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Redistribution and development in Latin America: A quantile regression approach

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Abstract

This study examines the relationship between redistributive efforts and human development in 12 Latin American countries over the period 2000–2021. With the aim of evaluating the link between both variables throughout the distribution the analysis is based on quantile regression. Overall, the results suggest that greater redistribution is associated with higher development. This result holds for all ranges of the distribution and is robust to different specifications. The analysis of the redistributive effect of taxes and government transfers is extended to the different dimensions of development—health, education and economy—, finding that education is the component that is most significantly affected by increases in redistribution. Positive coefficients are also obtained for the other two components, although they are only significant at the centre of the distribution in the case of life expectancy, and at high levels of per capita income.

Keywords: income inequality; redistributive policy; taxes; government transfers; human development

JEL Classification: C50; D30; E62; H50

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1. Introduction

There is increasing social awareness of income inequality. While a sustained increase in inequality has been observed in the United States and Europe in recent decades (Piketty and Saez, 2014), the reverse trend has been apparent in Latin America since the 2000s (Lustig et al., 2013). The fundamental reason for this improvement in income distribution can be found in a greater redistributive effort in the region (Goñi et al., 2011). Governments' main tools to mitigate income inequality are taxes and transfers. The application of fiscal incidence analysis has made it possible to evaluate the impact of different fiscal systems and types of transfers on reducing inequality in some of the main countries in the region (Lustig et al., 2014).

However, while abundant literature has focused on the analysis of the relationship between inequality and economic growth (Castelló-Climent, 2010; Forbes, 2000) or inequality and financial development (De Haan and Sturm, 2017; Escudero, 2023), until now the direct impact of redistributive efforts on development has been overlooked, especially in Latin America. The fundamental reason lies in the lack of comparable information. This study seeks to fill this gap by focusing on the analysis of the aggregate impact that redistribution has had on development in the region in the last two decades.

The present work aims to contribute to this literature by taking advantage of the recent availability of historical series on the distribution of income before and after taxes provided by the *World Income Database* (WID.world), as well as the use of alternative modeling techniques that allow us to explore the existing link between redistribution and development across quantiles. This study differs from previous research in the following aspects. First, since the WID contains data on income before and after taxes, we are able to estimate the impact of public redistributive policies as the difference between market and net Gini coefficients. Therefore, while most studies on redistribution have made use of fiscal incidence analysis, in this work we apply the "pre-post" approach proposed by Lupu and Pontusson (2011) to estimate the redistributional effect of taxes and transfers.

Second, given that the WID provides historical series on the distribution of income, by using the greatest amount of information available, we constructed a panel with the aim of incorporating a temporal dimension into the analysis, thus differentiating our research from a large number of the existing studies, which have carried out in-depth cross-sectional analyses focused on one country (Arauco et al., 2014; Higgins and Pereira, 2014; Jaramillo, 2014; Scott, 2014).

Third, the study covers economies that have been very little studied until now. Latin American countries that have previously been mostly the object of study, are Argentina, Bolivia, Brazil, Chile, Colombia, Mexico and Peru (Caminada et al., 2019; Engel et al., 2007; Goñi et al., 2011; Lustig, 2016). Making use of all internationally comparable information, the present study expands the set of economies analyzed to twelve, incorporating countries such as Costa Rica, Cuba, the Dominican Republic, Ecuador, and El Salvador, which have been understudied up until now.

Fourth, by means of quantile regression we assess the effective impact of redistribution on development across different quantiles of the distribution. This approach is particularly suitable due to the lack of a theoretical framework that links the two variables. Additionally, given the complex nexus between these phenomena, different ranges of redistribution may lead to unequal variations of development. In this context, quantile regression is especially appropriate for uncovering relationships between variables in cases in which there is no clear link or only a weak association between their means.

Finally, as a robustness check we extend the analysis to different dimensions of human development beyond economic growth—health and education—that have been proved to be channels through which inequality can be reduced (Castells-Quintana et al., 2019; Easterly, 2007; Ferreria et al., 2022; Martinez, 2016; Pickett and Wilkinson, 2015; Suárez and López, 2023).

The rest of the study is structured as follows. The next section reviews the literature. Section 3 describes the data that are used. Section 4 presents the methodology and discusses the results. Finally, Section 5 draws some conclusions.

2. Literature review

Inequality in the distribution of income has implications in numerous areas, and society's growing awareness of its potential long-term negative effects is reflected in the large number of studies conducted (Alvaredo et al., 2018; Caruso Bloeck et al., 2019; Iniguez-Montiel and Kurosaki, 2018). In the economic field, the debate has focused fundamentally on the relationship between inequality and development, mostly in the form of economic growth, but the impact of redistributive policies on development has been understudied, primarily due to a lack of available information to estimate the effective impact of taxes and transfers (Granger et al., 2022).

At a theoretical level there is a certain consensus regarding the transmission channels between inequality and development (Ferreira et al., 2022; Neves and Silva, 2013). Gründler and Scheuermeyer (2018) synthesized the transmission mechanisms between inequality and development into five categories: differential saving rates, credit market imperfections, endogenous fertility, socio-political unrest, and endogenous fiscal policy. According to Goñi et al. (2011), high inequality can be a powerful drag on development, due to (i) its connection to poverty and its growth-deterring effect (López and Servén, 2010), (ii) its debilitating impact on the effect of income growth on poverty—the more unequal income distribution is, the faster the rate of growth required to achieve a given reduction in poverty—, and (iii) its potential role as a source of social tension, which in turn tends to undermine the legitimacy of policies and institutions as well as their stability, and ends up discouraging investment and thereby growth. The combination of these three factors, which are exacerbated by market imperfections and financial constraints, makes poverty self-perpetuating and causes inequality to lie at the core of the vicious circles of stagnation and poverty in which many developing countries appear to be stuck.

From a theoretical point of view, the first attempts to analyze the complex relationship between redistribution and growth were based on the rational choice theory, and more specifically on the formal model of taxation by Meltzer and Richard (1981), which postulates that a more unequal income distribution would create a majority in favor of more redistribution. This theoretical framework has been generalized through successive contributions integrating alternative mechanisms. For example, Alesina and Rodrik (1994) and Perotti (1996) extended the model by allowing two separate mechanisms: one from income inequality to redistributive policies (political mechanism), and antother from redistribution to economic growth (economic mechanism).

While there is a consensus regarding the existence of a close relationship between inequality and redistribution (Borge and Rattsø, 2004; Claveria and Sorić, 2024), there is mixed evidence with respect to the prevalence of the political mechanism: some studies found that redistributive efforts tend to be greater in countries with higher income inequality (Berg et al., 2018; Milanovic, 2000), while others obtained evidence to the contrary (Benabou, 2000; de Mello and Tiongson, 2006).

Taxes and transfers are governments' main redistributive tools to alleviate the negative effects of a growing concentration of income among a small fraction of the population. However, as evidenced by Lindert (2004), the resources devoted to the poor have been fewer in the nations in which poverty and inequality have been greater.

Focusing on countries from the Organization for Economic Co-operation and Development (OECD), Joumard et al. (2012) found that taxes and transfers reduced inequality in disposable income relative to market income, although the effect varied notably across the OECD countries. Overall, in a review of the literature examining the link between income inequality and government spending, Anderson et al. (2017) found a moderate negative relationship between government spending and income inequality.

The degree to which greater redistribution ends up being reflected in lower inequality is conditioned by the effectiveness of redistributive policies. Anderson et al. (2017) noted that the redistribution effect tends to be less effective in less developed countries. This is particularly evident in the case of Latin America, where despite a general increase in redistributive policies, their efficiency in reducing inequality is far from that observed in Europe (Goñi et al., 2011).

According to Lustig (2016), success in fiscal redistribution is driven primarily by redistributive effort—which can be computed as the share of social spending to the monetary value of final goods and services produced in a country—, and the extent to which transfers are targeted to the poor and direct taxes targeted to the rich. Using comparative fiscal incidence analysis, Goñi et al. (2011) found that in most Latin American countries the redistributive impact of taxes was lower than that of transfers. The reason for this asymmetry lays fundamentally in the fact that, in spite of direct taxes being generally progressive, their redistributive impact was usually small due to their relative low weight as a share of the gross domestic product (GDP) (Lustig et al., 2014).

Higgins and Pereira (2014) showed that relative to other countries in Latin America, Brazil had high rates of taxation and large social spending. However, the authors found that indirect taxes paid by the poor often surpassed the direct transfers and indirect subsidy benefits they received, with the aggravating factor that these transfers in per capita terms were relatively low and were not always directed to the most disadvantaged. Similarly, for Uruguay and Argentina, Bucheli et al. (2014) and Lustig and Pessino (2014) respectively found that direct taxes and cash transfers combined significantly reduced inequality. However, the application of incidence analysis in other countries in the region showed results in the opposite direction. Specifically, Scott (2014) noted that the small share of resources allocated to direct transfers, coupled with an unproductive tax system, significantly reduced redistributive effectiveness in Mexico. For Peru, Jaramillo (2014) obtained similar results, with the exception of the impact of cash transfers in rural areas. Finally, in the case of Bolivia, Arauco et al. (2014) found that the low redistributive

impact in spite of increasing social spending was in part due to significant leakages in transfers to the nonpoor and to the small size of per beneficiary transfers.

In general, the evidence found for Latin American countries shows that the greatest relative redistributive impacts tend to occur through in-kind transfers (Goñi et al., 2011), particularly transfers in education and health, as pointed out by Lustig et al. (2014). In this sense, Brezzi and de Mello (2016), Coady and Dizioli (2018), and Gasparini and Lustig (2011) also found significant evidence that education expansion was inequality reducing.

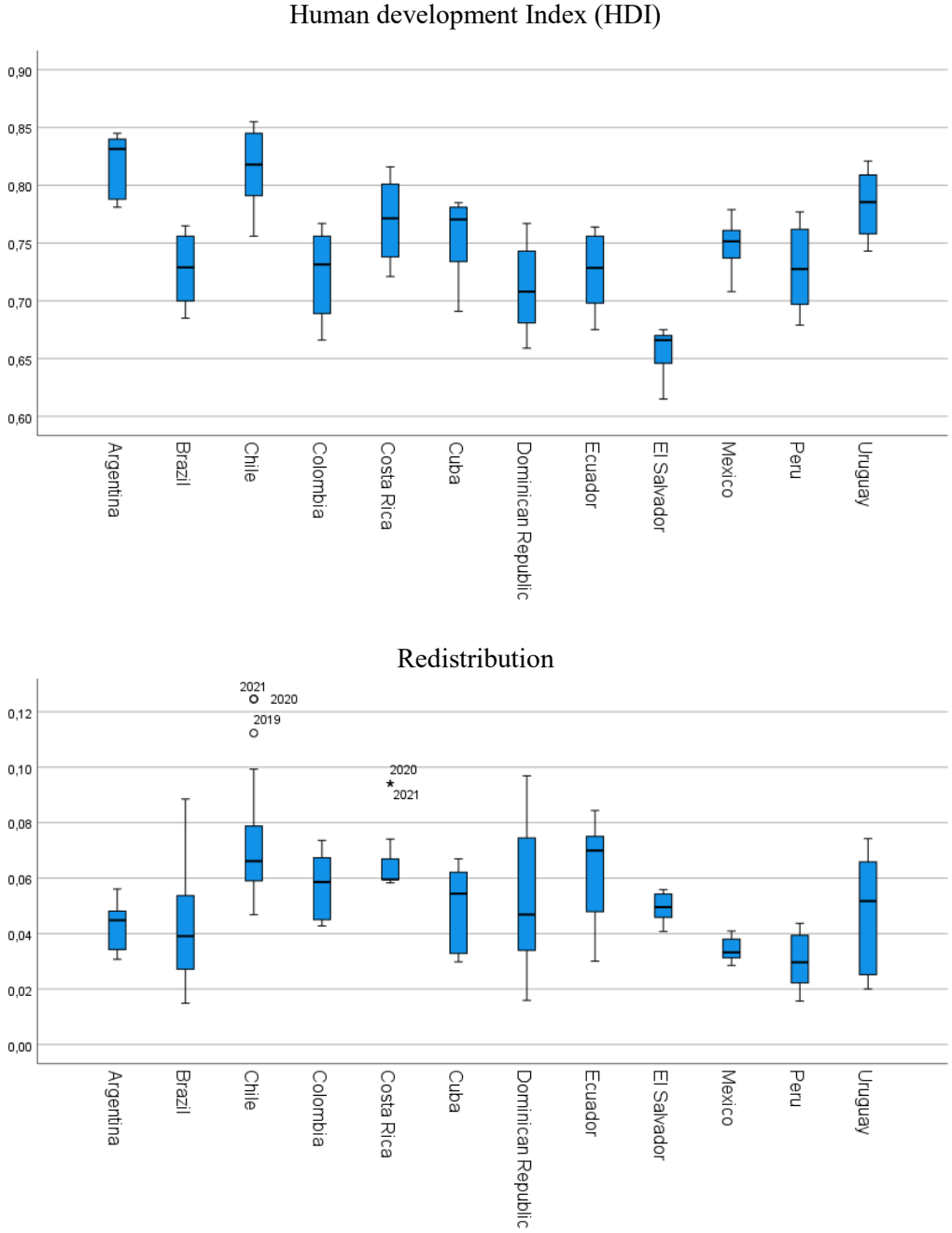
However, at the applied level, the intertwined relationship between redistribution and development, together with its different dimensions and the diversity of ways of approximating both phenomena, means that the direct impact that taxes and transfers exert on development and its different components remains an open question. The main objective of this study is to fill this gap by assessing the redistributive impact of taxes and transfers on human development in Latin America, which ranks amongst the most unequal regions of the world (Brezzi, 2016; Caminada et al., 2019; Cord et al., 2016). The present work aims to contribute to this debate by taking advantage of alternative modeling techniques that allow an exploration of this nexus throughout the distribution. Given the complex interaction between the two variables, and the lack of a theoretical framework linking them, quantile analysis seems appropriate, especially when the heterogeneity between the countries analyzed can give rise to unequal variations in development for different ranges of redistribution.

3. Data

With the aim of obtaining a homogeneous measure of redistribution, we calculated the difference between inequality in primary or market income (i.e., before taxes and government transfers, except pensions and unemployment insurance among adults) and inequality in disposable income (i.e., after taxes and transfers), both measured through the Gini index, obtained from the WID dataset. See Chancel et al. (2022) for a detailed description of the data. Development was measured using the Human Development Index (HDI), which is a composite indicator of life expectancy, education—expected years of schooling—and gross national income (GNI) per capita.

Using time series for the period between 2000 and 2021, we constructed a panel for the 12 Latin American countries for which there was available information. Figure 1 provides a graphical analysis of the distribution of both variables, while Table 1 presents the average values of both variables during the sample period.

Figure 1. Box-plots – Human development and redistribution (2000–2021)



Note: Redistribution is computed as the difference of the Gini index before and after taxes and transfers.

Table 1. Average HDI and redistribution (2000–2021)

Countries	HDI	Redistribution	Countries	HDI	Redistribution
Argentina	0.820	0.043	Dominican Rep.	0.711	0.052
Brazil	0.729	0.042	Ecuador	0.725	0.063
Chile	0.814	0.073	El Salvador	0.656	0.050
Colombia	0.723	0.057	Mexico	0.749	0.034
Costa Rica	0.771	0.065	Peru	0.729	0.030
Cuba	0.756	0.050	Uruguay	0.783	0.047

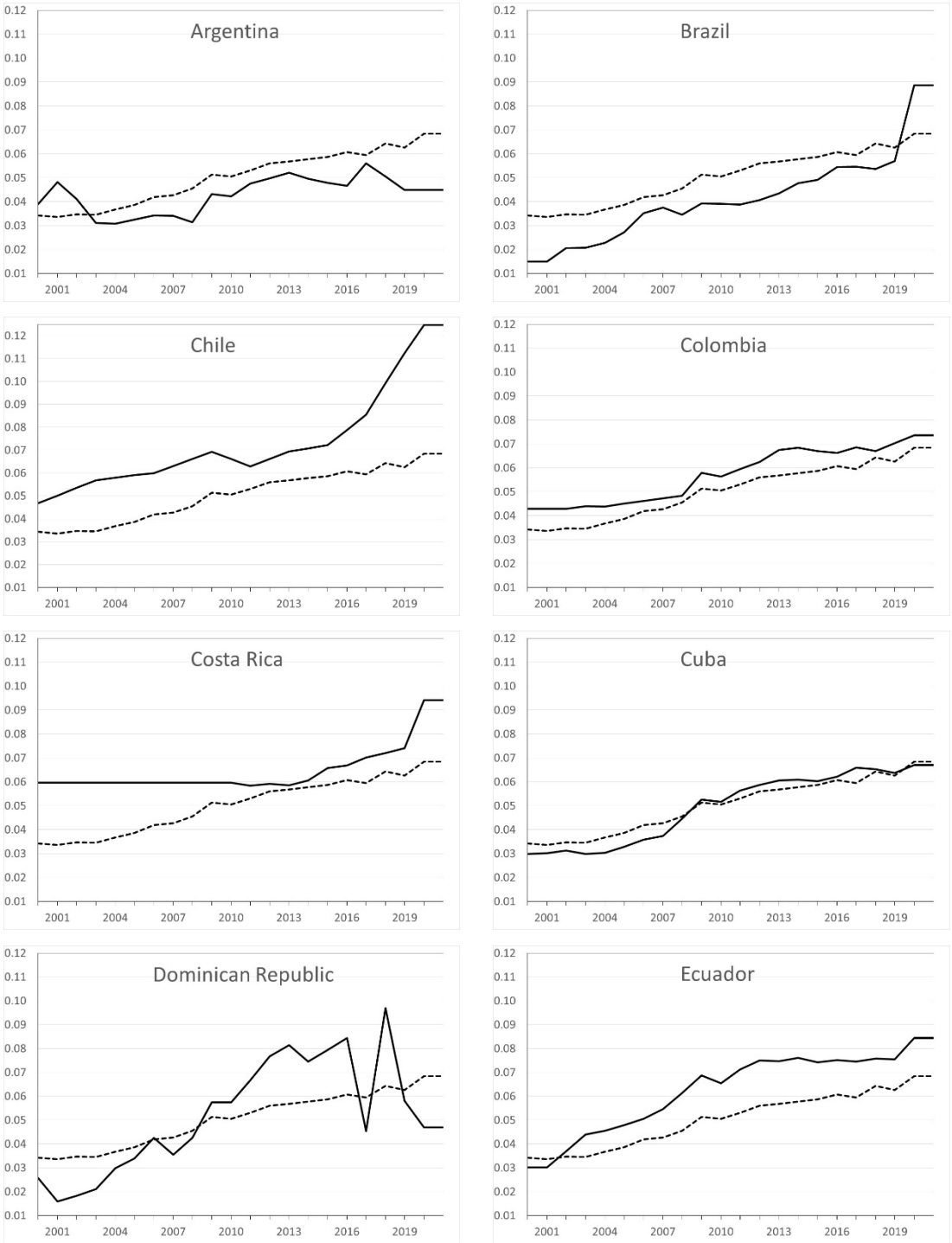
Notes: Rep. denotes Republic. Redistribution is computed as the difference of the Gini index before and after taxes and transfers.

Table 1 shows that Chile, Costa Rica and Ecuador are the countries that present the highest average values of redistribution. On the contrary, Peru and Mexico are the economies with the lowest redistribution mean values. The case of Mexico draws particular attention, since not only is it the only country in which redistribution did not increase during the sample period analyzed but also since 2014, it has shown a decreasing trend, increasing the gap with respect to the aggregate evolution. In this sense, Chancel et al. (2022) noted that Mexico, as opposed to other economies, did not experience a notable reduction in inequality during the 20th century. See Alvaredo et al. (2018) for an assessment of the history of income distribution in Argentina, and Parro and Reyes (2017) for an analysis of income inequality in Chile from 1990 to 2011. Ravallion (2014) warned that the general decline between developing countries hides a slow rise in average inequality within these economies, threatening to stall future progress against poverty by attenuating growth prospects.

Regarding human development, Argentina and Chile present the highest average values for the HDI, while El Salvador is the country with the lowest HDI mean value. It is notable that the United Nations defines an HDI score greater than 0.80 as "very high human development," and only Argentina and Chile fall above this threshold. The box-plots in the first graph of Figure 1 attest to this result. The lower graph indicates that Brazil, the Dominican Republic and Uruguay show the greatest dispersion in terms of redistributive effort, contrasting with countries such as El Salvador and Argentina, with fairly stable levels of redistribution during the period analyzed.

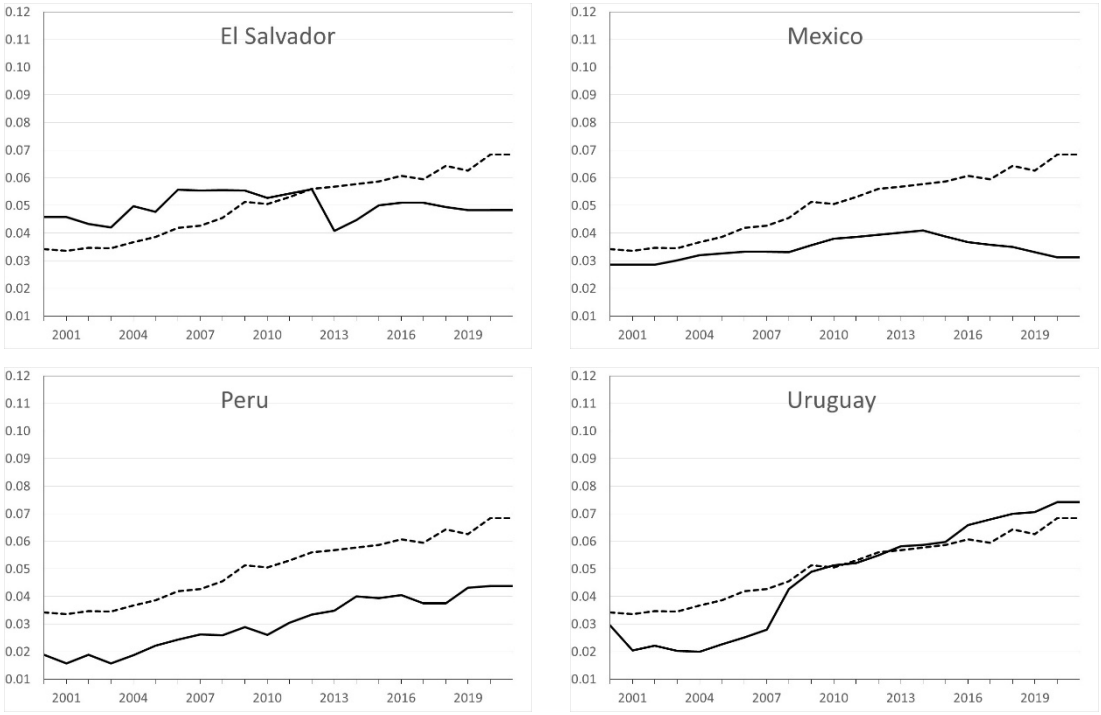
Figure 2 compares the evolution of redistributive efforts at the national level with the average of the countries under study. It is worth highlighting that, from 2019 onward in Argentina and starting in 2017 in Chile, a notable increase in public redistributive efforts can be observed, which coincides in both cases with changes of government.

Figure 2. Evolution of redistribution by country (2000–2021)



Notes: The dotted line represents the evolution of average redistribution, and the black line the evolution of redistribution in each country. Redistribution is computed as the difference of the Gini index before and after taxes and transfers.

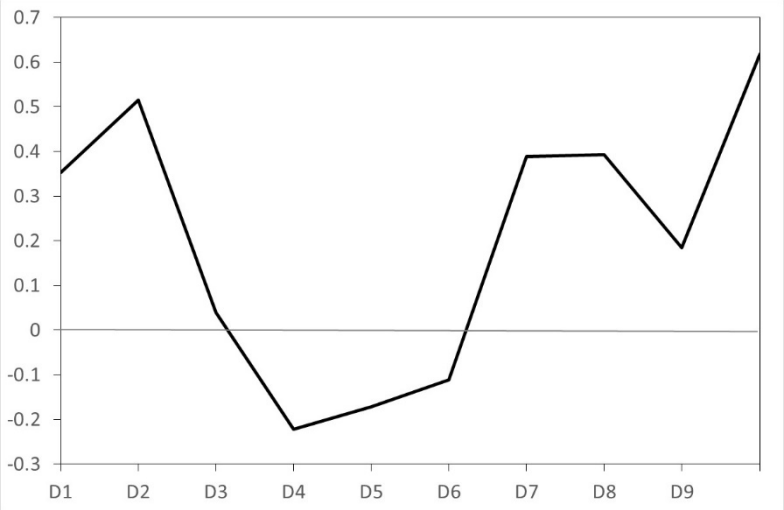
***Figure 2** (cont.).* Evolution of redistribution by country (2000–2021)



Notes: The dotted line represents the evolution of average redistribution, and the black line the evolution of redistribution in each country. Redistribution is computed as the difference of the Gini index before and after taxes and transfers.

Finally, to motivate further the quantile analysis undertaken in the next section, in Figure 3 we present the estimated correlation coefficient for each decile of the distribution (D1 to D9). The graph shows how the correlation varies widely between the central range of the distribution and the tails, not only in intensity but also in sign. Specifically, the highest correlations are apparent in the first and last deciles of the distribution, with a positive sign. On the contrary, in the center of the distribution, the intensity of the association decreases considerably, taking on a negative sign in the three central deciles (D4, D5 and D6).

Figure 3. Correlation coefficient by deciles – Redistribution and development



Notes: The black line represents the correlation coefficient between redistribution and human development for each decile of the distribution (D1,…, D9).

4. Empirical analysis

The relationship between redistribution and human development over time is examined by means of quantile regression. This approach allows an evaluation of the contribution of redistributive measures to development and its components across quantiles. Voitchovsky (2005) stressed the different results observed in the relationship of inequality and growth at the bottom end and the top end of the distribution. Whereas OLS estimates the conditional mean of the response variable across values of the predictor variables, quantile regression estimates the conditional median or other quantiles of the response variable. This approach provides a systematic methodology for examining how covariates influence the scale and shape of the entire response distribution.

Another advantage of quantile regression relative to ordinary least squares regression is that quantile regression estimates are more robust to outliers in the response measurements. By focusing on conditional quantile functions, quantile regression can be used to analyze the relationship between variables more comprehensively, helping to uncover links between variables in cases in which there is no clear relationship or only a weak relationship between the means of the variables under study. The complexity of interactions between redistribution and development and its different components may lead to unequal variations of development for different ranges of redistribution. See Angrist and Pischke (2009), Koenker (2005) and Yu et al. (2003) for a comprehensive discussion on quantile regression and its applications.

The τ^{th} quantile of a random variable Y with cumulative distribution function $F_Y(y) \geq P(Y \leq y)$ can be expressed as

$$q_Y(\tau) = F_Y^{-1}(\tau) = inf\{y: F_Y(y) \geq \tau\}, \quad \text{where } \tau \in (0,1) \tag{1}$$

In quantile regression, for the τ^{th} quantile, it is assumed that the τ^{th} conditional quantile is given as a linear function of the explanatory variables (X):

$$Q_{Y|X}(\tau) = X\beta_\tau \tag{2}$$

Therefore, quantiles can be expressed as the solution of a minimization problem. Given the distribution function of Y, β_τ can be obtained by solving:

$$\hat{\beta}_\tau = \min_{\beta \in R^k} \{E[\rho_\tau(Y_i - X_i'\beta)]\}, \tag{3}$$

where ρ_τ denotes the loss function. In our particular case, given dependent variable y_i (HDI and each of its components) and the explanatory variable x_i (redistribution), to obtain the quantile estimator the minimization problem can be reformulated as the following linear programming problem:

$$\min_{\beta \in R^k} \left[\sum_{i \in \{i: y_i \geq x_i'\beta\}} \tau |y_i - x_i'\beta| + \sum_{i \in \{i: y_i < x_i'\beta\}} (1-\tau)|y_i - x_i'\beta|\right] \tag{4}$$

Note than when τ is equal to 0.5, the loss function ρ_τ is proportional to the absolute value function, and thus median regression is the same linear regression by least absolute deviations. The obtained coefficients of quantile estimates are presented in Table 2.

Table 2 reports the results of the quantile estimates. Column (1) shows the estimated coefficients for the specification that considers the HDI as the dependent variable, while columns (2) to (4) respectively report the estimated coefficients for the rest of the components of the HDI: the life expectancy index, which captures the health dimension; the expected years of schooling, which are used as a proxy for the education dimension and human capital; and income per capita. Results in column (1) suggest that increases in redistribution are associated with an increase in the level of development. This finding is in line with the results obtained by Claveria (2024) for Europe and Karakotsios et al. (2020) for a panel of 58 countries. By means of incidence analysis, Goñi et al. (2011) and Lustig et al. (2014) also found evidence regarding the redistributive role of progressive taxes and transfers in Latin America.

Table 2. Quantile regression results – Redistribution and development and its components

	(1)	(2)	(3)	(4)
Dependent variable	HDI	Life expectancy index	Expected years of schooling	GNI per capita
Redistribution τ				
0.1	0.012***	0.001	0.460***	0.004
	(0.001)	(0.001)	(0.001)	(0.018)
0.2	0.017***	0.001	0.460***	0.007
	(0.002)	(0.001)	(0.039)	(0.013)
0.3	0.018***	0.002	0.459***	0.006
	(0.001)	(0.002)	(0.036)	(0.012)
0.4	0.017***	0.002	0.447***	0.016
	(0.001)	(0.002)	(0.021)	(0.016)
0.5	0.016***	0.003	0.444***	0.011
	(0.001)	(0.002)	(0.022)	(0.015)
0.6	0.016***	0.002	0.451***	0.029**
	(0.001)	(0.002)	(0.022)	(0.012)
0.7	0.016***	0.001	0.427***	0.034***
	(0.001)	(0.002)	(0.027)	(0.009)
0.8	0.015***	0.001	0.399***	0.027***
	(0.001)	(0.002)	(0.026)	(0.008)
0.9	0.012***	0.002**	0.332***	0.014
	(0.001)	(0.001)	(0.032)	(0.009)

Notes: Robust (sandwich) standard errors between brackets. Column (1) reports quantile estimates for Human Development Index (HDI). Columns (2) to (5) report quantile estimates for each of the components of the HDI. GNI denotes Gross National Income and it is included in the model in logs. Each file contains the coefficients of quantile estimates regression for the 10, 20, 30, 40, 50, 60, 70, 80 and 90 percent quantiles of redistribution (τ), calculated as the difference between market and net Gini index.

* Indicate statistical significance at the 10% level.

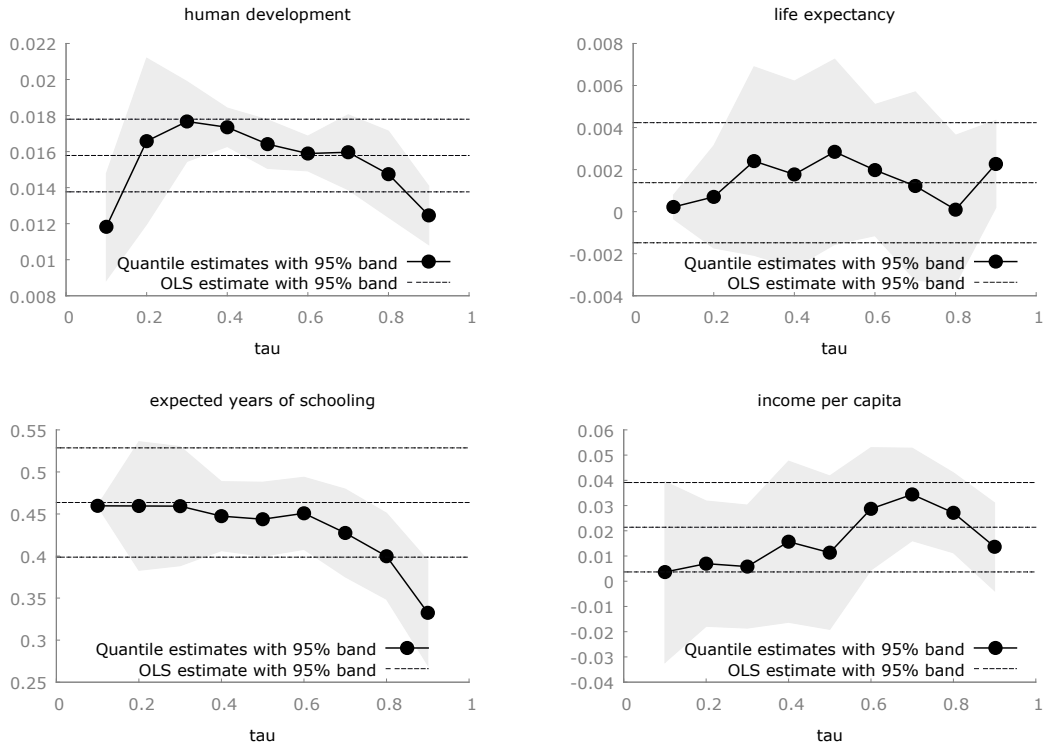
** Indicate statistical significance at the 5% level.

*** Indicate statistical significance at the 1% level.

When re-estimating the regressions for the different components of the HDI, we also found a positive association between redistribution and the rest of the components. This link is particularly significant for the expected years of schooling, which is the variable capturing the education dimension of development, and is usually used to proxy human capital. Székely and Mendoza (2017) showed that distributional improvements in income inequality in Latin America were associated with education. Also, for Latin America Lustig et al. (2014) showed that in-kind transfers in education and health had a greater role in reducing inequality than cash transfers. Simiarly, Coady and Dizioli (2018) also found a positive and significant relationship between income inequality and average years of schooling, which indicates that subsidizing education may be inequality reducing.

In the case of the health component (life expectancy index), the only significant coefficients are obtained for the highest values of the distribution. Likewise, in the case of the economic component, approximated by per capita income, the redistribution coefficients are significant in the second half of the distribution. Alesina and Rodrik (1994) and Perotti (1996) also found a positive association between redistribution and economic growth, while Ostry et al. (2014) and Thewissen (2014) obtained a weak effect of redistribution. Figure 4 shows the evolution of the coefficient on redistribution across quantiles, both for HDI and its components.

Figure 4. Coefficients on redistribution across the distribution



Notes: Black line represents quantile estimates with a 95% band. Horizontal dotted lines represent OLS estimate with 95% band. Y-axis represents coefficient estimates, X-axis represents τ values, corresponding to the 10, 20, 30, 40, 50, 60, 70, 80 and 90 percent quantiles of redistribution.

With the aim of evaluating the robustness of the results to different specifications, all four models are re-estimated by introducing a set of N-1 dummy variables multiplied by their respective regression coefficients to account for unobserved time-invariant country-specific characteristics, as well as T-1 dummy variables to account for time fixed effects, allowing us to control for time-varying differences common to all countries (e.g., the 2008 financial crisis). All the models were estimated using heteroskedasticity- and autocorrelation-consistent (HAC) standard errors. Table 3 reports the obtained results.

Table 3. Quantile regression results with time and country dummies – Redistribution and development and its components

	(1)	(2)	(3)	(4)
Dependent variable	HDI	Life expectancy index	Expected years of schooling	GNI per capita
Redistribution τ				
0.1	0.003***	0.001***	0.022	0.018**
	(0.001)	(0.001)	(0.031)	(0.009)
0.2	0.003***	0.001	0.059*	0.013
	(0.001)	(0.001)	(0.032)	(0.009)
0.3	0.003***	0.002	0.074**	0.008
	(0.000)	(0.002)	(0.033)	(0.007)
0.4	0.003***	0.002	0.024	0.008
	(0.000)	(0.002)	(0.017)	(0.011)
0.5	0.002***	0.001	0.061**	0.016***
	(0.001)	(0.002)	(0.030)	(0.006)
0.6	0.002**	-0.001	0.057***	0.017
	(0.001)	(0.002)	(0.021)	(0.014)
0.7	0.002**	0.003	0.020	0.011
	(0.001)	(0.003)	(0.037)	(0.014)
0.8	0.001	0.003	0.006	-0.005
	(0.001)	(0.002)	(0.021)	(0.016)
0.9	-0.001	0.005**	0.024***	0.007
	(0.001)	(0.002)	(0.006)	(0.015)

Notes: All models are estimated with *N*-1 country dummies and T-1 dummy variables to account for both country and time fixed effects. Models are estimated using robust (sandwich) standard errors, included between brackets. Column (1) reports quantile estimates for HDI. Columns (2) to (4) report quantile estimates for each of the components of the HDI. GNI denotes Gross National Income and it is included in the model in logs. Each file contains the coefficients of quantile estimates regression for the 10, 20, 30, 40, 50, 60, 70, 80 and 90 percent quantiles of redistribution (τ), calculated as the difference between market and net Gini index.

* Indicate statistical significance at the 10% level.

** Indicate statistical significance at the 5% level.

*** Indicate statistical significance at the 1% level.

Overall, results reported in Table 3 are very similar to those presented in Table 2. Again, in all cases, the estimated parameters are positive. However, when accounting for unobserved time-invariant country-specific characteristics and controlling for time-varying differences common to all countries, the strength of the relationship between redistribution and development seems to decline for the highest values of the distribution. In the case of expected years of schooling, the intensity of the association slightly greater around the centre of the distribution. Finally, the impact of redistribution on income per capita is only significant for the central decile ($\tau = 0.5$).

The coefficients of the dummy variables are mostly significant for all quantiles in all specifications, although they have not been reported here for clarity. These national differences in the effect of redistribution on development and its components somehow connect with recent research by Amarante et al. (2016), who found that reductions in inequality in Latin America were mainly explained by reductions within each country in the region, suggesting that internal dynamics where more relevant than those between them. Similarly, Baek et al. (2023) showed that regional factors have heterogeneous effects on income inequality fluctuations across countries, and that they account more significantly for the future variance of income inequality than for global factors.

Overall, the results obtained reveal the existence of a positive and significant relationship between redistribution and human development in Latin America. Of the three components of development analyzed—income, health and education—, it is precisely the latter (expected years of schooling) that is most affected by the redistributive effect of taxes and transfers.

5. Conclusion

This study evaluates the relationship between redistributive measures and development in Latin American countries. The analysis examines this link across quantiles to shed some light on the evolution of the relationship throughout the distribution. To this end, quantile regression is applied for each component—health, education and income—and for human development.

Overall, it is found that increased redistribution is associated with increased human development across the distribution. This finding is robust to the inclusion of time- and country-fixed effects. When evaluating the redistributive role of taxes and transfers in the different dimensions of development, a positive association is obtained in all cases, although its significance differs. Redistribution shows a positive and significant relationship with years of schooling throughout the distribution. For the other two components the nexus is only significant for the central quantiles in the case of life expectancy, and for the second half of the distribution in the case of per capita income.

The results obtained suggest the existence of a positive association between redistribution and development. This link between increases in government spending is fundamentally manifested in a rise in the expected years of schooling. These findings are

of special interest for the design of fiscal policies. In this regard, to achieve a greater reflection of redistributive efforts in promoting economic and human development, it is not enough simply to increase the proportion of social spending: it is necessary to ensure the efficiency of these measures, fundamentally by ensuring progressivity in taxes and an adequate selection of transfer recipients.

While the study focuses on the different quantiles of the distribution instead of concentrating on the average, the analysis is subject to some caveats. First, due to the length of the series, the study neglects intertemporal issues. Second, because of the data limitations, the analysis considers the effect of taxes and transfers simultaneously, without differentiating between the two measures of fiscal policy or between cash and in-kind transfers. Finally, we want to note that the results obtained might have been influenced by biases derived both from the measurement of redistribution and from the fact that other factors affecting human development have not been considered, as well as from the size of the sample. As time series related to disposable income after taxes become available for additional countries, the objective is to expand the analysis to other regions of the world.

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