countries)	Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela (Bolivarian Republic of)
Organization for Economic Cooperation and Development (OECD) (27 countries)	Australia, Austria, Belgium, Canada, Czech Republic Denmark, Finland, France, Germany, Greece, Holland, Hungary, Ireland, Italy, Luxembourg, New Zealand, Norway, Poland, Portugal, Republic of Korea, Slovak Republic, Spain, Sweden, Switzerland, United Kingdom, United States, Japan

Source: prepared by the authors.

TABLE 3

Description and sources of the variables used

Variables	Description	Source
Gini coefficient	Inequality index, values between 0 and 1	CEPALSTAT (LAC) OECD database World Bank database
Initial income distribution	Gini coefficient, 1970	World Bank database
Fiscal		
Total public expenditure	Total public expenditure as a percentage of GDP	CEPALSTAT (Latin America) World Bank database
Social spending	Public social spending as a percentage of GDP (excluding social spending on education)	CEPALSTAT (LAC) World Bank database
Transfers and subsidies	Current transfers and subsidies as a percentage of GDP	CEPALSTAT (LAC) World Bank database
Public capital expenditure	Public capital expenditure as a percentage of GDP	CEPALSTAT (LAC))
Income taxes	Income tax revenue as a percentage of GDP	CEPALSTAT (LAC) OECD Revenue Statistics
Property taxes	Property tax revenue as a percentage of GDP	CEPALSTAT (LAC) OECD Revenue Statistics
General taxes on goods and services	Revenue from general taxes on goods and services as a percentage of GDP	CEPALSTAT (LAC) OECD Revenue Statistics
Tax progressiveness indicator	Ratio of direct tax revenue/indirect tax revenue	Prepared by the authors on the basis of data from CEPALSTAT (LAC) and OECD Revenue Statistics
Education		
Public expenditure on education	Public spending on education as a percentage of GDP	CEPALSTAT (LAC) World Bank database
Secondary school enrolment rate	Net secondary school enrolment rate (%)	World Bank database
Measurement of quality: indicator Programme of International Student Assessment (PISA)	PISA indicator	OECD PISA database
Human capital index	Adults with tertiary and secondary education compared to adults with primary education (population between 25 and 65 years of age)	Martorano and Cornia (2011)
Years of schooling	Years of formal schooling among the adult population (between 25 and 65 years of age)	Martorano and Cornia (2011)
Institutional		
Public stability index	(1/2)*political stability +(1/2)*rule of law	Worldwide Governance Indicators database
Government effectiveness	Government effectiveness index	Worldwide Governance Indicators database
Voice and accountability	Index of voice and accountability, measuring civil, human and political rights	Worldwide Governance Indicators database
Macroeconomic		
Per capita income (PPP)	Income per capita at purchasing power parity (annual percentage rate of change)	World Bank database
Unemployment rate	Annual average rate (%)	CEPALSTAT World Bank database
Real exchange rate (RER)	RER (index)	CEPALSTAT (LAC)
Price index	Variation in the consumer price index (CPI), annual average	CEPALSTAT (LAC)

Source: prepared by the authors.

PISA: Programme of International Student Assessment.
PPP: Purchasing power parity.

2. Cross-section regressions: results for the OECD and Latin America and Caribbean

Table 4 provides a summary of cross-section regression estimates. The equations estimated by Afonso, Schuknecht and Tanzi (2008) for 22 OECD countries are extended to the Latin American and Caribbean countries that reported

PISA indices in 2000 (equations (1') and (2')). Then, with the new sample, the exercise is repeated for 2006 to detect any breaks in trend; and lastly, equation (3') includes the 18 Latin American and Caribbean countries, with the PISA indices replaced by the net secondary school enrolment rate (a variable that does not indicate quality, as in the previous case, but the coverage of the educational system).

TABLE 4

**OECD and Latin American and Caribbean: determinants
of the income distribution, 2000-2006**

Dependent variable	Gini coefficient						
Sample	OECD [a]		LAC and OECD (logarithms)		LAC and OECD (logarithms)		
Period	2000		2000		2006		
Equations	(1)	(2)	(1')	(2')	(1')	(2')	(3')
Independent variables							
Transfers and subsidies/GDP	-7.13*** (-3.93)		-0.34*** (-3.27)		-0.26** (-2.38)		
Social spending/GDP [b]		-2.51*** (-4.10)		-0.086*** (-3.30)		-0.22*** (-3.08)	**-0.13*** (-1.89)**
Personal income-tax/GDP	-1.51 (-1.17)		-0.15*** (-2.47)		-0.066 (-1.04)		
Total PISA index (*Educational attainment*) [c]	-0.86*** (-2.92)		-1.32*** (-3.99)		-1.64*** (-4.30)		
PISA index (*Problem-solving*) [c]		-0.90*** (-6.13)		'-1.25*** (-5.74)		'-0.80** (-2.60)	
Gini coefficient 1970		0.47*** (4.85)		0.50*** (6.19)		0.45*** (3.57)	**0.77*** (13.5)**
Public expenditure on education/GDP							**-0.08 (-0.12)**
Secondary school enrolment rate							**-0.22 (-0.91)**
No. of observations	22	11	27	16	31	18	**31**
Adjusted R²	**0.56**	**0.92**	**0.86**	**0.98**	**0.73**	**0.93**	**0.93**

Source: prepared by the authors.
Note: Values statistically significant at 1% "***", 5%"**" and 10%"*". t-statistics in brackets.

[a] Results reported in Afonso, Schuknecht and Tanzi (2008).
[b] Social spending does not include expenditure on education.
[c] The PISA index for Latin America includes results only for Argentina, Brazil, Chile, Mexico and Uruguay.
OECD: Organization for Economic Cooperation and Development.
LAC: Latin America and the Caribbean.
GDP: Gross domestic product.
PISA: Programme for International Student Assessment.

In Afonso, Schuknecht and Tanzi (2008), transfers and subsidies and social spending, alternatively, are highly significant variables, as are the coefficient of the initial distribution (1970 Gini coefficient) and educational attainment, measured through the

aggregate PISA indicator — in particular the specific "problem-solving" index. Institutional variables were not significant, nor were control variables such as per capita income and unemployment. Personal income tax was also non-significant.

Extending this sample to a number of Latin American and Caribbean countries — those that use the PISA measurement — produces very similar results. In the first specification, with transfers and subsidies as the explanatory variable (equation (1')), the significant variables were income tax (at least in 2000) and educational attainment. When aggregate social spending is used (equation (2')), this is significant only for 2006, while the effect of the tax variable is diluted, probably owing to problems of multi-collinearity. The regressions tend to be highly dependent on the auto-regressive variable of the initial Gini coefficient. Nonetheless, the greatest effect is obtained from education-related variables.

Figure 5 shows the close fit of observations around the straight-line regression between the Gini coefficient and the PISA measurement; and it also reveals the considerable backwardness of education levels in Latin American countries. For 15-year-old students who did the PISA tests in the region, this is reflected in an average difference of about two years' schooling compared to the Republic of Korea and Finland (OECD/ECLAC, 2011).

Other relevant partial correlations are illustrated in figures 6 and 7.

A second stage attempted to include the 18 Latin American countries in the sample (see equation (3')), but this impaired the quality of the statistical fit as the new variables considered were not significant. This result can be explained mainly by the lack of an adequate indicator of education quality for the region.

Although the results are revealing, it is important to target the analysis on Latin American countries to explore alternative variables and perform cross-section regressions to confirm whether the variables previously analysed maintain their explanatory power through time.
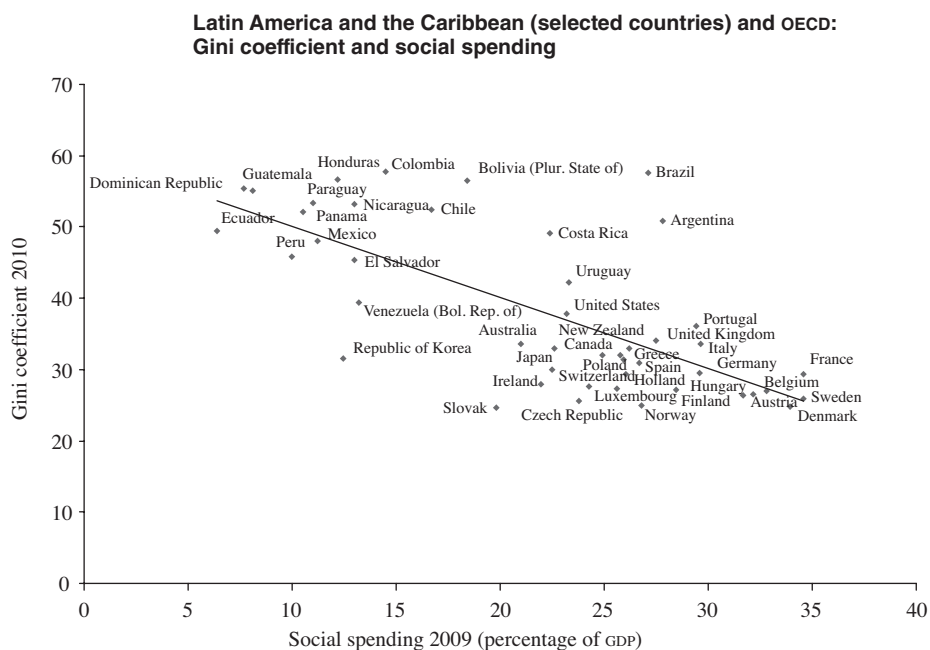
FIGURE 5

**Latin America (selected countries) and OECD:
Gini coefficient and PISA index**
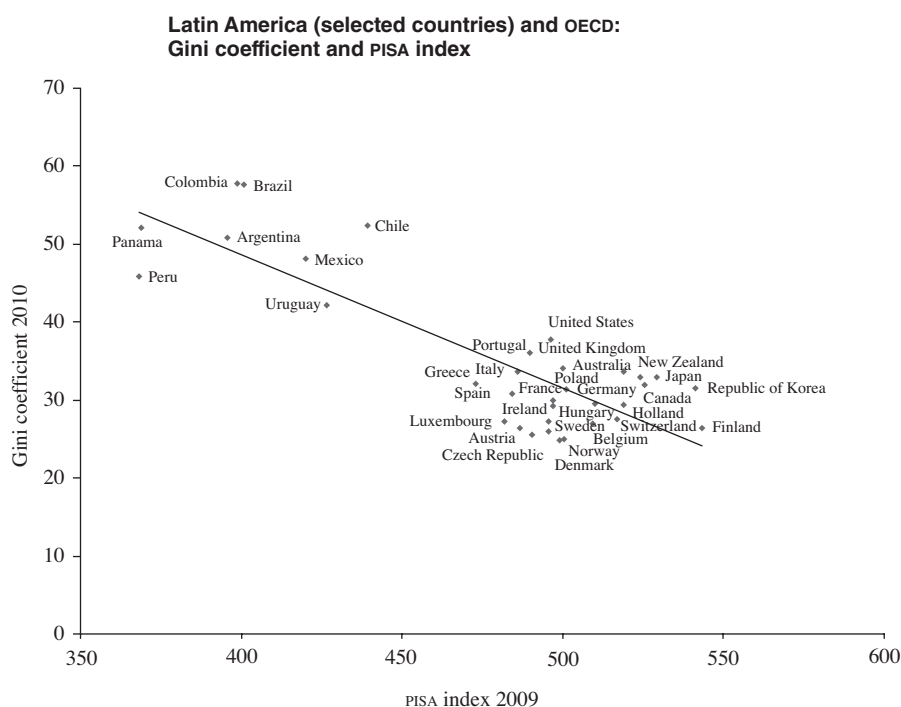
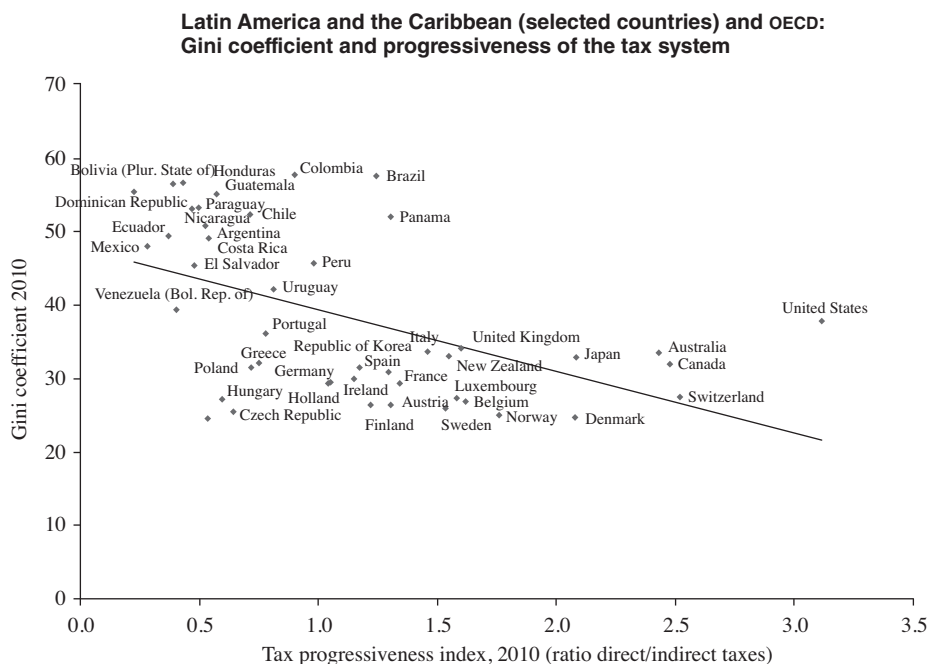*Source*: prepared by the authors on the basis of Organization for Economic Cooperation and Development (OECD), "Database - PISA 2009" [online] http://pisa2009.acer.edu.au/.

PISA: Programme for International Student Assessment.

FIGURE 6

Latin America and the Caribbean (selected countries) and OECD:
Gini coefficient and social spending

Source: prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC) for Latin American and Caribbean countries and OECD.Stat for OECD countries.
GDP: Gross domestic product.

FIGURE 7

Latin America and the Caribbean (selected countries) and OECD:
Gini coefficient and progressiveness of the tax system

Source: prepared by the authors on the basis of official data from the Economic Commission for Latin America and the Caribbean (ECLAC) for Latin American and Caribbean countries and from the Organization for Economic Cooperation and Development (OECD), Revenue Statistics 1965-2010, 2011 for OECD countries.

3. Panel regressions: Latin America

Table 5 shows the panel estimations for the 18 Latin American countries (see table 2) considering the relevant variables previously included in table 4. These estimations differ particularly in terms of the educational-achievement indicators, among which the human capital indicator (the ratio of the number of individuals with secondary and tertiary education compared to those with primary education) is the most important. This variable is also used in the estimations performed by Cornia (2012).

In terms of fiscal variables, the best fit is obtained by separating social spending from public expenditure on education (see equation (4) of table 5). The tax progressiveness index is also significant in the latter equation, although with a smaller coefficient than the expenditure variables. Figures 8 and 9 show that both an increase in social spending and a change in tax composition can explain the improvements in the Gini coefficient in recent years.

TABLE 5

Equations for Latin American and Caribbean, 1990-2010

Sample	Latin America and the Caribbean (*logarithms*)			
Dependent variable	Gini coefficient			
Period	1990-2010			
Independent variables	(1)	(2)	(3)	(4)
Fiscal				
Transfers and subsidies/GDP	-0.26* (-1.69)	-	**-0.26*** **(-1.89)**	**-**
Social spending/GDP [a]	-	-0.35* (-1.64)	**-**	**-0.42*** **(-2.55)**
Public capital expenditure/GDP	-0.19 (-1.27)	-0.18 (-1.28)	**-0.25*** **(-1.78)**	**-0.23*** **(-1.68)**
Tax progressiveness index (*ratio direct/indirect taxes*)	-0.023* (-1.64)	-0.015 (-1.06)	**-0.013**** **(-2.22)**	**-0.014**** **(-2.58)**
Income taxes/GDP	0.01 (0.77)	-0.001 (-0.09)	**-**	**-**
Institutional				
Stability index ((1/2)*political stability +(1/2)*rule of law)	-0.040** (-2.34)	-0.046*** (-2.78)	**-0.037**** **(-2.30)**	**-0.04**** **(-2.56)**
Government effectiveness	-0.003 (-0.44)	-	**-**	**-**
Voice and accountability	-0.004 (-0.005)	0.012 (1.39)	**-**	**-**
Educational attainment				
Public expenditure on education/GDP	-0.008 (-0.23)	-0.023** (-2.33)	**-0.014*** **(-1.73)**	**-0.02**** **(-2.65)**
Human capital indicator (*Individuals with tertiary and secondary education/individuals with primary education*)	-0.085*** (-3.47)	-0.10** (-2.33)	**-0.07**** **(-2.85)**	**-0.10**** **(-3.91)**
Secondary school enrolment rate	-0.023*** (-2.60)	-	**-0.02**** **(-2.62)**	**-**
Years of schooling	-	-0.004 (-0.59)	**-**	**-**

Table 5 (concluded)

Sample	Latin America and the Caribbean (*logarithms*)			
Dependent variable	Gini coefficient			
Period	1990-2010			
Independent variables	(1)	(2)	(3)	(4)
Macroeconomic				
Real exchange rate (RER)	0.021** (2.20)	0.023** (2.25)	**0.025***** **(2.77)**	**0.026***** **(2.71)**
Consumer price index (CPI) (*annual variation*)	-0.001* (-1.87)	-0.001 (-1.44)	-	-
Unemployment rate	0.52*** (6.48)	0.44*** (6.10)	**0.51***** **(7.68)**	**0.44***** **(7.23)**
Per capita income (PPP) (*annual variation*)	-0.042 (-0.69)	-0.061 (-0.99)	-	-
No. of observations	**357**	**360**	**375**	**378**
Adjusted R²	**0.86**	**0.85**	**0.86**	**0.85**

Source: prepared by the authors.
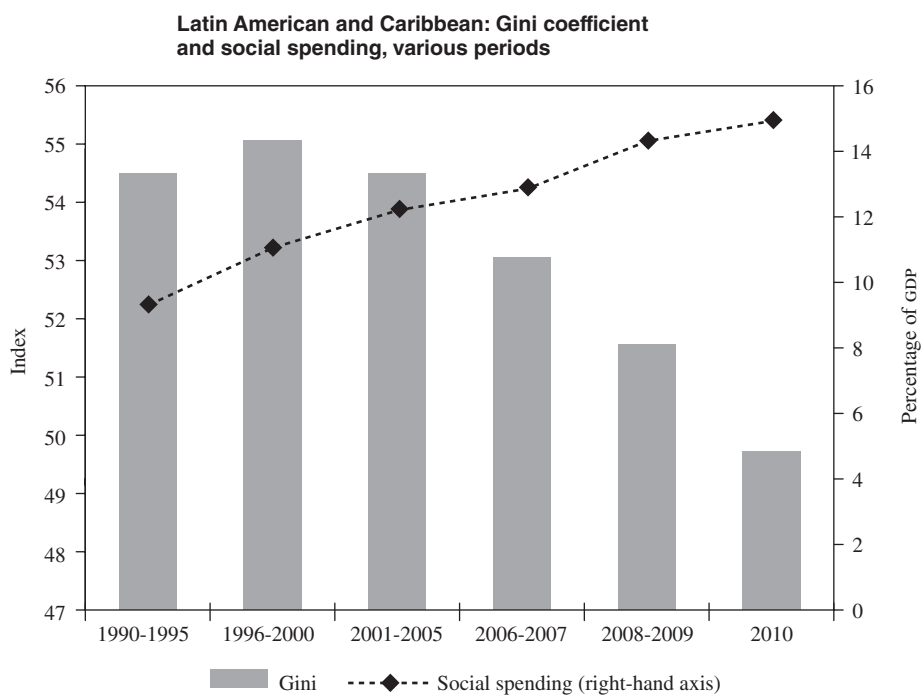Notes: Values statistically significant at 1% "***", 5%"**" and 10%"*".
[a]   Social spending does not include expenditure on education.
t-statistic in brackets.
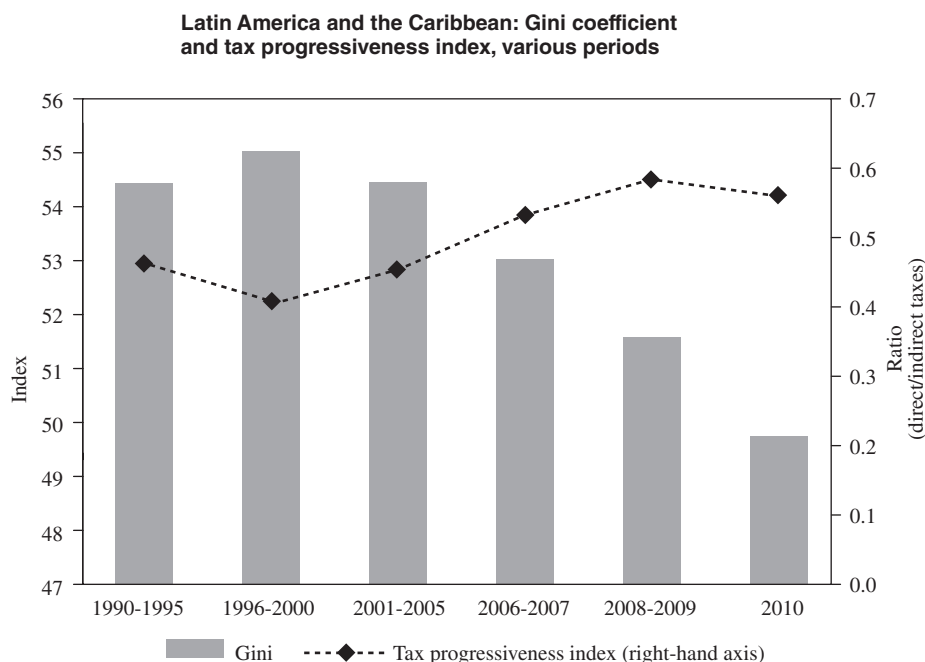GDP: Gross domestic product.
PPP: Purchasing power parity.

FIGURE 8

**Latin American and Caribbean: Gini coefficient
and social spending, various periods**

Source: prepared by the authors.

GDP: Gross domestic product.

FIGURE 9

**Latin America and the Caribbean: Gini coefficient
and tax progressiveness index, various periods**
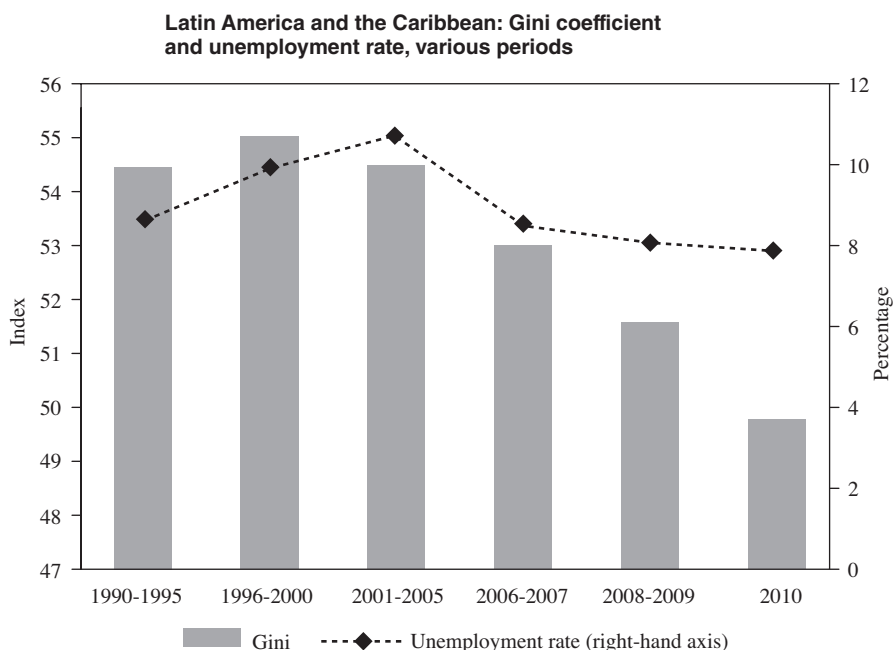

Source: prepared by the authors.

Nonetheless, the unemployment rate is the variable that is most consistently significant and of high impact: for each percentage point reduction in the unemployment rate, the Gini coefficient drops by 0.44 points. Clearly, improvements in formal employment and the consequent increase in labour incomes largely explains recent progress (see figure 10). As noted in ECLAC (2011), a breakdown of variations in inequality shows that income per adult is the main factor driving the distributive improvement. In 10 of the region's countries, the variation of labour income explains 90% or more of the total improvement; in another five countries, the change in non-labour incomes, basically transfers, contributes 40% or more to the total reduction in inequality.

Although the breakdown described above provides an accounting methodology to explain the changes, the econometric estimation makes it possible to highlight the effect of other variables, such as educational attainment as mentioned above, or institutional variables. The stability index calculated by the World Bank also seems

to have an important effect. Unexpectedly, the inflation rate does not appear as a determinant in the period studied, whereas the real exchange rate is significant. An explanation for this is that the recent falls in the real exchange rate are correlated with lower inflation rates in the region. Lastly, per capita income was not significant, because, as discussed in earlier sections, various trends in the level and distribution of income coexisted in the estimation period.

The equations summarized in table 5 thus report significant effects on the Gini coefficient. The empirical evidence corroborates the results reported in other recent studies, showing that public policies have a significant effect on the income distribution — both directly through social spending and tax progressiveness, and indirectly through the quality of education and institutions. The evidence also stresses the primordial role of labour incomes in recent improvements. In these estimations, the initial (or lagged) Gini coefficient is no longer significant.

FIGURE 10

**Latin America and the Caribbean: Gini coefficient
and unemployment rate, various periods**

Gini   - - -◆ - - - Unemployment rate (right-hand axis)

Source: prepared by the authors.

IV

Concluding remarks: options for overcoming the "empty box syndrome"

Although not their main focus, studies relating to poverty reduction and improving the income distribution are often underlain by conflicting views of the role of the state — whether as a catalyst of "productive transformation with equity" or as promoter of the corrective actions needed in the social domain. In the words of Infante and Sunkel (2009), "It seems vital for redistributive policies to be progressively supplemented with distributive ones to narrow productivity divides and thus improve the autonomous incomes of the most disadvantaged sectors. Distributive policies could thus bring about a real reduction in inequality both of incomes and of access to opportunities between the different groups in the social structure…"

This dilemma between productive development and social policies calls to mind the Chinese proverb: "Give and man a fish and you feed him for a day; teach a man to fish and you feed him for the rest of his life." Clearly, there are no categorical solutions to this dilemma between development policies and welfare actions, because experiences of growth with equity are highly varied, and the levels and composition of public expenditure equally so.

It is worth noting that the ever-present dilemmas between growth and equality can be dissipated by prioritizing expenditure that promotes economic growth along with formal employment and access to public goods. The task of enhancing the quality of public expenditure in Latin America and the Caribbean thus involves sustained investment in physical and human capital, and also in innovation and knowledge (ECLAC, 2010).

This article has sought to identify empirical evidence explaining recent improvements in the income distribution in Latin American countries, as measured by the Gini coefficient; and it has shown that increases and improvements in public social spending, education,

public investment and the composition of taxes have had positive effects.

The article also highlights the importance of the macroeconomic cycle, proxied by the unemployment rate, for changes in the Gini coefficient. Nonetheless, while it is important to stress the role of government, and fiscal policy in particular, for achieving inclusive development, the private sector is also important in this process, specifically for its ability to invigorate investment and create jobs.

As Fajnzylber (1990) put it, to achieve the two central objectives of development —authentic competitiveness and equity — many institutions and many policies are needed. But we will have neither competitiveness nor equity unless we address human resources and their education, training and integration into scientific and technological knowledge. Talking the talk in terms of equity or competitiveness, even both at the same time, is mere rhetoric unless a substantive and consistent effort is made to achieve them.

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