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# Fiscal Policy, Income Redistribution, and Poverty Reduction in Latin America[1]

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**Abstract**

This paper uses standard fiscal incidence analysis to study how much income redistribution and poverty reduction are accomplished through the fiscal system in eighteen Latin American and Caribbean (LAC) countries. We show there is considerable heterogeneity in the income inequality and poverty-reducing power of LAC fiscal systems. While all LAC fiscal systems reduce income inequality, fiscal systems in nine LAC countries are poverty-increasing, and this startling characteristic has not improved over time. When analyzing specific fiscal elements, we find that direct taxes, direct transfers, and in-kind transfers are all equalizing, and spending on education and health is often pro-poor. Moreover, contrary to expectations, indirect taxes and subsidies are more frequently equalizing than unequalizing.

Key words: Fiscal policy, inequality, poverty, Latin America
JEL codes: D31, D6, E62, H22, I32

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## 1. Introduction

Taxation and government spending are key policy levers the state has in its power to change the distribution of income determined by the prevailing distribution of wealth, market forces, and institutions. Thus, knowing how much income redistribution and poverty reduction are accomplished through the fiscal system is essential. The standard approach used in the literature is fiscal incidence analysis. In this paper, we analyze the impact of fiscal policy on inequality and poverty in eighteen Latin American and Caribbean countries. The year of the fiscal incidence analysis varies by country but falls within the 2009-2019 range. The studies used here apply the same fiscal incidence methodology described in detail in Lustig (2022) and, thus, are comparable.[2] Because these studies were carried out with a common approach developed by the Commitment to Equity (CEQ) Institute at Tulane University, they are called Commitment to Equity (CEQ) Assessments.[3] We also use data from CEQ Assessments for forty non-LAC countries housed in the CEQ Data Center on Fiscal Redistribution to compare LAC estimates of fiscal redistribution on a global scale, focusing on non-LAC upper-middle-income countries.

In this paper, we address the following three questions: How much income redistribution and poverty reduction are being accomplished through fiscal systems in LAC? How equalizing (inequality-decreasing) and pro-poor (per capita spending falls as prefiscal income rises) are specific taxes and government spending?[4]

We show that a key feature of the LAC region is the considerable heterogeneity of prefiscal income inequality across countries and that such heterogeneity also extends to the power of fiscal systems to reduce inequality (that is, countries with similar prefiscal income inequality show different levels of inequality reduction). Moreover, the results state that LAC fiscal systems always reduce inequality. However, LAC's inequality reduction is lower than in non-LAC upper-middle-income countries and considerably lower than in advanced countries. An additional analysis of the effect of specific taxes and transfers on inequality confirms that, on average, direct taxes, direct transfers, and spending on education and health are always equalizing. Likewise, indirect taxes and subsidies are more frequently equalizing than unequalizing.

On the poverty impact, results show that although LAC fiscal systems always reduce

[2] The studies included in this paper are: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Sauma and Trejos, 2014); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).

[3] Launched first as a project in 2008, the Commitment to Equity Institute (CEQ) at Tulane University was created in 2015 with the generous support of the Bill and Melinda Gates Foundation.

[4] Other studies have explored the redistributive effect of fiscal systems across Latin America, but they either heavily rely on secondary sources, study a limited number of countries across the region, analyze dated systems, or focus on specific fiscal instruments (see, for example, Goñi, López, and Servén, 2011; Lustig, 2017; Jara et al. 2023).

inequality, they do not necessarily reduce poverty. In particular, fiscal policy in nine out of the eighteen LAC countries studied is poverty-increasing, and this startling characteristic, also shown in various non-LAC upper-middle-income countries, has not improved over time.

The paper proceeds as follows. Section 2 presents a brief overview of fiscal incidence analysis. A more detailed description of the theory behind fiscal redistribution is presented in Appendix A. Section 3 describes the data. Section 4 presents the countries' taxes and public spending composition. Sections 5 and 6 show the results of the impact of fiscal policy on income inequality and poverty, respectively. Section 7 attempts to characterize the fiscal systems in the region based on dimensions of the fiscal system and the redistributive effect. Section 8 concludes.

## 2. Fiscal Incidence Analysis[5]

Rooted in the field of Public Finance, fiscal incidence analysis is the most commonly used method to measure the distributional impact of a country's taxes and public spending (Musgrave, 1959; Pechman, 1985; Martinez-Vazquez, 2008). In practice, fiscal incidence analysis is the method followed to allocate taxes and public spending to households so that one can compare prefiscal and postfiscal incomes and the relevant indicators of inequality and poverty.

Standard fiscal incidence analysis looks only at what is paid and what is received without assessing the behavioral responses that taxes and public spending may trigger on individuals or households. This is often referred to as the "accounting" approach. Put simply, the accounting approach consists of starting from an income concept (prefiscal) and allocating the proper amount of a tax or a transfer to each household. More formally, the postfiscal income can be defined as:

$$Y_h = I_h - \sum_i T_i S_{ih} + \sum_j B_j S_{jh}$$

where $Y_h$ is the postfiscal per capita income of household h and $I_h$ is the before taxes and transfers per capita income of household h. $T_i$ refers to taxes (where i refers to the range of taxes whose incidence is being analyzed) and $B_j$ to transfers (where j refers to the range of transfers whose incidence is being analyzed). $S_{ih}$ is the "allocator" of tax i to household h and $S_{jh}$ is the "allocator" of transfer j to household h.

As shown formally in Appendix A, it is important to stress that the relevant equity measure is the net effect of taxes and transfers combined. For instance, value-added taxes (VAT) may be regressive, but they may be desirable from an equity standpoint if the resulting revenues are used to finance primary-school services in poor neighborhoods or cash transfers targeted to the poor. The point here is that analyzing the tax side without the spending side combined (or vice versa) can be awfully misleading.[6]

[5] This section draws from Lustig (2022).

[6] Mathematically, this is shown in Lambert's fundamental equation of redistribution (Lambert, 2001) described in Appendix A.

Although the theory of fiscal incidence analysis is quite straightforward, its application can be fraught with complications. Some of these complications arise because actual or economic incidence can be quite different from statutory incidence (Lustig, 2020). A general principle is that the economic incidence depends on the elasticity of demand and/or supply of a factor or a good: the burden of taxes is borne by those who cannot easily adjust to the change in price induced by the tax. The economic incidence of taxes will also be affected by how revenues are used. In a general equilibrium analysis (which is necessary when taxes impact large parts of the economy), the economic incidence is also sensitive to a large number of elasticities. In open economies, the extent of factor mobility will affect the one on whom the burden of taxes fall. Finally, in a dynamic context, the long run economic incidence will ultimately depend on how taxes affect capital accumulation and marginal productivities of factors of production. Actual incidence can also differ from statutory incidence because, for example, there is tax evasion or informality, or the take up of a transfer program is above or below what is stated by the law. Another source of difficulty is that the data to calculate the actual incidence is usually incomplete or absent.[7]

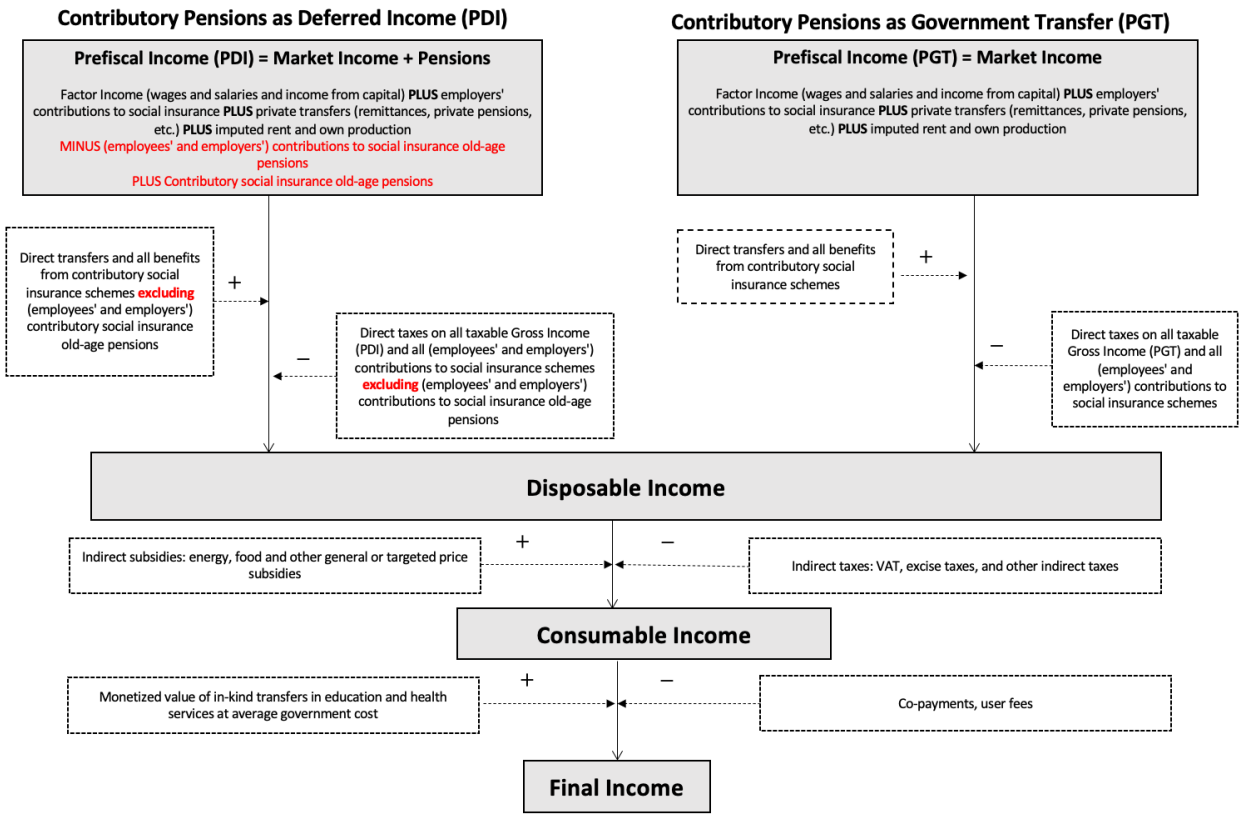
In terms of data, incidence studies use microdata from household surveys combined with budget data from fiscal accounts and other administrative registries. Since, in practice, surveys will not include information on every tax paid or transfer received (or, if the information exists, it may be inaccurate), that information must be generated in a consistent and methodologically sound way. Frequently, the information will have to be generated using a variety of assumptions to check the sensitivity of the results to assumptions that cannot be externally validated.

**The Incidence Analysis used in CEQ Assessments**

The building block of fiscal incidence analysis is the construction of income concepts. That is, starting from prefiscal income, each new income concept is constructed by adding another element of the fiscal system to the previous one. Figure 1 presents a stylized version of how to construct the four core income concepts in CEQ assessments.[8] There are two definitions of the first –the prefiscal--income concept: Market Income or Market Income plus Pensions depending on the treatment of contributory pensions (more on this below). The next three are Disposable Income, Consumable Income, and Final Income. In broad terms, Disposable Income measures how much income individuals may spend on goods and services. Consumable Income measures how much individuals can actually consume. Final Income includes an imputed value for public services in education and health calculated as the average spending by the government in those services. In essence, this imputation adds the amount of income individuals would need if they would have had to pay for those services at government costs.

[7] See the classic survey by Kotlikoff and Summers (1987), for example.
[8] See Figure 6-2 and Table 6-5 in Lustig (2022) for a detailed definition of the income concepts.

Figure 1 - Income Concepts under the Two Scenarios: Pensions as Deferred Income (PDI) and Pensions as Government Transfer (PGT)




Source: Lustig (2022).

The treatment of contributory pensions is a salient conceptual challenge in static fiscal incidence analysis. Should income from contributory pensions be treated as a government transfer or deferred income and thus added to prefiscal income? Should contributions be treated as a tax or a form of mandatory saving? In the fiscal incidence analysis literature, one can find both approaches: in some cases, contributory pensions are considered deferred or replacement income (Alvaredo et al., 2015; Breceda, Rigolini, and Saavedra, 2008; Immervoll et al., 2009) while in others they are considered a pure government transfer (Goñi, López, and Servén, 2011; Immervoll et al., 2009; Lindert, Skoufias and Shapiro, 2006; Silveira et al., 2011). In the former case, contributions during active years are treated as a form of mandatory saving and, thus, subtracted from prefiscal income to avoid double counting. When pensions are considered a government transfer, contributions are treated as any other direct tax. However, the true situation is likely to be in between the two cases for many individuals.[9] Since contributions to the system during working years can count as mandatory saving, whether an individual receives a transfer depends on the size of the replacement income and her life expectancy.

[9] Indeed, Altamirano, Oliveri, and Bosch (forthcoming) estimate that the average worker in the LAC region receives a subsidy of 28 percentage points in her replacement rate (equivalent to 44 percent of the total pension).

Identifying how much of an old-age pension is a pure transfer and how much is replacement income with cross-section household surveys is very difficult, if not impossible. In many countries, social insurance contributory pensions are partly deferred income and therefore should have a portion of them added to Market Income (and contributions subtracted from factor income); and partly government transfer and therefore a portion of them should be included with the rest of government transfers (and contributions treated as any other direct tax). However, since at this point there is no conventional method to determine which portion should be allocated to prefiscal income and which to government transfers when the only information available is a cross-section household survey, CEQ assessments present results under two scenarios: (1) contributory pensions as a pure deferred income (PDI) and (2) contributory pensions as a pure government transfer (PGT).[10]

The PDI and PGT scenarios describe two cases. Conceptually, the PDI scenario is closest to a social security system with individual (or savings) accounts (as in Chile and Mexico, for example). In such systems, individual contributions are deposited in fully-funded defined-contribution pension programs. The accumulated contributions are capitalized and then used to finance pensions when individuals retire. These systems are commonly known as defined contribution pension schemes. The difference between a defined contributions system and the PDI scenario is that the pension benefits (the replacement income) in the latter may not correspond to the pension that would prevail under an individual accounts system (for the individuals who receive less than the value that would correspond to a defined contributions pension plans). One assumes that they correspond by construction. The PGT scenario corresponds to a defined benefits pension scheme. However, the PGT scenario implicitly treats beneficiaries as the first cohort of an unfunded program perpetually. When an unfunded defined-benefits system is initially established, pension benefits to the first cohort come from net transfers from the cohorts that follow. That is, for the first cohort, pensions are indeed a one-hundred percent pure government transfer. Even if retirees paid contributions into the system in the past, these are not accounted for. These pensions are funded by taxes, and the latter includes the contributions of active formal sector workers in the cross-section. For these individuals, the contributions are subtracted from prefiscal income to obtain income net of taxes.[11]

CEQ assessments attempt to cover a broad spectrum of taxes and government spending. Taxes include personal income and payroll taxes and other direct taxes such as property taxes, and consumption taxes. Spending covers direct cash and near–cash transfers (including school feeding programs and free uniforms and textbooks), indirect subsidies (especially on food, housing, energy, and agricultural inputs), and benefits from public spending on education and health. Spending on public goods such as defense and corporate taxes and subsidies are not included. As a rule,

[10] In chapter 6 of Lustig (2022) Volume 2, Carlos Grushka proposes an approach to determine which scenario may be more appropriate when one has access to cross-section data only.

[11] A third option pursued by some researchers is to treat contributory pensions as a transfer only where the social security system is in deficit. In such cases, the deficit can be allocated as a transfer to individuals in proportion to their pension income, for example. While this approach accounts for the redistribution from taxpayers to pension beneficiaries, the within-system redistribution is ignored.

if taxes and transfers are explicitly available in the surveys, one should use this information unless there are reasons to believe that it is unreliable. However, the information on direct and indirect taxes, transfers in cash and in-kind, and subsidies is often not collected in household surveys. In order to allocate the benefits of transfers and the burden of taxation to individuals included in the household surveys, the studies make use of administrative data on revenues and government expenditures as well as knowledge about how the tax and transfer programs work and allocate these taxes and transfers following the methods described below. Thus, one of the most important aspects of the studies used here is the detailed description of how each component of income is calculated and the methodological assumptions made while calculating it.[12]

The "direct identification method" is the one in which taxes and transfers can be obtained directly from the household survey. When the direct identification method is not feasible, there are several options—namely, inference, imputation, simulation, and prediction.[13] If the primary survey being used does not have the necessary information, these methods can be used in an alternate survey, then benefits or taxes can be matched back into the main survey. As a last resort, one can use secondary sources: for example, incidence or concentration shares by quintiles or deciles that have been calculated by other authors. Finally, if none of these options can be used for a specific category, the analysis for that category will have to be left blank.

One of the biggest challenges in fiscal incidence analysis is how to treat the differences in scale and structure between survey-based values and administrative registries. The causes for these differences are multiple, including differences in definitions, but the causes are most prominently measurement errors due to underreporting of certain income categories (for example, income from capital) and under sampling of the rich in the surveys. Whatever the cause, the overriding principle followed in the studies used here is that—unless there are good reasons not to—the information in the surveys is taken as valid and given precedence over and above the information from administrative registries. However, whenever the team had sufficient evidence to believe that totals in the survey were less credible than those in administrative registries, the latter were used, and the rationale was properly documented.

The fiscal incidence analysis used in CEQ assessments is subject to several caveats. It is point-in-time and does not incorporate behavioral or general equilibrium effects. That is, no claim is made that the prefiscal equals the true counterfactual income in the absence of taxes and transfers. The analysis is a first-order approximation that measures the average incidence of fiscal interventions (and in various settings a first-order approximation is all one may need).[14] Despite being a

[12] See Table B3 in the Appendix for details on the allocation methods used to calculate each one of the fiscal policy instruments analyzed in the CEQ Assessments used here.
[13] See chapter 6 in Lustig (2022) for a detailed description of these methods.
[14] Coady and others, for instance, state, "The first order estimate is much easier to calculate, provides a bound on the real-income effect, and is likely to closely approximate a more sophisticated estimate. Finally, since one expects that short-run substitution elasticities are smaller than long-run elasticities, the first-order estimate will be a better approximation of the short-run welfare impact" (Coady et al., 2006, p. 9).

standard incidence analysis that does not incorporate second-round or general equilibrium effects, the analysis is not a mechanically applied accounting exercise. Moreover, the incidence of taxes is economic rather than statutory. For instance, it is assumed that individual income taxes and contributions are borne by labor in the formal sector and that consumption taxes are fully shifted forward to consumers taking into account the lower incidence associated with the consumption of own-production and tax avoidance/evasion due to informality or other reasons.

Even though the studies used here do not model behavioral, lifecycle, or general equilibrium effects, the method and resulting studies are among the most comprehensive and comparable tax-benefit incidence analyses available for LAC countries to date.

## 3. Data

We use data from eighteen Latin American and Caribbean countries and forty non-LAC developing and developed countries that are presented as comparators. The data utilized is based on the CEQ Assessments available in the Commitment to Equity (CEQ) Institute's Data Center on Fiscal Redistribution.[15] The studies are based on household surveys and administrative data for 2009-2019, depending on the country.[16] The household surveys use income as the welfare indicator. As explained earlier, given that contributory pensions are part deferred income and part government transfer, results were calculated under both the PDI and the PGT scenarios. For comparisons with fiscal redistribution in the European Union, we use EUROMOD's database (EUROMOD, 2017). Since EUROMOD covers only direct taxes, contributions to social security, and direct transfers, the comparison can be made for the redistributive effect from prefiscal to disposable income only. Moreover, since EUROMOD does not report poverty indicators, such a comparison is not possible.

We also use administrative data reported in CEQ assessments in the analysis. The administrative data in CEQ Assessments was captured by authors from multiple sources, including countries' statistical offices and the World Bank's Development Indicator Database. The source of the administrative data is reported in each individual study (see Tables B1 and B2 in Appendix B).

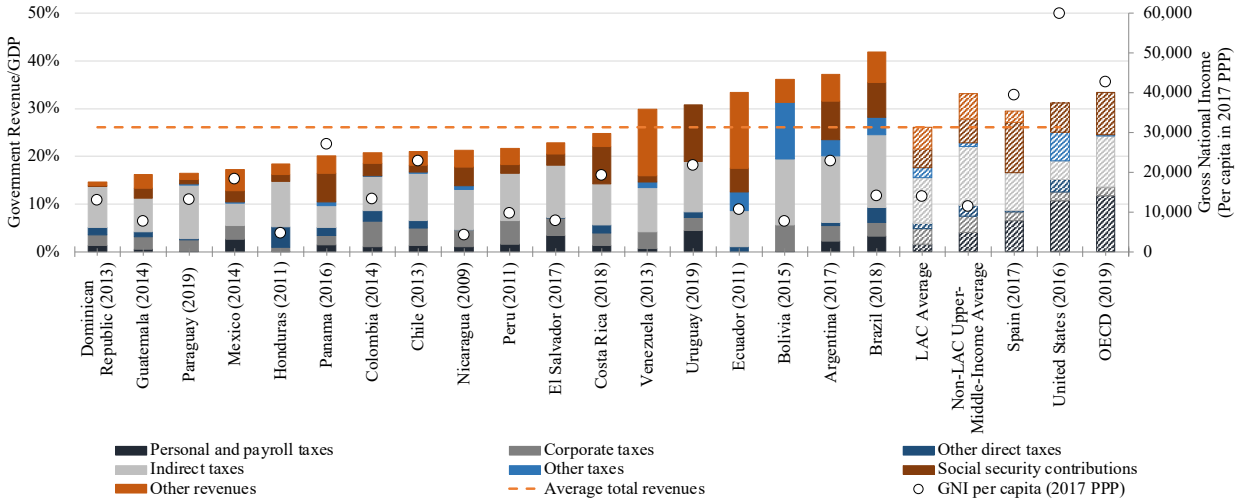
Our analysis uses household surveys from different years depending on the country. In some cases, the analysis is based on a survey dated over ten years ago and in others the survey may be much more recent. This introduces an important caveat which may be truer the farther away in the past the survey year is. It is possible that the fiscal system underwent some fundamental changes in the following years such as a tax reform, elimination of subsidies, or the replacement of targeted by universal transfers. In other words, results in some countries may not be capturing their whole current redistributive reality.

[15] The assessments for Brazil, Costa Rica, Paraguay, and Uruguay for circa 2019 are part of a collaborative effort of the CEQ Institute and the Fiscal Management Division (IFD/FMM) of the Inter-American Development Bank.
[16] See details of the household surveys and sources in Tables B1 and B2 in Appendix B.

## 4. Taxes and Public Spending: Levels and Composition

Figure 2 shows government revenues as a share of GDP. The revenue collection patterns are very heterogeneous in the region. The largest share equals 41.9 percent in Brazil and the smallest is 14.6 percent in the Dominican Republic. In other words, the size of the state varies greatly. LAC's average government revenues as a share of GDP is lower than in non-LAC developed and developing countries. In general, indirect taxes are the region's largest component of government revenues (as a share of GDP). On average, direct and indirect taxes as a share of GDP equal 6.1 percent and 9.5 percent, respectively. Direct taxes as a share of GDP are significantly higher in the comparator group of non-LAC upper-middle-income countries and developed countries.

Figure 2 - Size and Composition of Government Revenues (as a % of GDP)



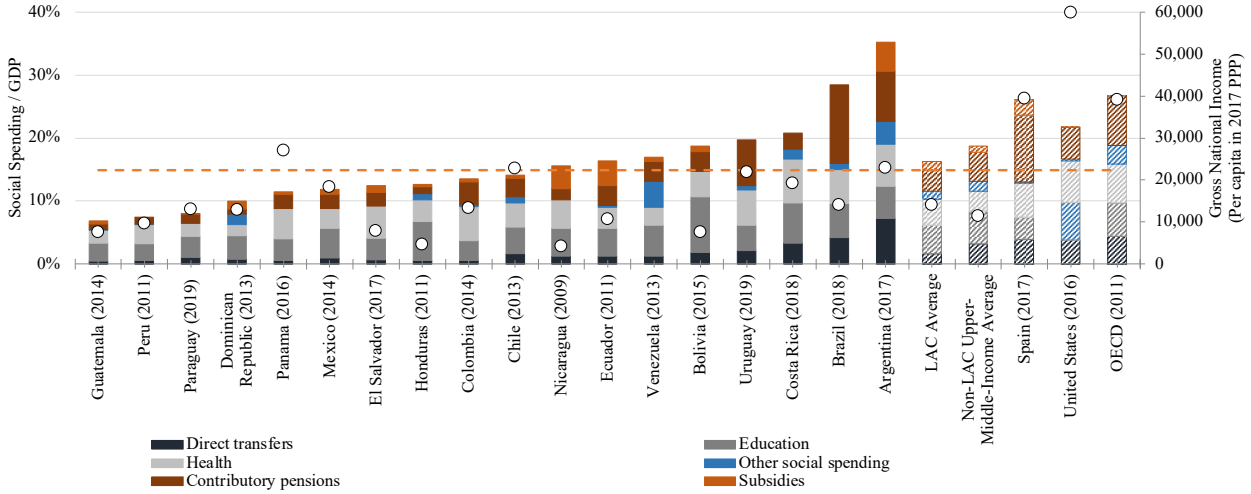

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); Venezuela (Molina, 2020), OECD.Stat, and World Development Indicators. See Table B2 in Appendix B for the source of non-LAC countries.

Notes: The year for which the analysis was conducted is in parenthesis. The dotted line is the average for the LAC countries. The group of non-LAC upper-middle-income countries includes Albania, Armenia, Belarus, Botswana, China, Georgia, Jordan, Namibia, Russia, and South Africa.

Figure 3 shows the level and composition of social spending and subsidies. Social spending includes the following categories: direct transfers, education, health, other social spending, and contributory pensions. On average, excluding contributory pensions, LAC and non-LAC upper-middle-income countries analyzed here allocate 11.5 and 13.1 percent of GDP to social spending, while the advanced countries in the OECD group allocate 18.8 percent of GDP (with Spain and the USA allocating 13.0 and 16.7 percent, respectively). As with revenues, there is great heterogeneity in the resources allocated to social spending within LAC, ranging from 22.7 percent of

GDP in Argentina to 5.5 percent in Guatemala.

Figure 3 - Size and Composition of Social Spending and Subsidies (as a % of GDP)




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); Venezuela (Molina, 2020), World Development Indicators. See Table B2 in Appendix B for the source of non-LAC countries.

Notes: The year for which the analysis was conducted is in parenthesis. The dotted line is the average for the LAC countries. The group of upper-middle-income countries includes Albania, Armenia, Belarus, Botswana, China, Georgia, Jordan, Namibia, Russia, and South Africa. The OECD average includes only advanced countries and was directly provided by the statistical office of the organization. Other social spending includes expenditures on housing and community amenities, environmental protection, and recreation, culture, and religion.

LAC countries on average spend 1.7 percent of GDP on direct transfers, 4.5 percent on education, and 4.1 percent on health. The largest difference between the LAC and non-LAC upper-middle-income countries occurs in direct transfers: the latter spend 3.2 percent. The difference is largely driven by Georgia and Russia. Without the latter, however, the comparator countries still spend more: 2.4 percent. The advanced OECD countries spend on average 4.4 percent of GDP on direct transfers, 5.3 percent on education, and 6.2 percent on health. Regarding spending on contributory pensions, LAC countries spend 3.3 percent of their GDP and non-LAC upper-middle-income countries allocate a slightly larger share of their resources to contributory pensions (4.7 percent). The advanced OECD countries allocate, on average, 7.9 percent.

Given the size of social spending (excluding contributory pensions), Argentina, Brazil, and Costa Rica show the largest amount of resources at their disposal to engage in fiscal redistribution. At the other end of the spectrum are Guatemala, Paraguay, and Peru. However, whether the first group achieves its higher redistributive potential depends on how the burden of taxation and the benefits of social spending are distributed. This shall be discussed below.

## 5. Fiscal Policy and Income Inequality

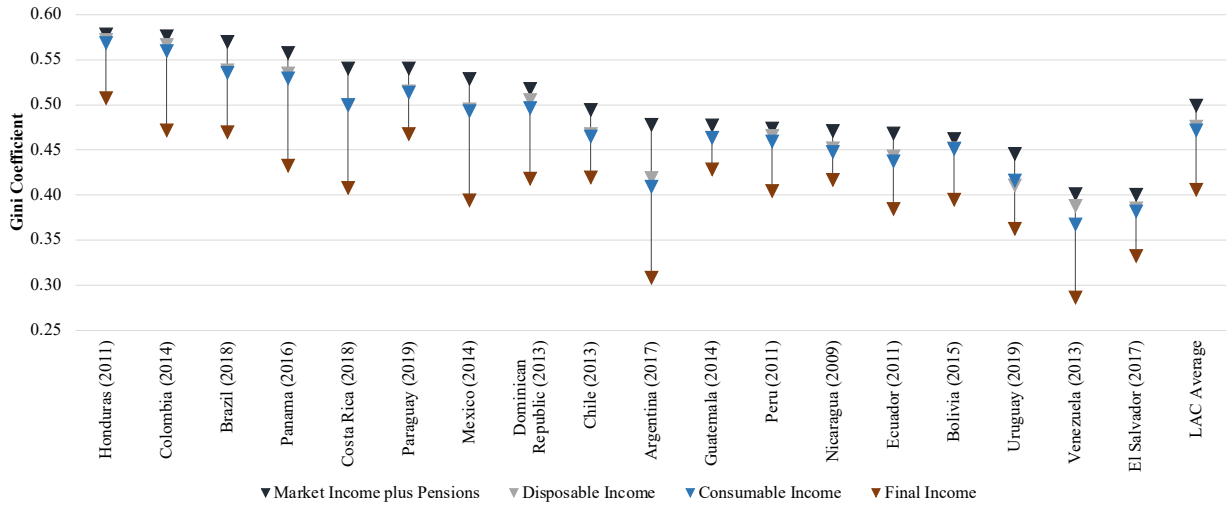
### The Redistributive Impact of the Fiscal System

The impact of fiscal policy on income inequality depends on the size and composition of taxes and transfers, as well as the progressivity of all the taxes and government spending combined (Lambert, 2001). In this section, we present the redistributive impact of fiscal policy on inequality in the set of LAC countries analyzed. A typical indicator of the redistributive effect of fiscal policy on inequality is the difference between the Gini for prefiscal income (Market Income or Market Income plus Pensions, depending on the pensions scenario) and the Gini for income after taxes and transfers, where "after" can refer to just direct taxes and transfers as in Disposable Income, to the latter plus the effect of net indirect taxes as in Consumable Income, and to the latter plus the effect of education and health spending as in Final Income.[17] If inequality is decreasing (increasing), the redistributive effect is positive (negative) and fiscal policy is equalizing (unequalizing).

Figure 4 presents the evolution of the Gini coefficient across the four core income concepts. As already mentioned, given that contributory pensions can be treated as deferred income or as a direct transfer, we present all the calculations for two scenarios: one with contributory pensions included in prefiscal income (Panel A; PDI scenario) and another with them as government transfers (Panel B; PGT scenario).

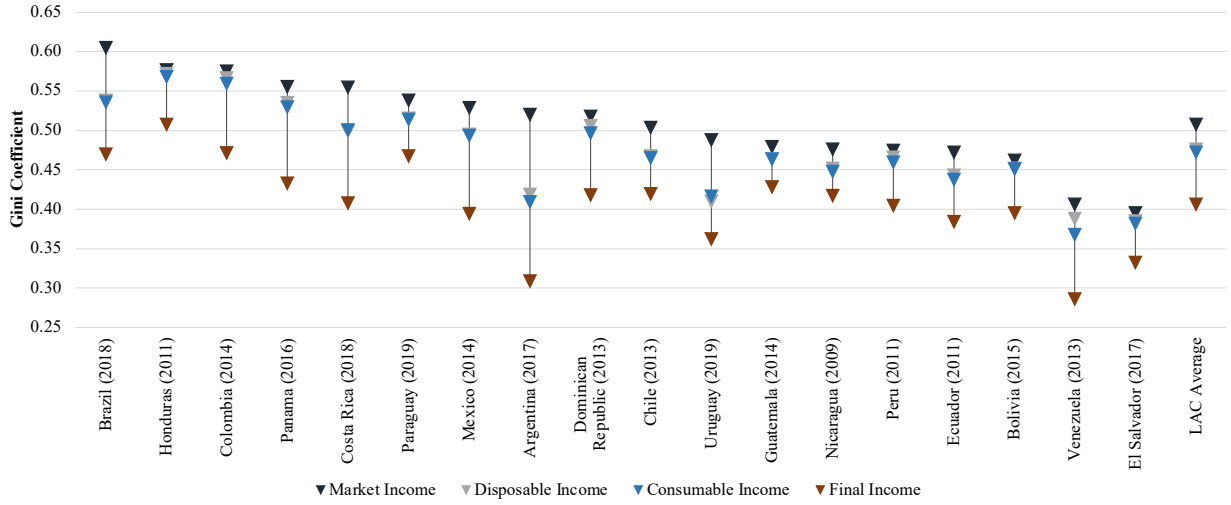
FIGURE 4 - Fiscal Policy and Inequality: Gini Coefficient for Market, Disposable, Consumable, and Final Income

Panel (A) Contributory Pensions as Deferred Income (PDI Scenario)




[17] All the theoretical derivations that link changes in inequality to the progressivity of fiscal interventions have been derived based on the so-called family of S-Gini indicators, of which the Gini coefficient is one case. See, for example, Duclos and Araar (2006). While one can calculate the impact of fiscal policy on inequality using other indicators (and one should), it will not be possible to link them to the progressivity of the interventions.

Panel (B) Contributory Pensions as Government Transfer (PGT Scenario)




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).

Notes: The year for which the analysis was conducted is in parenthesis.

Figure 4 shows that in all cases, the largest change in inequality occurs between Consumable and Final Income. This is not surprising, given that governments spend more on education and health than on direct transfers and subsidies. However, one should be cautious and not make sweeping conclusions from this result because in-kind transfers are valued at average government cost, which is not an exact measure of the "true" value of these services to the individuals who use them (Lustig, 2018).

There is considerable heterogeneity in the region's prefiscal inequality levels and redistributive effect. As can be observed in Figure 4, Brazil, Colombia, and Honduras, show high presfiscal inequality levels (Gini coefficients around 0.57) while El Salvador and Venezuela show lower prefiscal inequality levels (Gini coefficients around 0.4). Likewise, in Bolivia, Guatemala, and Nicaragua, income redistribution is quite limited, while in Argentina, Costa Rica, and Mexico, it is significant. Costa Rica and Mexico are still quite unequal even after redistribution. It is interesting to note that although Argentina, Ecuador, Guatemala, Nicaragua, and Peru start out with similar prefiscal levels of inequality, Argentina reduces inequality considerably, while Ecuador, Guatemala, Nicaragua, and Peru do not. Similarly, Costa Rica, Mexico, Paraguay, and the Dominican Republic start out with similar levels of inequality, but Costa Rica and Mexico reduce inequality by more. However, it is very important to remind ourselves that a larger redistributive effect is not necessarily a "good thing." For instance, in Argentina, the large redistributive effect is not only unsustainable but one of the contributing factors to the country's very high inflation and dismal growth performance.

Comparing Panels A and B reveals that the redistributive effect is considerably larger in Argentina, Brazil, and Uruguay when contributory pensions are treated as a transfer. These are countries with higher social security coverage and an older population. In Chile, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Nicaragua, Peru, and Venezuela, the effect is larger, but only very slightly. Interestingly, in Bolivia, Colombia, El Salvador, Honduras, Mexico, Panama, and Paraguay, the redistributive effect is smaller when contributory pensions are considered a government transfer versus deferred income. That is, in these countries, contributory pensions are unequalizing even in the cross-section analysis.

Fiscal incidence studies for more than one year are available for ten of the eighteen countries (Argentina, Brazil, Colombia, Costa Rica, El Salvador, Guatemala, Mexico, Paraguay, Peru, and Uruguay) and allow us to explore how the redistributive impact of LAC fiscal systems changes over time.[18] The years for which studies are available varies by country but, broadly, they range from 2009 to 2019. Overall, the results suggest that the redistributive effect has not improved over time (see Figure C1 in Appendix C). Of the ten countries, the redistributive effect increases only in Argentina, Costa Rica, Mexico, Paraguay, and Peru, while in the rest, it has no change (Guatemala) or has diminished over time (Brazil, Colombia, El Salvador, and Uruguay). In fact, the latter resulted in Brazil and Uruguay no longer being among the three countries with the largest inequality-reducing effect, as would have been the case had we used the studies for 2009. Moreover, a decomposition exercise following Lustig and Pessino (2014) suggests that, in the countries where the redistributive effect increased over time, the change in the Gini of final income over time is due to a change in redistribution rather than to a change in the Gini of prefiscal income.

How does Latin America compare with the fiscal redistribution that occurs in developed countries? Although the methodology is somewhat different, one obvious comparator is the analysis by EUROMOD for the twenty-eight countries in the European Union (EUROMOD, 2017). As mentioned earlier, given that EUROMOD covers only direct taxes, contributions to social security, and direct transfers, the comparison can be made for the redistributive effect from Market Income plus Pensions (and Market Income) to Disposable Income. A comparison is also made with the United States.

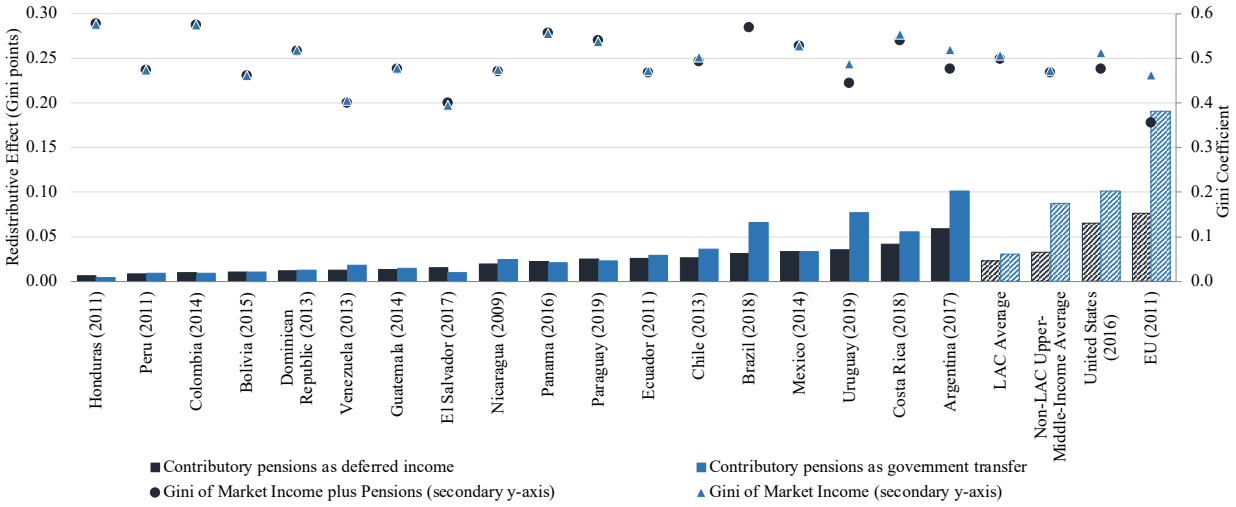
There are three important differences between the EU countries and the eighteen LAC analyzed here. First, as shown in Figure 5, prefiscal inequality is higher for LAC countries. The difference is most striking when pensions are treated as transfers. The average prefiscal Gini coefficient for LAC countries for the PDI and PGT scenarios is 49.8 and 50.6 percent, respectively. In contrast, in the EU countries, the corresponding figures are 35.6 and 46.3 percent, respectively (see Panel A).

[18] The studies included in this analysis are: Argentina (Rossignolo, 2020; Lopez del Valle et al., 2021a); Brazil (Higgins, Pereira, and Cabrera, 2020; Pereira et al., 2022); Colombia (Melendez and Martinez Pabon, 2019a, 2019b); Costa Rica (Sauma and Trejos, 2014; Cabrera and Feoli, 2023); El Salvador (Oliva, 2020a, 2020b, 2020c, 2020d); Guatemala (Cabrera, 2019; Cabrera and Moran, 2020a); Mexico (Scott et al., 2020a, 2020b); Paraguay (Gimenez et al. 2017; Molinas and Gonzalez, 2023); Peru (Jaramillo, 2015, 2020); Uruguay (Bucheli, 2019; Bucheli, Amarante, and Colafranceschi, 2022).

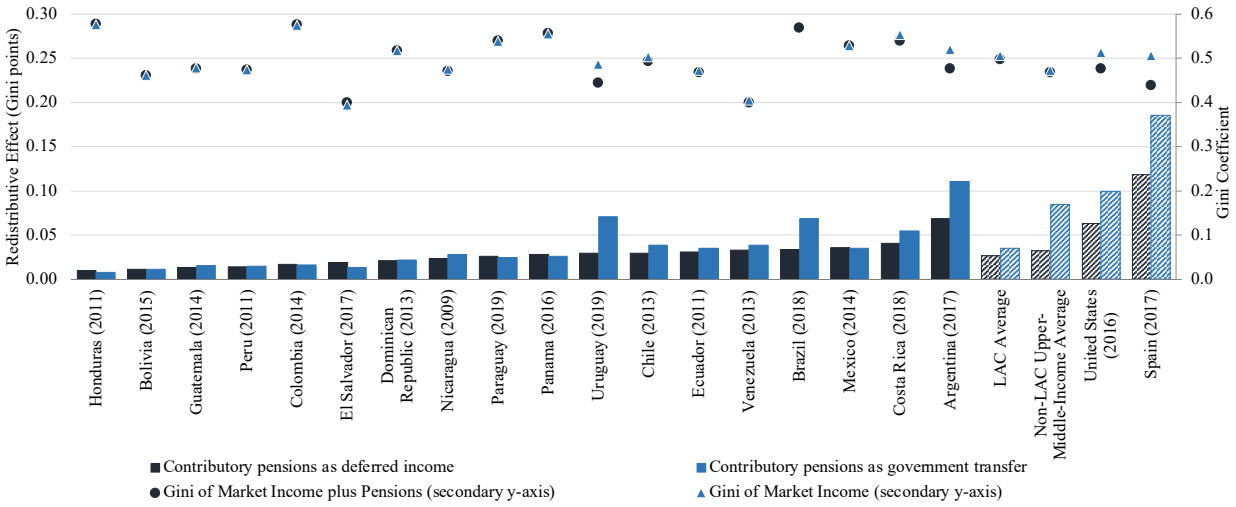
Compared to the United States, prefiscal inequality is higher for LAC when pensions are treated as deferred income, but lower for LAC when pensions are treated as transfers.

FIGURE 5 - Redistributive Effect (in Gini points)

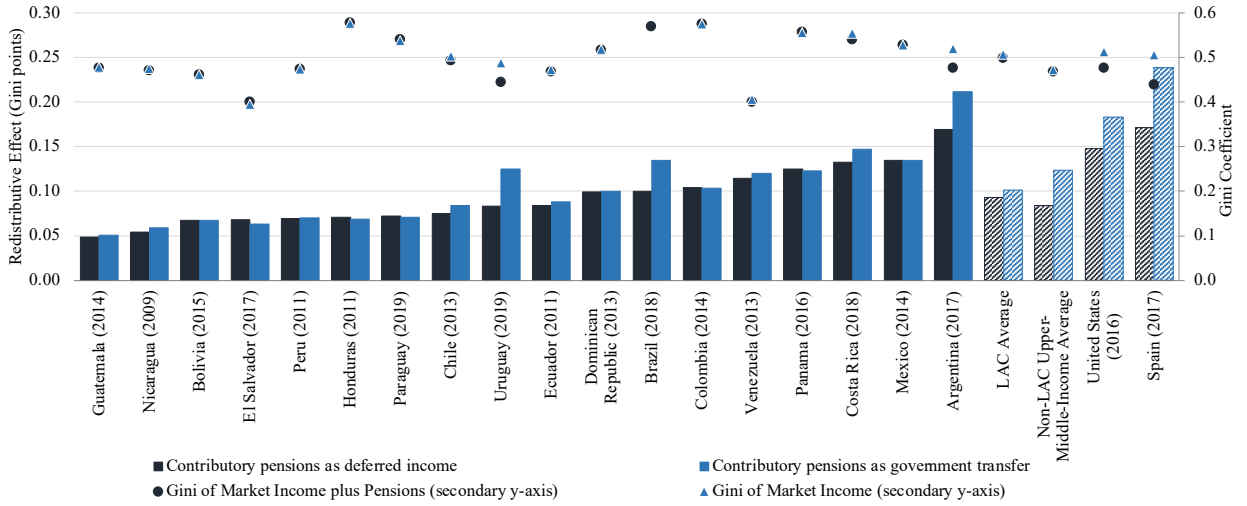
Panel (A) Change in Gini coefficient from Market to Disposable Income




Panel (B) Change in Gini coefficient from Market to Consumable Income



Panel (C) Change in Gini coefficient from Market to Final Income




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); Venezuela (Molina, 2020); and EU (EUROMOD, 2017). See Table B2 in Appendix B for the source of non-LAC countries.

Notes: The year for which the analysis was conducted is in parenthesis. Redistributive effect is defined as the difference between Gini of Market Income plus Pensions and Gini of Disposable/Consumable/Final Income with contributory pensions treated as deferred income and the difference between Gini of Market Income and Gini of Disposable/Consumable/Final Income with contributory pensions treated as transfers. The graph is ranked from the smallest to the largest by redistributive effect, with contributory pensions treated as deferred income. The group of upper-middle-income countries includes Albania, Armenia, Belarus, Botswana, China, Georgia, Jordan, Namibia, Russia, and South Africa. In the European Union pensions include contributory and noncontributory social pensions while in LAC and non-LAC countries the category of pensions includes only contributory pensions.

Second, the redistributive effect is larger in the EU countries (Spain) and, to a lesser extent, in the United States if pensions are considered a government transfer. This pattern is observed for the three definitions of redistributive effect shown in Figure 5. Except for Argentina, Brazil, and Uruguay—countries with large contributory pension systems, whether pensions are treated as deferred income or a transfer makes a relatively small difference. This is not the case in the EU countries where the difference is significant. For instance, Panel A of Figure 5 shows that in the EU, the redistributive effect to Disposable Income with contributory pensions as deferred income and contributory pensions as a transfer is 7.7 and 19.0 Gini points, respectively. In the United States, the numbers are 6.5 and 10.2, respectively. In LAC, the numbers are 2.3 and 3.1 Gini points, respectively. Clearly, the assumption made about how to treat incomes from pensions, again, can make a big difference. The results for the scenario with pensions as transfers for the EU and the United States are influenced by what Lustig (2018) has called the presence of "false poor": that is, many households composed of retirees appear, by definition, with zero or near zero prefiscal income. However, strictly speaking, the counterfactual income should not be zero but what these households would have been able to spend during retirement based on the history of their contributions and market returns.

Third, while pensions in low- and middle-income countries can be equalizing at some times and unequalizing at other times, in neither any EU country nor the United States are contributory pensions unequalizing. On the contrary, pensions exert a large equalizing force in the EU and less so in the United States. In this case, the difference between the Gini of Market Income and the Gini of Market Income plus pensions is 10.7 percentage points in the EU and 3.6 in the United States.

Latin America is composed mainly of upper-middle-income countries. In 2019, the average GNI per person was US$15,531 (in 2017 PPP), while the EU's and the United States' were US$44,358 and US$63,801, respectively. Thus, a comparison with developed countries may not be "fair" since the redistributive effect depends on the size of taxes and transfers, and richer nations have more advanced welfare states by definition and therefore tend to spend more as a share of their national income on social goals. In addition, developed countries have more advanced tax systems and can collect a greater proportion of their revenues from taxes that are more progressive, such as personal income taxes.

How does Latin America compare with the fiscal redistribution in other upper-middle-income countries? In 2019, the ten non-LAC upper-middle-income countries for which comparable studies are available in our database had an average GNI per person of US$15,070. As shown in Figure 5, LAC countries show an average prefiscal inequality higher than non-LAC upper-middle-income countries: 49.8 Gini points compared to 46.8 Gini points for the PDI scenario and 50.6 Gini points compared to 47.2 Gini points for the PGT scenario. In addition, the non-LAC countries achieve a more significant redistributive effect to Disposable Income than LAC countries: 3.3 points vs. 2.3 points for the PDI scenario and 8.8 points vs. 3.1 points for the PGT scenario. Once we account for indirect taxes, subsidies, and in-kind transfers, LAC countries achieve a slightly higher redistributive effect for the PDI scenario (9.3 points vs. 8.4 points) but still a lower redistributive effect for the PGT scenario (10.1 vs. 12.3 points).

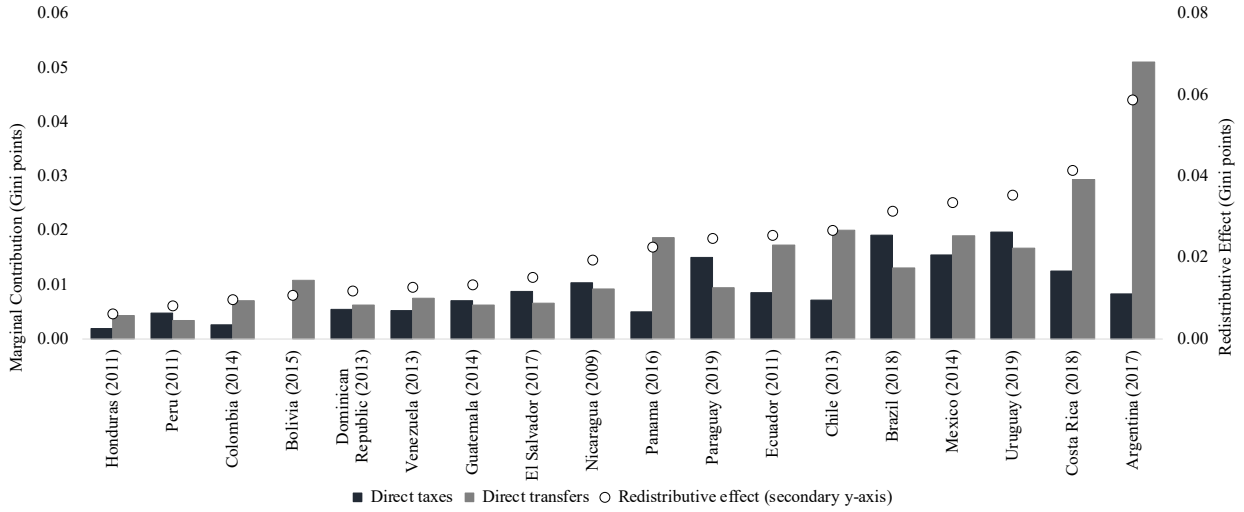
**The Redistributive Impact of Specific Taxes and Transfers**

To quantify the contribution of *specific* taxes and transfers to inequality reduction, we use the "marginal contribution." The marginal contribution is the difference between the Gini (or other inequality measures) for an income concept without the fiscal intervention of interest (for example, VAT) and the Gini for an income concept that includes it. If the marginal contribution is positive (negative), the fiscal intervention of interest is equalizing (unequalizing). Note, however, that due to path dependency issues, one cannot strictly compare the orders of magnitude between marginal contributions calculated based on the redistributive effect for different income categories (see Appendix A for a detailed discussion). The rationale for using the marginal contribution instead of the conventional progressivity measures such as the Kakwani or the Reynolds-Smolensky coefficients is that—whenever the fiscal system is composed of more than one intervention—these coefficients can give the wrong answer. That is, a particular intervention may be classified as progressive (regressive) while its impact is unequalizing (equalizing). This puzzling result was first

discussed by Lambert (1985, 2001). It is the consequence of path dependency and can occur even in the absence of reranking of households (see Appendix A for a detailed discussion).

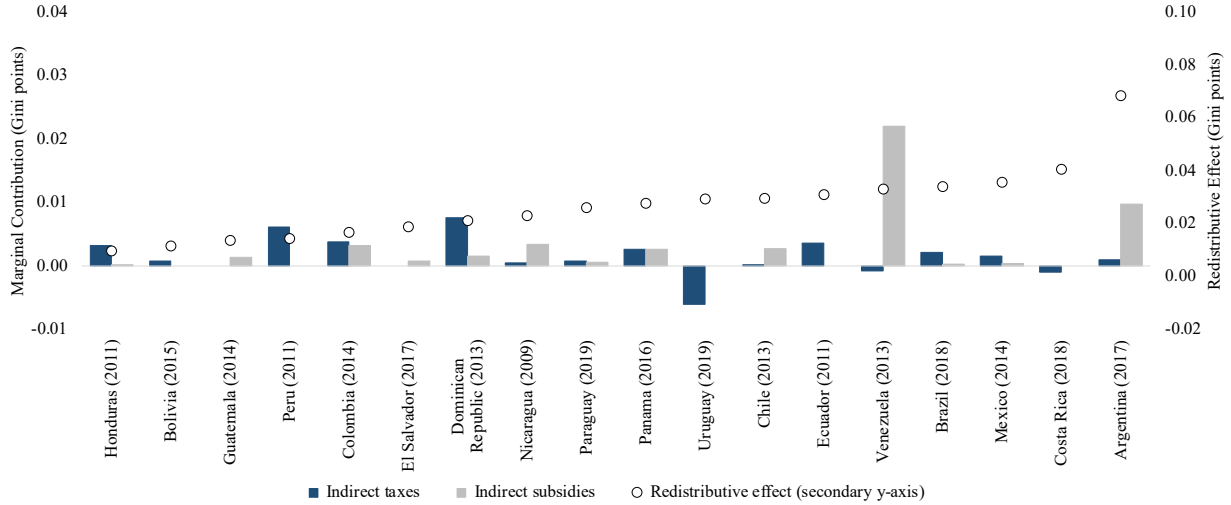
Figure 6 presents the marginal contribution of each tax and transfer for the scenario in which contributory pensions are treated as deferred income (PDI). Results indicate that direct taxes, direct transfers, and spending on education and health are always equalizing (Panels A and C). This result is unsurprising. Contrary to expectations, however, indirect taxes and subsidies are more frequently equalizing than unequalizing (Panel B).[19] Specifically, indirect taxes are equalizing in thirteen of the sixteen countries with available information on this indicator, and subsidies are equalizing in all the thirteen countries with available information on this indicator.[20]

FIGURE 6 - Marginal Contribution of Taxes and Transfers: Contributory Pensions as Deferred Income (PDI Scenario)
Panel (A) Direct Taxes and Transfers

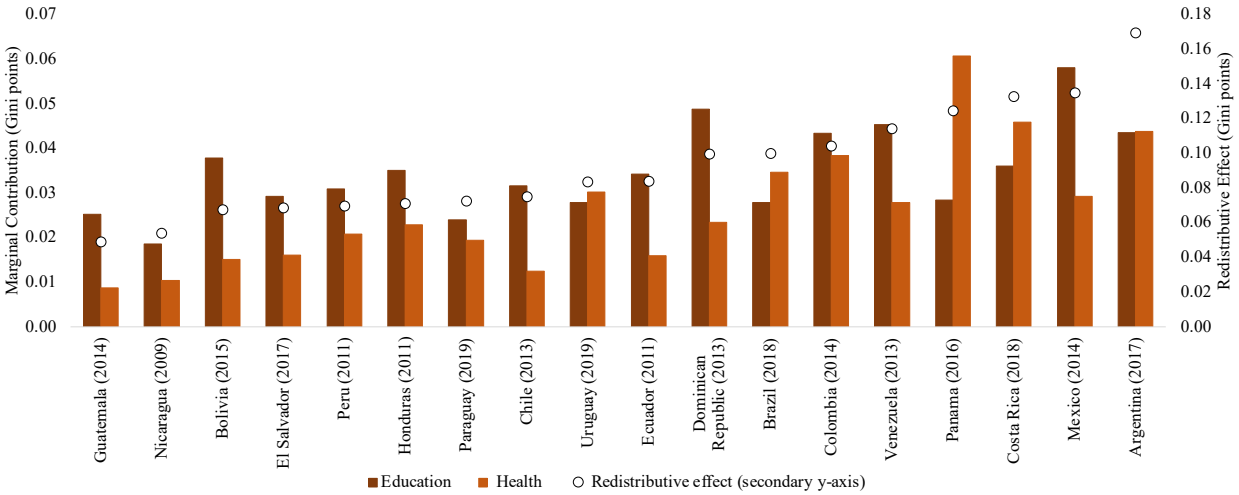



[19] The same pattern is observed for the PGT scenario. See Figure C2 in Appendix C for the results of the PGT scenario.
[20] Note that the results for indirect taxes might be what they are to a large extent because of informality: that is, households do not pay VAT or other indirect taxes on items purchased in the informal markets. Details on the studies used here that adjust for informal purchases are presented in Table B3 in the Appendix. See Bachas, Gadenne, and Jensen (2020) on how informality may cause indirect taxes to be progressive.

Panel (B) Indirect Taxes and Subsidies




Panel (C) In-kind Transfers




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).

Notes: The year for which the analysis was conducted is in parenthesis. The marginal contribution of direct taxes (transfers) is calculated as the difference between Gini of Disposable Income without and with direct taxes (transfers) (panel A). The marginal contribution of indirect taxes (subsidies) is calculated as the difference between Gini of Consumable Income without and with indirect taxes (subsidies) (panel B). The marginal contribution of education (health) transfers is calculated as the difference between Gini of Final Income without and with education (health) transfers (panel C). If the marginal contribution is positive (negative), the fiscal intervention of interest is equalizing (unequalizing). Redistributive effect of direct taxes and transfers is defined as the difference between Gini of Market Income plus Pensions and Gini of Disposable Income (panel A). Redistributive effect of indirect taxes and subsidies is defined as the difference between Gini of Market Income plus Pensions and Gini of Consumable Income (panel B). Redistributive effect of in-kind transfers is defined as the difference between Gini of Market Income plus Pensions and Gini of Final Income (panel C). The graph is ranked from the smallest to the largest by redistributive effect. Bolivia does not have direct taxes. Costa Rica and Uruguay do not have subsidies. The marginal contribution of indirect taxes (without

indirect effects) is not available for Guatemala and El Salvador. The marginal contribution of subsidies (without indirect effects) is not available for Bolivia and Ecuador.

## Pro-poorness of Education and Health Spending

We now analyze to what extent the poor benefit from government spending on education and health. We measure the pro-poorness of public spending on education and health using concentration coefficients (also called "quasi-Ginis").[21] Spending is defined as progressive (regressive) whenever the concentration coefficient is lower (higher) than the Gini for prefiscal income. When this occurs, it means that spending as a share of the prefiscal income tends to fall (rise) with prefiscal income. Within progressive spending, spending is neutral in absolute terms (that is, spending per capita is the same across the income distribution) whenever the concentration coefficient is equal to zero. Spending is defined as pro-poor (also called "progressive in absolute terms") whenever the concentration coefficient is not only lower than the Gini but also has a negative value. Pro-poor spending implies that the per capita spending tends to fall with prefiscal income. Any time spending is pro-poor or neutral in absolute terms, it is by definition progressive. The converse, of course, is not true.

Table 2 summarizes the results regarding the pro-poorness of government spending on education and health for the scenario in which contributory pensions are treated as deferred income (PDI) (see Table C1 in Appendix C for the results of the PGT scenario). In this analysis, households are ranked by per capita Market Income plus Pensions and no adjustments are made to their size because of differences in the composition by age or gender. Total spending on education is pro-poor in LAC except for Honduras and Nicaragua, where it is neutral in absolute terms. Preschool and Primary school are pro-poor in all countries. Spending on secondary school tends to be pro-poor, except in El Salvador, Guatemala, Mexico, and Nicaragua, where either lower or upper (or both) secondary is neutral or progressive only in relative terms. Spending on tertiary education is regressive in Guatemala and progressive only in relative terms in various degrees in the rest of the countries.

[21] A concentration coefficient is calculated in a way analogous to the Gini coefficient. Let $p$ be the cumulative proportion of the total population when individuals are ordered in increasing income values using prefiscal income and let $C(p)$ be the cumulative proportion of total program benefits received by the poorest $p$ percent of the population. Then, the concentration coefficient of that program is defined as $2\int_0^1 (p - C(p))dp$.

TABLE 2 - Progressivity and Pro-Poorness of Education and Health Spending: Contributory Pensions as Deferred Income (PDI Scenario)

| Country | Total Education | Pre-school | Primary | Secondary | Lower secondary | Upper secondary | Tertiary | Health |
|---|---|---|---|---|---|---|---|---|
| Argentina (2017) | A | A | A | A | | | C | B |
| Bolivia (2015) | A | A | A | A | | | C | C |
| Brazil (2018) | A | A | A | A | | | C | A |
| Chile (2013) | A | A | A | A | | | C | A |
| Colombia (2014) | A | A | A | | A | A | C | C |
| Costa Rica (2018) | A | A | A | A | | | C | C |
| Dominican Republic (2013) | A | A | A | | A | A | C | A |
| Ecuador (2011) | A | A | A | | A | A | C | B |
| El Salvador (2017) | A | A | A | | | B | C | C |
| Guatemala (2014) | A | A | A | | A | C | D | C |
| Honduras (2011) | B | A | A | | | | | B |
| Mexico (2014) | A | A | A | | A | B | C | C |
| Nicaragua (2009) | B | A | A | | B | B | C | C |
| Panama (2016) | A | A | A | A | | | C | A |
| Paraguay (2019) | A | A | A | A | | | C | A |
| Peru (2011) | A | A | A | A | | | C | B |
| Uruguay (2019) | A | A | A | | A | A | C | A |
| Venezuela (2013) | A | A | A | A | | | B | A |

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).
Notes: The year for which the analysis was conducted is in parenthesis. [A] Pro-poor, concentration coefficient is negative. [B] Neutral, concentration coefficient equals zero. [C] Progressive, concentration coefficient is positive but lower than Gini of prefiscal income. [D] Regressive, concentration coefficient is positive and higher than Gini of prefiscal income.

Health spending is pro-poor in Brazil, Chile, the Dominican Republic, Panama, Paraguay, Uruguay, and Venezuela. In Argentina, Ecuador, Honduras, and Peru, the per capita benefit is roughly the same across the income scale (neutral). In Bolivia, Colombia, Costa Rica, El Salvador, Guatemala, Mexico, and Nicaragua health spending per person is progressive only in relative terms.

While the results regarding the pro-poorness of spending on education and health are quite encouraging, consider that guaranteeing access to and facilitating usage of public education and health services for the poor is not enough. As long as the quality of schooling and healthcare provided by the government is low, distortive patterns will be a major obstacle to the equalization of opportunities (more on this in the next section).

## 6. Fiscal Policy and the Poor

The above discussion has concentrated on the impact of fiscal policy on income inequality. However, as important is the impact of fiscal policy on poverty, particularly because the results do not necessarily go in the same direction. In other words, an inequality-reducing fiscal system could be poverty-increasing. The impact of fiscal policy on poverty depends on the size, composition,

and progressivity of government spending and revenues, but there is not a fundamental equation analogous to the inequality impact that links them. In this section, we present the redistributive impact of fiscal policy on poverty, followed by a discussion on the extent to which the outcomes are related to whether the poor pay taxes (regardless of their progressivity) or not.

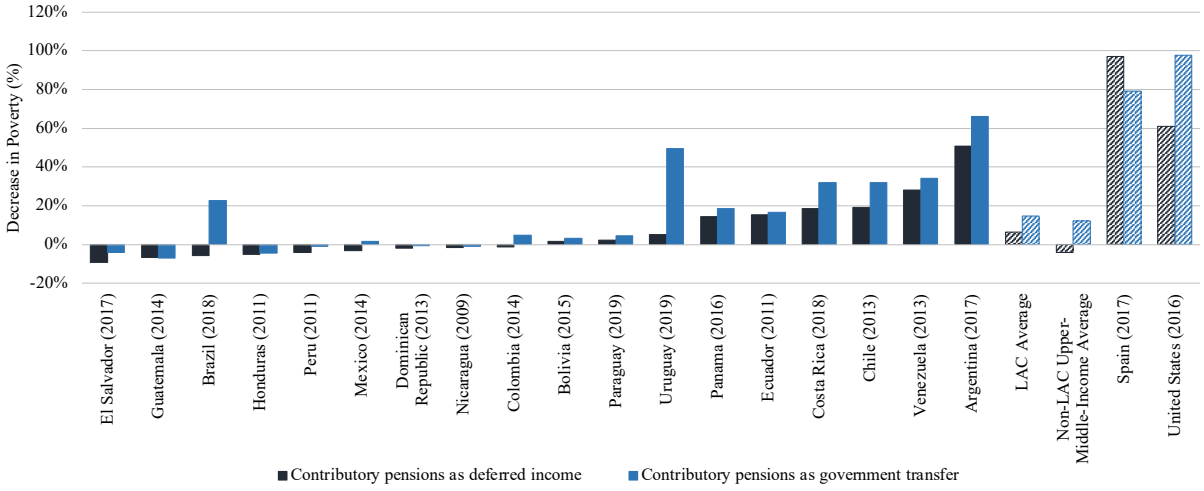
The impact of fiscal policy on poverty can be measured using typical indicators such as the headcount ratio for prefiscal income and the headcount for postfiscal income. Another measure that one can use to assess the impact of fiscal policy on the poor is fiscal impoverishment, or the extent to which fiscal policy makes the poor (non-poor) poorer (poor) (see Higgins and Lustig, 2016). A third measure is that of the extent to which prefiscal poor end up being net payers to the fiscal system.

A clarification is in order. When analyzing the impact of fiscal policy on poverty, one should focus on the "cash" portion of the fiscal system (direct taxes, direct transfers, indirect taxes, and subsidies) and not include the "noncash" portion, such as the monetized value of the use of government education and health services. The reason is that education and health services are not really "income" and, importantly, are not considered as part of income when establishing poverty lines. Therefore, to analyze the impact of fiscal policy on poverty, we compare the indicators for prefiscal income with the same indicators using Consumable Income.[22] If Consumable Income is higher than prefiscal income for the poor, the state has enabled an individual to purchase more private goods and services than with her original prefiscal Income.

Figure 7 presents the percentage change between the headcount ratio for Market Income plus Pensions (and Market Income) and the headcount for Consumable Income. If the measure is positive (negative), postfiscal poverty is lower (higher) than prefiscal poverty. Results use country-specific international poverty lines. That is, we use the World Bank Income Class International Poverty Lines (in 2011 Purchasing Power Parity dollars) of US$3.20 a day for lower-middle-income countries and US$5.50 a day for upper-middle-income countries (see Jolliffe and Prydz; 2016).

[22] Figure C3 in Appendix C presents the version of Figure 1 with the core income concepts that are relevant for the analysis of the impact of fiscal policy on poverty. That is, those that capture the "cash" portion of the fiscal system only.

FIGURE 7 - Fiscal Policy and Poverty Reduction: Percentage Change in Headcount Ratio from Market to Consumable Income (in %), Country-Specific International Poverty Lines




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.

Notes: The year for which the analysis was conducted is in parenthesis. A decrease in poverty is defined as the percentage change between the headcount ratio of Market Income plus Pensions and headcount ratio of Consumable Income with contributory pensions treated as deferred income and the percentage change between headcount ratio of Market Income and headcount ratio of Consumable Income with contributory pensions treated as transfers. If the measure is positive (negative), poverty is decreasing (increasing). The graph is ranked from the smallest to the largest decrease in poverty, with contributory pensions treated as deferred income. Country specific poverty lines (in 2011 PPP) are Bolivia, El Salvador, Honduras, Nicaragua: $3.20 a day international poverty line; and Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Panama, Paraguay, Perú, Uruguay, Venezuela: $5.50 a day international poverty line. The group of upper-middle-income countries includes Armenia, Botswana, China, Georgia, Jordan, Namibia, Russia, and South Africa.

Figure 7 shows that, on average, fiscal policy in LAC lowers poverty measured by the headcount ratio. However, there is a startling result. In both scenarios, the headcount ratio for Consumable Income in the Dominican Republic, Guatemala, El Salvador, Honduras, Nicaragua, and Peru is higher than the headcount ratio for prefiscal income. This phenomenon also occurs in Brazil, Colombia, and Mexico for the PDI scenario. Fiscal incidence studies available for Brazil, Colombia, El Salvador, Guatemala, Mexico, and Peru show that the poverty-increasing characteristic of fiscal policy in these countries has persisted over time.[23] When using the squared poverty gap index to measure the impact of fiscal policy on poverty, the results show that fiscal policy in LAC lowers poverty in all

[23] See Brazil (Higgins, Pereira, and Cabrera, 2020; Pereira et al., 2022); Colombia (Melendez and Martinez Pabon, 2019, 2019b); El Salvador (Oliva, 2020a, 2020b, 2020c, 2020d); Guatemala (Cabrera, 2019; Cabrera and Moran, 2020a); Mexico (Scott et al., 2020a, 2020b); Paraguay (Gimenez et al. 2017; Molinas and Gonzalez, 2023); and Peru (Jaramillo, 2015, 2020).

countries except Guatemala. This result suggests that fiscal policy makes the poorest of the poor worse in Guatemala, while in the other LAC countries, the impoverishing effect affects those individuals with a prefiscal income close to the poverty line more.[24]

This worrisome result in which the postfiscal headcount ratio is higher occurs even though the net fiscal system (even without including in-kind transfers) reduces inequality. The result is also observed in some of the non-LAC upper-middle-income countries (Armenia, Botswana, China, Namibia, and South Africa) we used as comparators. Interestingly, while the non-LAC upper-middle-income countries seemed to outperform LAC when observing the redistributive effect on inequality, they do notably worse when the focus is on poverty impacts. In contrast, in developed countries like Spain and the United States, the results show that fiscal policy significantly reduces the headcount ratio. The finding that net fiscal policy in developing countries increases poverty emphasizes the fact that the impact of fiscal interventions on inequality and poverty should be studied separately, as discussed in Lustig (2022).[25]

It is important to note that the poverty measures (and the Gini coefficient in the previous section) show results with households ranked by each corresponding income level. That is, they are anonymous indicators. Thus, the poorest individuals in the prefiscal income space may not coincide with the poorest individuals in the postfiscal income space, for instance. One may also be interested in how fiscal policy affects specific individuals. This requires nonanonymous comparisons: that is, to rank households by per capita *prefiscal* income and keep this ranking fixed. Nonanonymous measures reveal how the state affects individuals' welfare levels and should also be used for welfare comparisons (rather than the anonymous indicators). For more on this, see Bourguignon (2011).

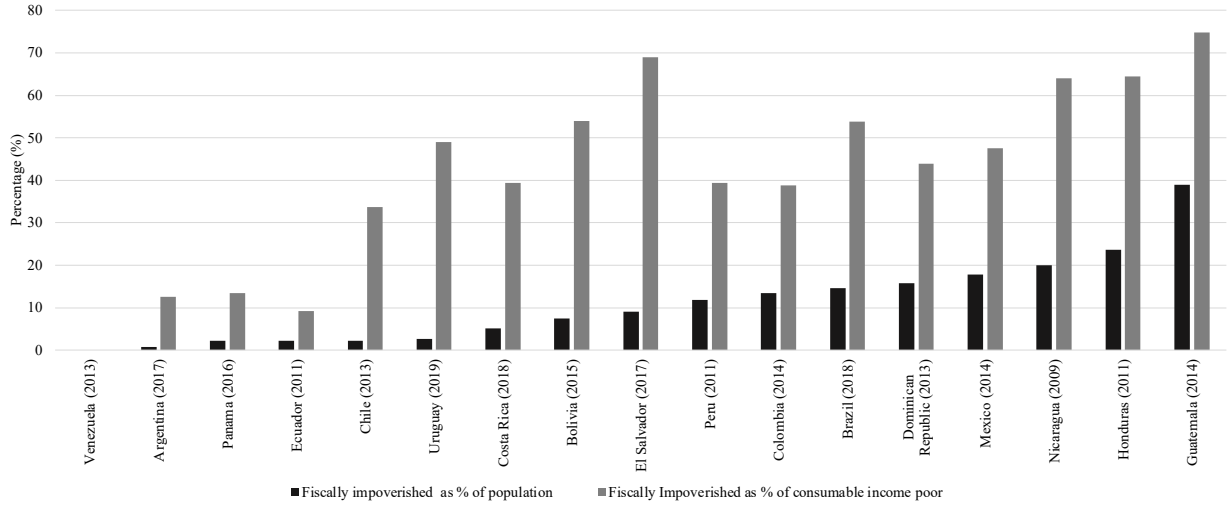
A novel nonanonymous poverty indicator was first proposed by Higgins and Lustig (2016). In the context of fiscal policy, the authors called this indicator Fiscal Impoverishment. Figure 8 presents two indicators of Fiscal Impoverishment for the PDI scenario. One shows the proportion of poor (non-poor) people who were made poorer (poor) by the fiscal policy as a share of the total population. The second indicator of Fiscal Impoverishment is equal to the proportion of poor (non-poor) people who were made poorer (poor) by fiscal policy as a share of the Consumable Income poor. The results suggest that, except for Venezuela, the share of individuals made poorer by the fiscal systems in LAC is not trivial. This undesirable result occurs even though in all countries the fiscal system is inequality-reducing. In fact, in all the countries, with the exception of Venezuela,

[24] See Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).

[25] Although Bachas, Gadenne, and Jensen (2020) do not calculate the effect of informal consumption on poverty indicators, one would expect that as countries reduce the extent of informality, more cases will show that postfiscal poverty is above prefiscal poverty levels.

although poverty declines (see above), there is fiscal impoverishment.

Figure 8 - Fiscal Impoverishment, Country-Specific International Poverty Lines



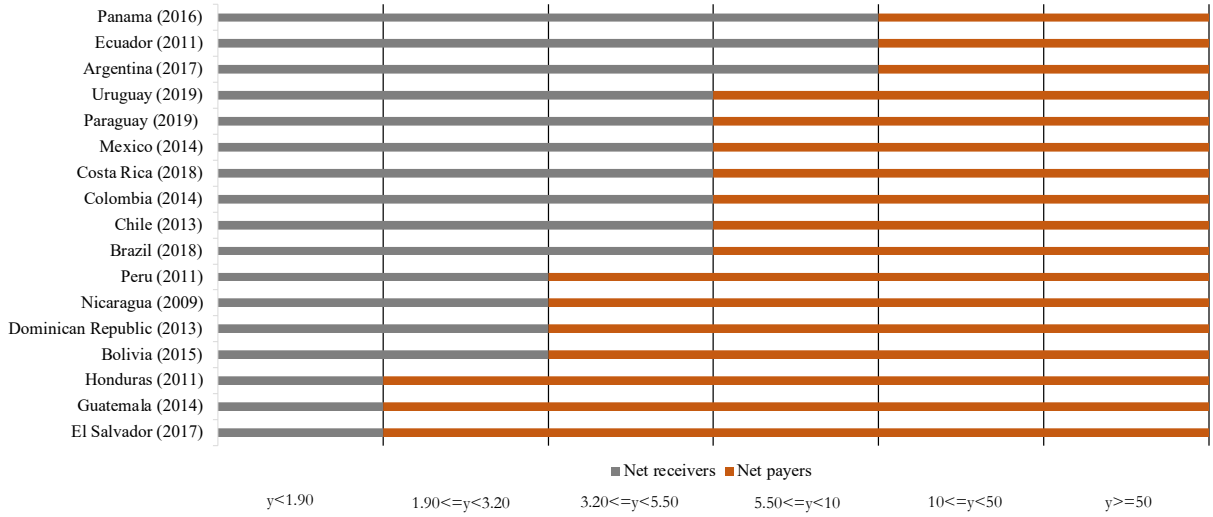

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).

Notes: The year for which the analysis was conducted is in parenthesis. Contributory Pensions as Deferred Income (PDI Scenario). The graph is ranked from the smallest to the largest fiscal impoverishment (as % of total population) with contributory pensions treated as deferred income. Country specific poverty lines (in 2011 PPP) are Bolivia, El Salvador, Honduras, Nicaragua: $3.20 a day international poverty line; and Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico, Panama, Paraguay, Perú, Uruguay, Venezuela: $5.50 a day international poverty line.

One reason behind the previous results is that the prefiscal poor are net payers to the fiscal system in several of the countries. In principle, it would be desirable for the poor—especially the extreme poor—to be net receivers of fiscal resources in cash (that is, they receive in transfers and subsidies more than what they pay in direct and indirect taxes) so that poor individuals can consume the minimum amounts of food and other essential goods embedded in the selected poverty line. Figure 9 shows at which prefiscal income category individuals become net payers to the fiscal system on average for the PDI scenario (see Figure C4 in Appendix C for the results of the PGT scenario).[26] In El Salvador, Guatemala, and Honduras, net payers to the fiscal system begin in the "extreme poor" income group, and in Bolivia, the Dominican Republic, Nicaragua, and Peru, net payers to the fiscal system begin in the "moderate poor" income group. In seven countries, the net payers start in the group known as "vulnerable" and in three countries, the net payers start in the "middle-class" income group. In Venezuela, all groups are net receivers except for the "rich."

[26] Income categories in terms of 2011 PPP are: extreme poor (below $3.20 a day), moderate poor (between $3.20 and $5.50 a day), vulnerable (between $5.50 and $10 a day), middle class (between $10 and $50 a day), and rich (above $50 a day). These income categories are based on Lopez-Calva and Ortiz-Juarez (2014) and Ferreira et al. (2012), which were updated to 2011PPP by Jolliffe and Prydz (2016).

FIGURE 9 - Net Payers to the Fiscal System by Income Groups: Contributory Pensions as Deferred Income (PDI Scenario)




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).
Notes: The year for which the analysis was conducted is in parenthesis.

## Taking Efficiency and the Quality Dimension into Account

The above results were carried out under certain simplifying assumptions that allow for a homogenous and transparent framework to compare countries over time. Policymakers, however, might find it important in some cases to make explicit the lack of effectiveness in allocating spending or raising revenue since the fiscal system could have achieved the same result with fewer resources. They may also want to analyze if, apart from the first-round effects of taxes and public spending, behavioral effects could significantly alter their incidence. Moreover, in-kind transfers that are assumed to be equalizing when computed in the per capita amount of education or health spending might also entail quality differences among the poor and non-poor that, when taken into account, could diminish the measured incidence of in-kind transfers. Below, we discuss the incorporation of efficiency and quality aspects of fiscal policies and behavioral effects on some transfers and the probable change in incidence results.

With respect to the (in)efficiency of redistributive spending on direct transfers, Izquierdo and Pessino (2018) estimate that the leakages of non-contributory pensions and conditional cash transfer programs in 15 countries of LAC amounted to 0.5% of GDP in 2015, which, if considering leakages in subsidies and tax expenditure, add up to 1.7% of GDP on average. The savings from avoiding leakages could then be allocated to improve coverage and lift the extreme poor out of poverty. For instance, Pessino and Alaimo (2018) estimate that closing the extreme poverty gap (using the $2.50 PPP per capita a day poverty line) with a perfectly targeted cash transfer would require more than

3 percent of GDP in Honduras and Nicaragua but 1 percent or less in Costa Rica and Uruguay.

Regarding the simplifying assumption of no behavioral changes, there is evidence that transfers are likely to have a direct (first round) distributive effect and a behavioral disincentive (second round) that, when considered, could counteract the initial impact. In particular, while most non-contributory programs in the region help reduce poverty and inequality without impacting labor force participation, there is consistent evidence showing that they produce an unintended incentive to enter informality.[27] The incentives to informality are related to the fact that informal workers benefit from an unbundled set of government-sponsored parallel programs, so-called "noncontributory programs." The ("unwanted") behavioral effects likely increase prefiscal income inequality and poverty; therefore, fiscal incidence analysis may exaggerate the true effect of the redistributive policies on postfiscal income inequality.

Results from Pessino and Alaimo (2018), in Table 3, allow us to analyze the second-round effect of a noncontributory program on prefiscal inequality and poverty in the case of Argentina. The effects were simulated using the estimates of Garganta and Gasparini (2015) on how the Asignacion Universal por Hijo (AUH) (Argentina's flagship program) incentivized informality between 2.8 and 3.6 percentage points. The authors estimate that when considering the first-round effects only, the Gini coefficient fell from 0.417 to 0.399 with the introduction of the AUH. However, when considering behavioral responses (that is, that some workers employed in the formal sector chose to have an informal job), the Gini coefficient without the AUH would have been 0.414 instead of 0.417. Hence, first-round incidence effects exaggerate the "true" effect of the AUH on inequality by 0.3 points (and on moderate poverty by 0.6 percentage points). In sum, not considering the behavioral effects implies that the incidence of inequality and poverty is overestimated between 16 and 20 percent.

TABLE 3 - Poverty and Inequality Incidence Before and After the AUH With and Without Disincentive Effect in Argentina, 2015 (1st Semester)

| Indicator | Pre-transfer (actual, with formal moving to informality) | Pre-transfer (counterfactual, without formal moving to informality) | Post-transfer |
|---|---|---|---|
| Income | 12,754 | 12,810 | 13,023 |
| Extreme Poverty | 7.7 | 7.5 | 4.1 |
| Moderate Poverty | 31.4 | 30.8 | 28.6 |
| Gini Coefficient | 0.417 | 0.414 | 0.399 |

Source: Pessino and Alaimo (2018).

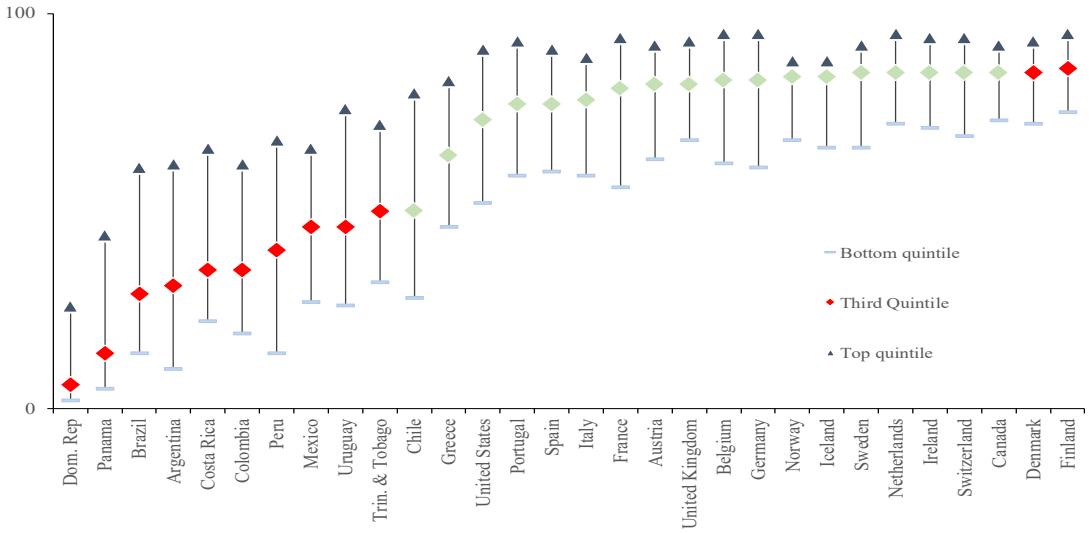
[27] Although studies of the undesired effects of cash transfer programs on adult workers concluded that they had an important disincentive effect in developed countries (see Moffitt (2002), Lemieux and Milligan (2008), and Hoynes and Schanzenbach (2012)) and little or no impact on the propensity to work or hours worked in LAC (see Alzúa, Cruces, and Ripani (2013) and Banerjee et al., (2017)), there is growing evidence of the negative effect of noncontributory programs on formal labor force participation and formal work hours in the region (see Bergolo and Cruces (2018), Bosch and Campos-Vázquez (2014), Bosch and Guajardo (2012), and Camacho, Conover, and Hoyos, (2014)).

Finally, starting from the fact that one of the objectives of fiscal policy should be equalizing opportunities and not just focusing on the inequality of access, we analyze aspects related to the quality of spending on education.[28] Fiscal incidence analysis only measures the distribution of the costs to the government or access to public services in education and health. However, while the distribution of inputs might be pro-poor and progressive, the distribution of quality and outcomes might be mostly pro-rich. A typical pattern observed in the region is that the progressivity of access is related to the fact that the middle classes and the rich opt out of publicly provided services.[29] Below, we document the pro-richness of the distribution of quality of services in education.

LAC countries have improved educational enrollment rates in recent decades and educational attainment has risen from an average of three years of schooling in 1950 to more than nine years in 2015. Significant increases in public spending fueled the expansion in enrollment rates. The region spends on average 3 percentage points more of its GDP on education than 25 years ago, and it is catching up with the spending of developed countries. However, education access and outcomes remain much worse for disadvantaged groups, partly because of pro-rich biases in access and quality. Indeed, about 50 percent of the poorest youth in the region do not finish a lower secondary education, compared to 10 percent in the richest quintile (Pessino and Alaimo, 2018). The contrast is even greater for upper secondary and tertiary education. The same pattern prevails across education outcomes, as measured by the Program for International Student Assessment (PISA) 2018 results, students from the poorest households in the region have only an 18 percent chance of performing above level 2 in mathematics, compared to 62 percent for students from the richest households (see Figure 10).[30] In turn, a student from the richest household in the region performs, on average, approximately as well as the poorest students in advanced-country households. Furthermore, the best LAC country performs, on average, worse than the worst advanced country in terms of inequality of performance by socioeconomic status (the absolute gap in performance is even greater).[31]

[28] A similar analysis for health services can be found in Pessino and Alaimo (2018) and Barofsky and Younger (2022).
[29] See De La O, Rossel, and Manzi (forthcoming) for a detailed exploration of the extent to which Latin Americans opt-out from public to private education and health services.
[30] PISA includes an ESCS index (Economic, Social and Cultural Status) derived from the student responses about home possessions and the parents' education and occupation as a proxy for household income. We analyzed the relation between the student's socioeconomic background, secondary school completion and mathematics performance.
[31] In addition, the concentration curve of math attainment for lower secondary students in the average of LAC countries reflects the lower performance of poor students compared to the rich: the concentration coefficient is 0.234 for LAC and 0.078 for advanced countries in Europe and North America.

FIGURE 10 - Percentage of Students Performing Above Level 2 in Mathematics (PISA 2018) by Quintile of ESCS, Selected Latin American and Advanced Countries




Source: Authors' calculation based on UNESCO, World Inequality Database on Education.

Of course, better schools are not the only factor shaping students' success, early life experiences also matter. Fifteen-year-old students in the OECD who attended early childhood education tend to perform better on standardized tests than those who did not, even after accounting for their socio-economic backgrounds (OECD, 2013, 2019). Indeed, evidence points to returns in the later stages of child schooling being higher for high-ability children from more advantaged environments, while interventions at very early ages have higher returns for the most disadvantaged (Cunha and Heckman, 2007). However, the socioeconomic gap observed in performance among adolescents reflects the lack of early childhood interventions and the failure of schools and other interventions to remediate it later in life. It is because of these factors that valuing school attendance for the poor at cost might be overvaluing the true improvement in present and future income.[32]

## 7. Towards a Characterization of Fiscal Systems in LAC

In this section, we explore some key relationships using the unique information housed in the CEQ Data Center on Fiscal Redistribution. The uniqueness of this database stems from the fact that the underlying fiscal incidence studies applied a common methodology, something that is not the case in other databases which most frequently than not rely on secondary sources and in which even something as crucial as the prefiscal income concept is not necessarily the same across countries. In addition, the CEQ Data Center's indicators of fiscal redistribution include the impact of indirect taxes and subsidies as well as in-kind transfers such as education and health spending while the analyses that use secondary sources include direct taxes and transfers only. Our analysis uses information on fiscal redistribution for 58 countries (of which 18 correspond to LAC as

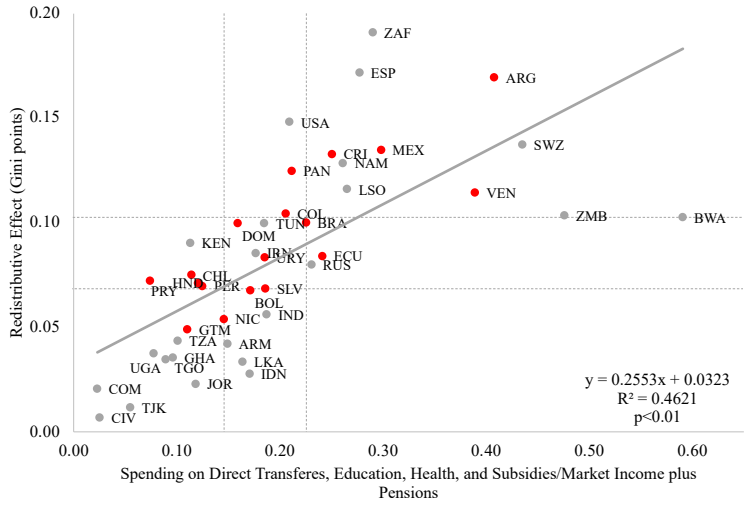
[32] There are several methods contemplated in the literature to correct these costs per student that estimate the benefit of education and healthcare services to recipients rather than the cost to the government (see Lustig, 2022 Vol II).

already indicated).

We know from theory that the extent of inequality reduction depends on the size and progressivity of taxes and transfers (Lambert, 2001). Indeed, this is the case empirically. In Figure 11, we plot the relationship between spending on direct transfers, education, health, and subsidies as a share of prefiscal income and the total redistributive effect.[33] The figure shows that the size of the inequality-reducing effect is correlated with the share of fiscal effort (that is, social spending and subsidies to prefiscal income) for all countries and for LAC countries only as well. In other words, high (low) redistribution is driven by high (low) spending. We can also observe that –as mentioned earlier—LAC countries are quite heterogeneous. There are countries that fall into the high spending-high redistribution quadrant, into the medium-medium quadrant, and into the low-low quadrant.[34] Thus, there is no "LAC-specific pattern" when it comes to how much societies are willing to engage in tax-based redistribution.

FIGURE 11 - Social Spending/Prefiscal Income and Redistributive Effect: Contributory Pensions as Deferred Income (PDI Scenario)

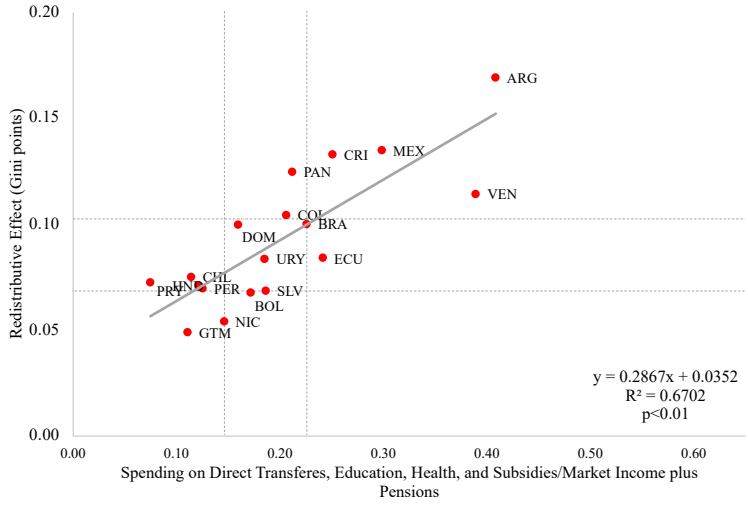
Panel (A) All countries




[33] Here, total redistributive effect includes both the cash and "noncash" components of the fiscal system. The plot is shown for the PDI scenario. See Figure C5 in Appendix C for the results of the PGT scenario.

[34] Table C2 in Appendix C summarizes spending by component for each of the nine categories of redistributive effect and spending based on Figures 11 and C5. The results show that LAC countries tend to spend more (as a share of prefiscal income) on education and health than on direct transfers or subsidies. It is not clear, however, that countries with high levels of redistribution (with either high or medium spending) tend to devote significantly more resources to direct transfers, education, or subsidies (as a share of prefiscal income) than the average LAC country.

Panel (B) LAC




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.

Notes: The dotted lines are the 1/3 and 2/3 percentiles of the variables when all countries are accounted for. The grey line is the slope obtained from a regression with the redistributive effect as dependent variable. Redistributive effect is defined as Gini of Market Income plus pensions minus Gini of Final Income. LAC countries are marked in red and non-LAC countries are marked in grey. * $p < 0.1$, ** $p < 0.05$, ***$p < 0.01$.

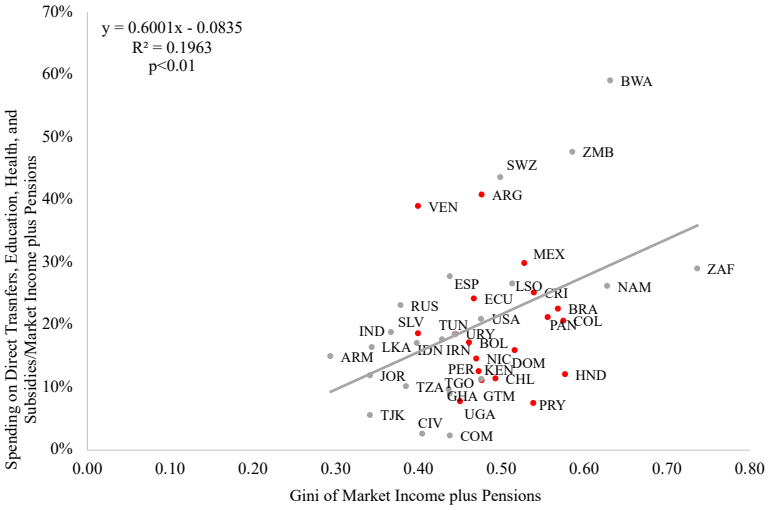
Having established that the extent of redistribution depends on the amount of resources devoted to this effort, do more unequal societies devote more, or less, of fiscal resources to redistributive ends? While Mirrlees' optimal taxation theory implies that greater prefiscal inequality leads to higher redistributive effort by governments (Mirrlees, 1971), in the literature there are two contrasting predictions based on political economy dynamics. For instance, Lindert (2004) finds that prefiscal inequality is negatively correlated with redistributive effort. He finds that across countries and over time, resources devoted to the poor are lower in nations where poverty and inequality are greater. Lindert calls this phenomenon the "Robin Hood paradox" and argues that it occurs because elites are opposed to (or don't care about) redistribution, and in undemocratic societies, the elites' preferences dominate fiscal policy outcomes. In contrast, Meltzer and Richard's median voter model predicts that whenever the difference between the average income and the median income of voters increases (a measure of higher inequality), the support for redistribution in democracies will be higher (Meltzer and Richard, 1981). Recent empirical evidence, however, suggests mixed results regarding the relationship between prefiscal inequality and redistribution. For instance, while Jantti, Pirttila, and Ronkko (2020) estimate a positive relationship between these two variables for an analysis including 47 developed and developing countries worldwide, Niño-Zarazúa et al. (2023) estimate a negative result worldwide (including 116 countries) and a

positive result for the Sub-Saharan Africa region.

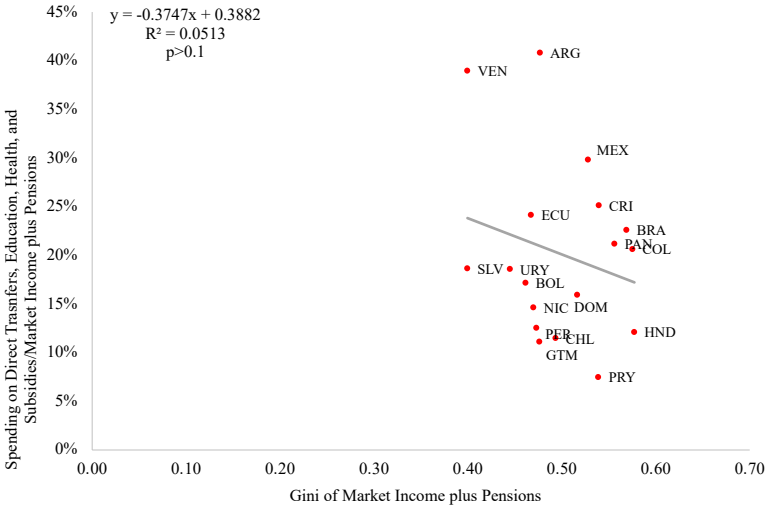
In our sample of 58 countries, we find that prefiscal income inequality is positively associated with higher social spending, and the coefficient is significant (see Figure 12 for the PDI scenario and Figure C6 in the Appendix for the PGT scenario). However, this is not the case in LAC. The slope is negative when accounting for all LAC countries, albeit not statistically significant. Interestingly, when excluding Argentina and Venezuela, two outliers in the region for the amount they invest in social spending, the slope is positive but still not significant. These results show that, in the best of cases, social spending plus subsidies in LAC is orthogonal (i.e., unrelated) to the level of prefiscal inequality. In this respect, and perhaps unsurprisingly, LAC countries seem to be part of the countries where elites are opposed to or do not care about redistribution (see Busso et al. (forthcoming) for additional evidence on this topic).

FIGURE 12 - Prefiscal Inequality and Social Spending/Prefiscal Income: Contributory Pensions as Deferred Income (PDI Scenario)

Panel (A) All countries



Panel (B) LAC




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.

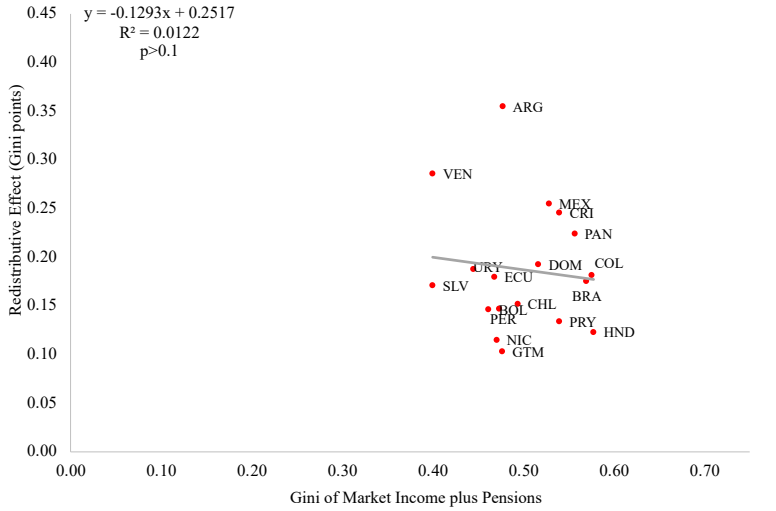
Notes: The grey line is the slope obtained from a regression with social spending and subsidies/prefiscal income as dependent variable. Social spending includes direct transfers, spending on education and health, and other social spending. LAC countries are marked in red and non-LAC countries are marked in grey. * $p < 0.1$, ** $p < 0.05$, ***$p < 0.01$.

Another way to test whether fiscal redistribution is positively correlated with prefiscal inequality is to replace spending with the redistributive effect measured as the difference of the postfiscal income Gini minus the prefiscal one on the y-axis. We show this in Figure 13 for the PDI scenario (see Figure C7 in the Appendix for the PGT scenario). For the full sample, again, the slope is positive and significant: the redistributive effect increases with prefiscal income inequality. For LAC, although not statistically significant, the slope is negative when pensions are treated as deferred income and positive when treated as government transfers (it is always positive and not significant when excluding Argentina and Venezuela).

FIGURE 13 - Prefiscal Inequality and Fiscal Redistribution: Contributory Pensions as Deferred Income (PDI Scenario)

Panel (A) All countries


Panel (B) LAC




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.
Notes: The grey line is the slope obtained from a regression with the redistributive effect as dependent variable. Redistributive effect is defined as Gini of Market Income plus Pensions minus Gini of Final Income. LAC countries are marked in red and non-LAC countries are marked in grey. * p < 0.1, ** p < 0.05, ***p < 0.01.

Together, our exploration of the role of resources devoted to redistribution and prefiscal inequality on the redistributive effect of the fiscal system suggests there is no evidence of a "Robin Hood paradox" in which resources devoted to the poor are lower in nations where poverty and

inequality are greater. Still, it does not provide robust evidence that redistribution from rich to poor is greater in countries where prefiscal inequality is higher (i.e., the "Mirrlees prediction").[35] This particularly does not seem to be the case for LAC countries. Therefore, the results for the LAC region call for an exploration of alternate interpretation of the relationship between prefiscal inequality and inequality reduction efforts. In the LAC region, among the factors that could be driving these results is the role of elites and political parties in capturing the fiscal policy. Further research is needed to establish the extent to which this is the case.[36]

## 8. Conclusions

Using fiscal incidence analysis, this paper examines the impact of fiscal policy on inequality and poverty in LAC. We use data from CEQ Assessments for eighteen LAC and forty non-LAC (low-, middle-, upper-middle, and high-income) countries housed in the CEQ Data Center on Fiscal Redistribution. To the best of our knowledge, this data includes the most complete comparable estimates of fiscal redistribution on a global scale, including other non-rich countries. Also, to the best of our knowledge, this is the first time in which LAC countries' fiscal redistribution is compared with that in non-LAC upper-middle-income countries.

Our main conclusions are as follows. First, the LAC region is very heterogeneous and not a relevant category beyond the geographical proximity of the countries. There is considerable prefiscal income inequality and poverty heterogeneity across the LAC countries. Likewise, the income inequality and poverty reduction induced by the fiscal system are quite heterogeneous.

Second, LAC fiscal systems are always equalizing. However, the same cannot be said for poverty. In nine of the eighteen countries, fiscal policy increases poverty. That is, a larger number of the prefiscal poor (non-poor) are made poorer (poor) by taxes and transfers than the number of people who escape poverty. This startling result is primarily the consequence of high consumption taxes on basic goods. For a sample of countries with multiple CEQ Assessments, the evidence suggests this pattern has not improved over time.

Third, on average, LAC's inequality reduction is somewhat lower than in non-LAC upper-middle-income countries and, as expected, considerably lower than in advanced countries. In contrast, LAC outperforms the non-LAC upper-middle-income countries on the poverty reduction

[35] Note that results associating redistribution and prefiscal inequality might capture a mechanical correlation between the dependent and independent variables because redistribution is measured as the difference between prefiscal and postfiscal income. Thus, because of endogeneity concerns, one should interpret with caution the coefficients in Figure 11. The mechanical correlation disappears, however, when the dependent variable is replaced with social spending (as in Figure 12) or when the coefficient is derived from regressing a measure of net inequality on prefiscal inequality (as in Jantti, Pirttila, and Ronkko (2020)) or an instrumental variable (as in Niño-Zarazúa et al. (2023)). See Jantti, Pirttila, and Ronkko (2020) and Niño-Zarazúa et al. (2023) for a detailed discussion.

[36] Scartascini and Tommasi (forthcoming) present an interesting discussion of the political economy of fiscal redistribution. In their chapter, the authors present a framework to explain how the redistribution levels across the region are associated with different political configurations that align closely with the existence of multiple political economy equilibria.

dimension.

Fourth, regarding the impact of specific fiscal interventions, direct taxes and direct transfers are always equalizing. This result is unsurprising. Contrary to expectations, indirect taxes and subsidies are more frequently equalizing than unequalizing. There is evidence that the equalizing effect of indirect taxes may occur because poor households tend to buy in informal markets. In fact, Bachas, Gadenne, and Jensen (2020) study the redistributive capacity of indirect taxes on consumption goods in low- and middle-income countries and find that differences in informal consumption along the income distribution in these countries are linked to the progressivity of indirect taxes and, thus, of the fiscal systems.

The in-kind portion of the fiscal system (spending on education and health) is always equalizing too, and its contribution to the reduction in income inequality is rather large. This result is not surprising given that the use of government services is monetized at a value equal to the average government cost. While the results are encouraging from the equity point of view, it is important to note that they may be due to factors one would prefer to avoid. The more intensive use of services in education and health on the part of the poorer portions of the population, for example, may be caused by the fact that in their quest for quality, the middle classes and the rich chose to use private providers. This situation leaves the poor with access to second-rate services. In addition, if the middle classes and the rich opt out of public services, they may be much more reluctant to pay the taxes needed to improve both the coverage and the quality of services than they would be if services were used universally.

Fifth, fiscal redistribution is correlated with the size of resources devoted to redistribution. Countries with high (low) social spending show higher (lower) levels of fiscally-induced inequality reduction.

Sixth, in LAC countries, higher prefiscal inequality is *negatively* correlated with the amount of resources devoted to redistribution and the size of the redistributive effect. Although the coefficients are not statistically significant, these results suggest that the elites in LAC may be able to limit the redistributive role of the state.

One important aspect that has not been discussed so far is that a higher inequality- or poverty-reducing effect is not always a desirable outcome. Given the correlation between levels of spending and redistributive outcomes, it is quite possible that high redistributive effects are accompanied by strong disincentive effects and other inefficiencies, as well as unsustainable macroeconomic conditions. When focusing on the redistributive effects only, Argentina comes out as the top performer among LAC countries. Yet, as shown in the literature (and facts), Argentina's large redistributive state has many leakages and inefficiencies and has recurrently posed a threat to macroeconomic stability, growth, and the very sustainability of the redistributive effort (see Lustig and Pessino (2014) and Lopez del Valle et al. (2021b)).

There are a few lessons that emerge from our analysis. We start with those pertaining to the diagnostic of fiscal redistribution. The fact that specific fiscal interventions can have countervailing effects underscores the importance of taking a coordinated view of both taxation and spending rather than pursuing a piecemeal analysis. When combined with generous well-targeted transfers, efficient regressive taxes (such as the value-added tax) can result in a net fiscal system that is equalizing. Even more, because a net fiscal system with a regressive tax could be more equalizing than without it (also known as Lambert's conundrum), policy recommendations—such as eliminating the regressive tax—based on a piecemeal analysis could be flatly wrong.

An additional lesson on the diagnostic of fiscal redistribution that emerges is that it is crucial to measure the effect of taxation and spending not only on inequality but also on poverty to assess the impact of the fiscal system on people's standard of living because, as the case of some LAC countries, the net fiscal system can be equalizing but poverty-increasing.

Regarding policy prescriptions, one fundamental lesson is that governments should design their tax and transfers system so that the after taxes and transfers incomes of the poor are not lower than their incomes before fiscal interventions. The cash portion of the fiscal system should not impoverish the poor (or make the non-poor poor). The results indicate that, on average, the extremely poor in Honduras, Guatemala, and El Salvador, and the moderate poor in Bolivia, the Dominican Republic, Nicaragua, and Peru are net payers into the fiscal system. In the case of Peru, cash transfers are too small to compensate for what the poor pay in taxes. Furthermore, fiscal impoverishment can be quite pervasive and, in low-income countries, larger in magnitude than fiscal gains to the poor.

The current policy discussion (and the literature) focuses primarily on the power of fiscal policy to reduce income inequality and much less on the impact of fiscal policy on the standard of living of the poor. As suggested by Lustig (2018, 2022), if the policy community is seriously committed to eradicating income poverty, governments will need to explore ways to redesign taxation and transfers so that the poor do not end up as net payers.

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## Appendix

### A. The Theory of Fiscal Redistribution[37]

Lambert (2001) defines the redistributive effect as the difference between inequality for post-fiscal income and prefiscal income and shows that the redistributive effect of the net fiscal system is equal to the weighted sum of the redistributive effect of taxes and transfers. Where the redistributive effect of the tax system is defined as the difference between inequality of post-tax and prefiscal, the redistributive effect of the benefit system is defined as the difference between inequality of post-transfer income and prefiscal, and the weights are equal to the ratios of taxes and benefits divided by total prefiscal income, respectively.[38]

In mathematical terms:

$$RE_N = \frac{(1-g)RE_t + (1+b)RE_B}{1-g-b}$$

where $RE_N$, $RE_t$, and $RE_B$ are the change in the Gini indices for the net fiscal system, taxes (only) and benefits (only), respectively; and g and b are the total tax and benefit ratios—total taxes and total benefits divided by total prefiscal (original) income, respectively.[39]

This is the "fundamental equation of the redistributive effect." It is a fundamental equation because it lies at the heart of two essential implications. The first implication is that to correctly estimate the redistributive effect of fiscal policy, it is essential to analyze taxes and benefits in tandem. The second implication is that whether a tax or a transfer exercises an equalizing or unequalizing force no longer only depends on the progressivity or regressivity of the intervention vis-à-vis prefiscal income.

From the fundamental equation, one can formally derive the key condition that must be fulfilled for a net fiscal system to be equalizing.

$$RE_t > -\frac{(1+b)}{(1-g)}RE_B$$

[37] This section is drawn from Lustig (2022).

[38] See Lambert (2001, equation 11.29, p. 277). This equation can be applied to the so-called S-Gini family of indicators of which the Gini coefficient is one particular case. For the description of S-Gini indicators see, for example, Duclos and Araar (2006). Other inequality indicators cannot necessarily be neatly decomposed into a weighted sum of the redistributive effect of taxes and transfers.

[39] Actually, Lambert's formulation measures the redistributive effect with the Reynolds-Smolensky index, which in the absence of reranking of households (that is, when households occupy the same place in the ranking from poorest to richest whether they are ranked by prefiscal income or by postfiscal income) equals the difference between the prefiscal and postfiscal Gini coefficient. For a formal definition of the Reynolds-Smolensky index, see Duclos and Araar (2006).

This condition shows, for example, how taxes could be unequalizing $RE_t < 0$, but that given the ratios of taxes g and transfers b and the equalizing effect of transfers $RE_B > 0$, the unequalizing effect of taxes would be more than compensated.

In addition, the fundamental equation can also be used to show that relying on the typical indicators of progressivity such as the Kakwani index (Kakwani, 1977) to predict whether a tax or a transfer will exert an equalizing effect is wrong. Taxes, for instance, can be regressive according to the Kakwani index, but when combined with transfers (or, with other taxes), they can make the system more equalizing than without the regressive taxes. This startling result, first identified by Lambert (1995 and 2001), has been largely ignored in applied fiscal incidence analysis.

This result, also known as the Lambert's conundrum, is not equivalent to the well-known result we mentioned above: that efficient regressive taxes can be fine as long as, when combined with transfers, the net fiscal system is equalizing.[40] The surprising aspect of Lambert's conundrum is that a net fiscal system with a regressive tax (vis-à-vis prefiscal income) is more equalizing than without it.[41] The implications of Lambert's conundrum in real fiscal systems are quite profound: in order to determine whether a particular intervention (or a particular policy change) is inequality increasing or inequality reducing—and by how much—one must resort to numerical calculations that include the whole system. As Lambert (2001) mentions, the conundrum is "not altogether farfetched." Two renowned studies in the 1980s found this type of result for the United States and the United Kingdom (O'Higgins and Ruggles, 1981; Ruggles and O'Higgins, 1981). Also, this was the case of VAT for Chile (Martinez-Aguilar et al., 2018). The counterintuitive result embedded in Lambert's conundrum is the consequence of path dependency: a particular tax can be regressive vis-à-vis Market Income but progressive vis-à-vis the income that would prevail if all the other fiscal interventions were already in place.[42]

Given path dependency, how should one calculate the sign and order of magnitude of a

[40] As Higgins and Lustig (2016) mention, efficient taxes that fall disproportionately on the poor, such as a no-exemption value added tax, are often justified with the argument that 'spending instruments are available that are better targeted to the pursuit of equity concerns' (Keen and Lockwood, 2010, p. 141). Similarly, Engel et al. (1999, p. 186) assert that 'it is quite obvious that the disadvantages of a proportional tax are moderated by adequate targeting' of transfers, since 'what the poor individual pays in taxes is returned to her.' Ebrill, Keen, and Summers (2001, p. 105) argue that "a regressive tax might conceivably be the best way to finance pro-poor expenditures, with the net effect being to relieve poverty."

[41] It can also be shown that if there is reranking, a pervasive feature of net tax systems in the real world, making a tax (or a transfer) more progressive can *increase* post-tax and transfers inequality. In Lambert's example, regressive taxes not only enhance the equalizing effect of transfers, but making taxes more progressive (that is, more disproportional in the Kakwani sense) would result in higher(!) inequality; any additional change (toward more progressivity) in taxes or transfers would just cause reranking and an increase in inequality.

[42] See the discussion on path dependency in chapter 7 of Duclos and Araar (2006). As shown in chapter 2 in Lustig (2018), there are other counterintuitive results; for instance, adding a regressive transfer to a system with an existing regressive transfer could reduce inequality by more than if one does not add the new regressive transfer.

particular tax's or transfer's influence on the redistributive effect? There are several ways of calculating the contribution of a particular fiscal intervention to the change in inequality (or poverty). The most commonly used in the literature is the sequential contribution. The sequential contribution is calculated as the difference between inequality indicators with fiscal interventions ordered in a path according to their presumed institutional design.[43] For example, if direct transfers are subject to taxation, the sequential contribution of personal income taxes is the difference between Gross Income (Market Income plus transfers), on the one hand, and Disposable Income (Market Income plus transfers minus personal income taxes), on the other.

However, while it may be easy to identify based on institutional design a certain hierarchy for some taxes and transfers in the income construction tree, it will be difficult for others. To assume that Market Income plus (taxable) transfers—that is, Gross Income—occurs before (i.e., should come first in the hierarchical sequence) direct taxes seems quite reasonable. However, in which place of the hierarchy do the benefits derived from access to public education and health services belong? While here we define income concepts following a particular accounting framework and place education benefits (together with health benefits) at the end of the accounting exercise, this does not mean that we think that this sequence responds to a particular institutional design.

If it is not possible to establish a precise hierarchy or sequence in the income construction tree according to a particular institutional design, then the contribution to fiscal redistribution of the taxes and transfers for which establishing a hierarchy is not feasible is path dependent: that is, there will be as many contributions as the possibilities to place the tax or the transfer of interest in a sequence. For instance, the contribution of benefits from public education could be calculated by comparing the change in inequality it induces vis-à-vis Market Income inequality, Gross Income inequality, or Disposable Income inequality. Each one would be equally valid because education benefits do not depend on any of these income concepts but on whether the household has school-aged children. The size of the contribution of this benefit will be different for each path.

Given path dependency, the result obtained by the sequential method can thus be wrong. In theory, path dependency would require measuring the total average contribution by considering all the possible paths and taking, for example, the so-called Shapley value (used in game theory)[44] or applying methods that combine the sequential and Shapley-value approaches where the latter is applied on the subset of fiscal interventions for which an institutionally defined hierarchical path cannot be determined.[45] Applying the latter is complex, and results are sensitive to the assumptions made about the hierarchy of interventions. A sensible alternative is to use what in the statistical literature is known as the marginal contribution. In our context, the marginal contribution of a tax (or transfer) is calculated by taking the difference between the inequality (or poverty) indicator

[43] OECD (2011) used this method, for example.
[44] For an analysis of the Shapley value and its properties, see, for example, Shorrocks (2013).
[45] See, for example, Sastre and Trannoy (2002) and Sastre and Trannoy (2008).

without the tax (or transfer) and with it.[46] For example, the marginal contribution of direct taxes is the difference between the Gini for Gross Income (Market Income plus transfers) and the Gini for Disposable Income (Market Income plus transfers minus direct taxes).[47]

The marginal contribution has a straightforward policy interpretation because it is equivalent to asking the question: would inequality be higher, the same, or lower with the tax (or transfer) than without it? It is important to note as well that the notion of marginal contribution is general. That is, it can be applied not only to any inequality indicator but to poverty indicators as well. The basic issue is always the same: one must compare the size of the indicator without the fiscal instrument in place with the indicator that does include the latter. One drawback of the marginal contribution in the context of inequality measures is that it does not satisfy the aggregation principle: that is, the sum of the marginal contributions of all the taxes and transfers will not equal—except by accident—the total redistributive effect. At this point, we are ready to give up the aggregation principle in exchange for always obtaining the correct answer as to whether a tax or a transfer exerts an equalizing or unequalizing influence.

**Implications of Reranking**

Reranking refers to the phenomenon whereby fiscal interventions arbitrarily alter the relative position of individuals (or households) across the distribution. In other words, reranking occurs if individual A was poorer than individual B before a fiscal intervention, but B is poorer than A after the intervention. The definition of horizontal equity postulates that the prefiscal policy income ranking should be preserved (Duclos and Araar, 2006). In other words, if individual A was poorer than individual B before the fiscal interventions, individual A should continue to be poorer than individual B after the interventions.

Enami (2018) shows how conditions are affected if taxes and transfers rerank households. It is important to note that if there is reranking, the fundamental equation can no longer be interpreted as a measure of the fiscally induced change in inequality. To illustrate, let's think of the hypothetical case in which taxes and transfers cause extreme reranking: that is, households switch places in such a way that the prefiscal richest becomes the postfiscal poorest, the second prefiscal richest becomes the second postfiscal poorest, and so on. In such a situation, the change in inequality will be zero. However, the redistributive effect will be positive and equal to the weighted sum described above, but where $RE_N$, $RE_t$, and $RE_B$ are the Reynolds-Smolensky indices for the net fiscal system,

[46] The *marginal contribution* should not be confused with the *marginal incidence*, the latter being the incidence of a small change in spending. Note that, because of path dependency, adding up the marginal contributions of each intervention will not be equal to the total change in inequality. Clearly, adding up the sequential contributions will not equal the total change in inequality either. An approach that has been suggested to calculate the contribution of each intervention in such a way that they add up to the total change in inequality is to use the Shapley value. The studies analyzed here do not have estimates for the latter.

[47] Note that if certain fiscal interventions come in bundles (for example, a tax that kicks in only if a certain transfer is in place), the marginal contribution can be calculated for the net tax (or the net benefit) in question.

taxes (only) and benefits (only), respectively.[48]

In other words, reranking introduces the equivalent of a "wildcard": the only way to know if the net fiscal system is equalizing or not is by empirical estimation. One cannot predict whether a net fiscal system is equalizing by relying on the size and progressivity of taxes and transfers. Most, if not all, fiscal systems in real life feature some degree of reranking of households. The order of magnitude can vary; below we present an indicator to measure reranking. Reranking is interpreted as a measure of fiscally induced horizontal inequality (Duclos and Araar, 2006). The more reranking there is, the more horizontal inequity.

If there is reranking, in order to determine whether a particular intervention (or a particular policy change) is inequality increasing or inequality reducing—and by how much—one must resort to numerical calculations that include the full set of components of the fiscal system being analyzed. In particular, one must calculate the inequality indicator that would prevail with and without the specific intervention (or policy change).[49]

Therefore, indices that rely on concentration measures that use prefiscal income as a classifier, such as the Kakwani index of progressivity, can mathematically produce sign-inconsistent cases in the presence of reranking and/or the Lambert's conundrum.[50] While it is mathematically possible for a component of fiscal policy to be progressive (regressive) based on the Kakwani index yet unequalizing (equalizing), how frequently does this occur in actual fiscal systems? Enami, Lustig, and Larroulet (2022) show, for a sample of 39 countries obtained from the CEQ Institute Data Center, that for everything but indirect taxes the risk of a Kakwani index yielding a misleading result is minimal.

[48] In fact, in the presence of reranking the fundamental equation measures the change induced to what in the literature Is often called vertical equity. Reranking is considered a form of horizontal inequity. See, for example, Duclos and Araar (2006).

[49] The same applies to poverty indicators or any other indicator of interest. The difficulties are compounded when one wants to compare the impact of net fiscal systems across countries because the original distributions (that is, the income distribution before taxes and transfers) differ. For a discussion comparing systems when the original distribution must be taken into account, see Lambert (2001) and Duclos and Araar (2006).

[50] This sign-inconsistency can occur with other indices of progressivity that rely on concentration measures that use prefiscal income as the classifier such as the Suits and the Reynolds-Smolensky indexes.

## B. Data

TABLE B1 – Household Surveys, LAC Countries

| Country | Year(s) | Household Survey | CEQ Assessment Source |
|---|---|---|---|
| Argentina | 2017 | Encuesta Permanente de Hogares | Lopez del Valle et al. (2021a) |
| Bolivia | 2015 | Encuesta de Hogares | Paz Arauco, Jimenez, and Yañez (2020) |
| Brazil | 2018 | Pesquisa de Orçamentos Familiares | Pereira et al. (2022) |
| Chile | 2013 | Encuesta de Caracterización Socioeconómica Nacional | Martinez-Aguilar (2020a) |
| Colombia | 2014 | Encuesta Nacional de Calidad de Vida | Melendez and Martinez Pabon (2019b) |
| Costa Rica | 2018 | Encuesta Nacional de Hogares | Cabrera and Feoli (2023) |
| Dominican Republic | 2013 | Encuesta Nacional de Ingresos y Gastos de los Hogares | Aristy-Escuder (2019) |
| Ecuador | 2011 | Encuesta Nacional de Ingresos y Gastos de los Hogares | Llerena Pinto et al. (2020) |
| El Salvador | 2017 | Encuesta de Hogares y Propósitos Múltiples | Oliva (2020d) |
| Guatemala | 2014 | Encuesta Nacional de Condiciones de Vida | Cabrera and Moran (2020a) |
| Honduras | 2011 | Encuesta Permanente de Hogares de Propositos Multiples | Espino (2020) |
| Mexico | 2014 | Encuesta Nacional de Ingresos y Gastos de los Hogares | Scott et al. (2020b) |
| Nicaragua | 2009 | Encuesta Nacional de Medicion de Nivel de Vida | Cabrera and Moran (2020b) |
| Panama | 2016 | Encuesta de Propósitos Múltiples | Martinez-Aguilar (2020b) |
| Paraguay | 2019 | Encuesta Permanente de Hogares | Molinas and Gonzalez (2023) |
| Peru | 2011 | Encuesta Nacional de Hogares | Jaramillo (2020) |
| Uruguay | 2019 | Encuesta Continua de Hogares | Bucheli, Amarante, and Colafranceschi (2022) |
| Venezuela | 2013 | Encuesta Nacional de Hogares por Muestreo | Molina (2020) |

## TABLE B2 – Household Surveys, Non-LAC Countries

| Country | Year(s) | Household Survey | CEQ Assessment Source |
|---|---|---|---|
| Albania | 2015 | Household Budget Survey | Data was sourced from the publication derived from this assessment: Davalos et al. (2018) |
| Armenia | 2011 | Integrated Living Conditions Survey | Younger et al. (2019) |
| Belarus | 2015 | Household Budget Survey (HBS) | Data was sourced from the publication derived from this assessment: Bornukova, Shymanovich, and Chubrik (2017) |
| Botswana | 2010 | Botswana Core Welfare Indicators Survey | Houts and Younger (2020) |
| Burkina Faso | 2014 | Enquête Multisectorielle Continue | Data was sourced from the publication derived from this assessment: World Bank (2018) |
| China | 2014 | China Family Panel Studies | Wang (2020) |
| Comoros | 2014 | Expenditure household consumer spending | Jellema (2020a) |
| Croatia | 2014 | Croatian Household Budget Survey | Data was sourced from the publication derived from this assessment: Inchauste and Rubil (2017) |
| Egypt | 2015 | Household Income, Expenditure, and Consumption Survey | Data was sourced from the publication derived from this assessment: Ibarra et al. (2019) |
| eSwatini | 2017 | Swaziland Household Income and Expenditure Survey | Habib, Goldman, and Renda (2020) |
| Ethiopia | 2010 | Household Consumption Expediture Survey | Hill, Tsehaye, and Woldehanna (2014). |
| Georgia | 2013 | Integrated Household Survey | Cancho and Bondarenko (2015) |
| Ghana | 2012 | Living Standards Survey, Round 6 | Younger, Osei-Assibey, and Oppong (2018) |
| Guinea | 2012 | Enquête Légère pour l'Evaluation de la Pauvreté | Data was sourced from the publication derived from this assessment: Batana et al. (2019) |
| India | 2011 | National Sample Survey, 68th round | Khundu and Cabrera (2020) |
| Indonesia | 2012 | National Socioeconomic Survey | Afkar, Jellema, and Wai-Poi (2015) |
| Iran | 2011 | Iranian Urban/Rural Household Income and Expenditure Survey | Enami, Lustig, and Taqdiri (2017) |
| Ivory Coast | 2015 | Enquete sur le niveau de vie des menages en Cote d'Ivoire | Jellema (2020b) |
| Jordan | 2010 | Household Expenditure and Income Survey | Abdel-Halim et al. (2016) |
| Kenya | 2015 | Integrated Household Budget Survey | Manda et al. (2019) |
| Lesotho | 2017 | Lesotho Multipurpose Household Survey | Houts and Massara (2020) |
| Mali | 2014 | Enquête Agricole de Conjoncture Intégrée | Data was sourced from the publication derived from this assessment: Hounsa, Coulibaly, and Sanoh (2019) |
| Mongolia | 2016 | Mongolia's Household Socio Economic Survey | Data was sourced from the publication derived from this assessment: Freije-Rodriguez and Yang (2018) |
| Namibia | 2016 | Namibia Household Income and Expenditure Survey | Jellema and Goldman (2020) |
| Niger | 2014 | Enquête nationale sur les Conditions de Vie des Ménages et Agriculture | Data was sourced from the publication derived from this assessment: Hounsa, Coulibaly, and Sanoh (2019) |
| Poland | 2014 | Polish Household Budget Survey | Data was sourced from the publication derived from this assessment: Goraus and Inchauste (2016) |
| Romania | 2016 | Romanian Household Budget Survey (HBS) | Data was sourced from the publication derived from this assessment: Inchauste and Militaru (2018) |
| Russia | 2010 | Longitudinal Monitoring Survey of Higher School of Economics | Popova (2019) |
| South Africa | 2015 | Income and Expenditure Survey | Goldman and Woolard (2020) |
| Spain | 2017 | Encuesta de Condiciones de Vida | Gomez Bengoechea and Quan (2020) |
| Sri Lanka | 2009 | Household Income and Expenditure Survey | Arunatilake, Jayawardena, and Abayasekara (2019) |
| Tajikistan | 2015 | Tajikistan 2015 Household Budget Survey | Dalmacio et al (2017) |
| Tanzania | 2011 | Household Budget Survey | Younger, Myamba, and Mdadila (2019) |
| Togo | 2015 | QUIBB | Jellema and Tassot (2020) |
| Tunisia | 2010 | National Survey on Household Budget, Consumption and Standard of Living | Jouini (2020) |
| Turkey | 2014 | Household Budget Survey | Caglayan (2020) |
| Uganda | 2016 | Uganda National Household Survey | Deisy et al. (2020) |
| Ukraine | 2016 | Household Living Conditions Survey (HLCS) | Bornukova, Leshchenko, and Matytsin (2019) |
| United States | 2016 | Current Population Survey | Carrera, Li, and Renda (2019) |
| Zambia | 2015 | Zambia Living Conditions Monitoring Survey VII | Jellema et al. (2020) |

TABLE B3 – Allocation Methods of Fiscal Policy Instruments

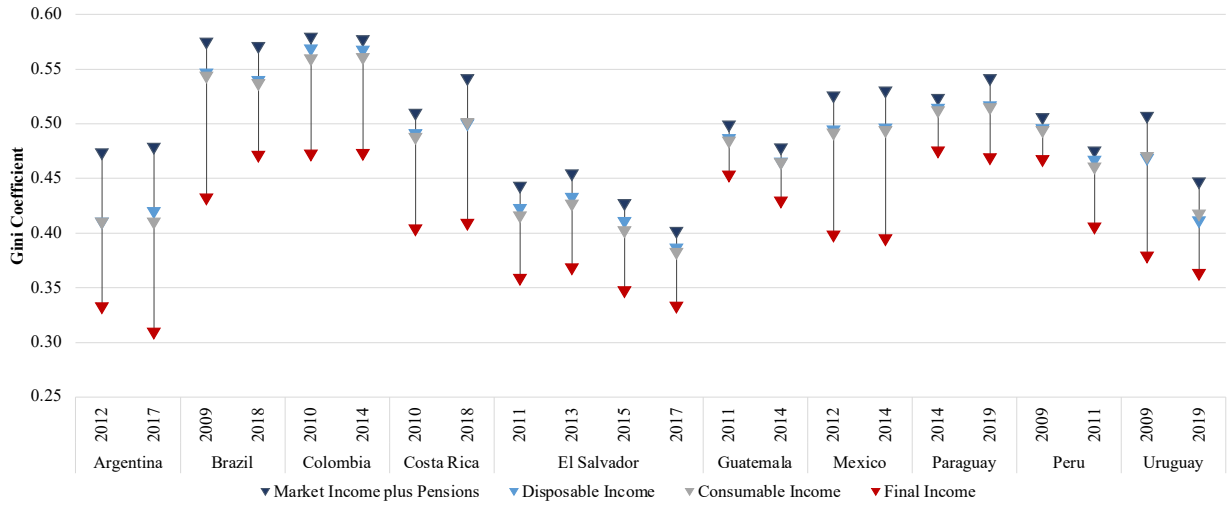
| | | | Allocation method | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Country | Year | Variable in survey | Contributory pensions | Direct taxes | Direct transfers | Indirect taxes (effective/statutory rates) (correction for informality) | Indirect subsidies | Education | Health |
| Argentina | 2017 | Market income | DI | Other | Simulation & imputation | Simulation & other (both) (yes) | Imputation | Imputation | Other |
| Bolivia | 2015 | Net market income | Inferred | Not included | DI & imputation | Imputation & secondary source (effective) (yes) | Imputation | Imputation | DI & imputation |
| Brazil | 2018 | Market income | DI | DI | DI & inferred | Simulation (effective) (yes) | Simulation | Imputation | Imputation |
| Chile | 2013 | Net market income | DI | Simulation | DI & imputation | Secondary source (effective) (yes) | DI & simulation | Simulation & imputation | Imputation |
| Colombia | 2014 | Market income | DI | DI | DI | DI & imputation (statutory) (yes) | Imputation | Imputation | Imputation |
| Costa Rica | 2018 | Market income | DI | DI & simulation | DI & imputation | Simulation (effective) (no) | Not included | Imputation | Imputation |
| Dominican Republic | 2013 | Market income | Imputation | Simulation | Imputation | Simulation & imputation (effective) (yes) | Simulation | Imputation | Imputation |
| Ecuador | 2011 | Market income | DI | DI & simulation | DI & imputation | Imputation (statutory) (no) | Imputation | Imputation | Secondary source |
| El Salvador | 2017 | Market income | DI | Simulation | DI & imputation | Simulation & imputation (effective) (yes) | Imputation | Imputation | Imputation |
| Guatemala | 2014 | Market income | DI & inferred | Simulation | DI & imputation & simulation | Simulation (effective) (yes) | Simulation | Imputation | Imputation |
| Honduras | 2011 | Market income | DI | Imputation | DI & simulation | Simulation (statutory) (no) | DI & imputation | Imputation | Imputation |
| Mexico | 2014 | Net market income | DI | Imputation | DI & imputation | Simulation (effective) (yes) | Imputation | Imputation | Imputation |
| Nicaragua | 2009 | Market income | DI | Simulation | Imputation | Simulation (effective) (yes) | Simulation & imputation | Imputation | Imputation |
| Panama | 2016 | Market income | DI | Simulation & imputation | DI | Imputation (both) (yes) | Simulation & imputation | Imputation | Imputation |
| Paraguay | 2019 | Net market income | DI | DI & imputation | DI & imputation & simulation | Imputation (effective) (yes) | Simulation & imputation | Imputation | DI & imputation |
| Peru | 2011 | Market income | DI | DI | DI | Imputation (effective) (yes) | Not included | Imputation | Imputation |
| Uruguay | 2019 | Disposable income | DI & imputation | Simulation | DI | Other (statutory) (no) | Not included | Simulation & imputation | Imputation |
| Venezuela | 2013 | Disposable income | DI | Simulation | DI | Imputation (effective) (no) | DI & imputation | Imputation | Imputation |

Source: CEQ Metadata Table (publicly available at: https://commitmentoequity.org/datacenter).
Notes: Direct identification (DI) is used when the survey reports if household received cash transfers or paid taxes and how much they received or paid. Inference is used when is possible to infer which household received cash transfers based on information reported in other income sources. Imputation is used when beneficiaries or payers are directly identified in the survey, but the survey does not ask for the amount received or paid. Simulation is used when both the information on beneficiaries (payers) and benefits (taxes paid) is absent from the survey. A secondary source is used as a last resort.

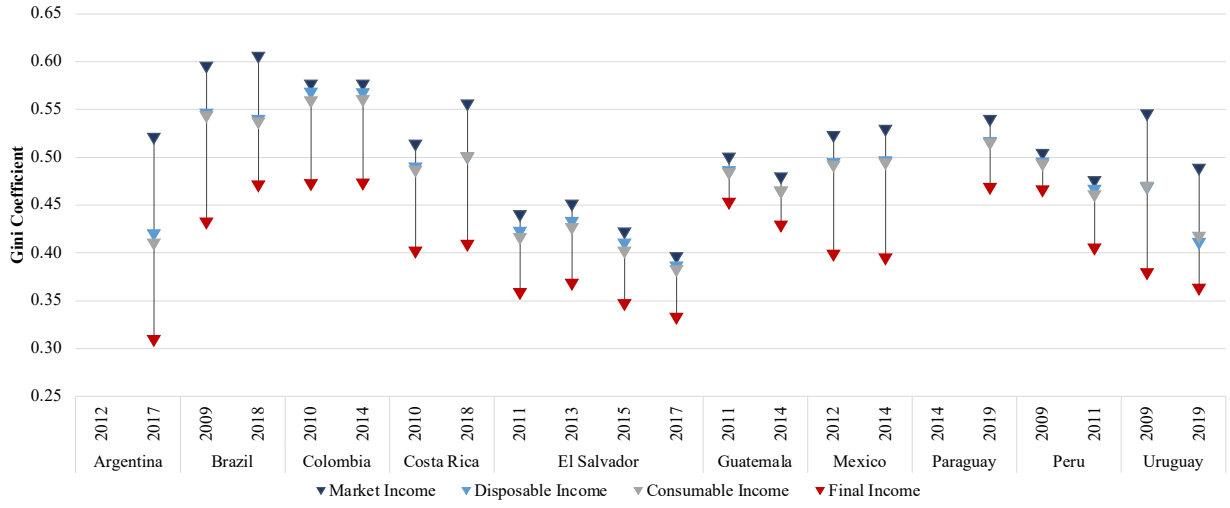
## C. Supplementary Figures and Tables

FIGURE C1 – Income Inequality Over Time: Gini Coefficient for Market, Disposable, Consumable, and Final Income

Panel (A) Contributory Pensions as Deferred Income (PDI Scenario)



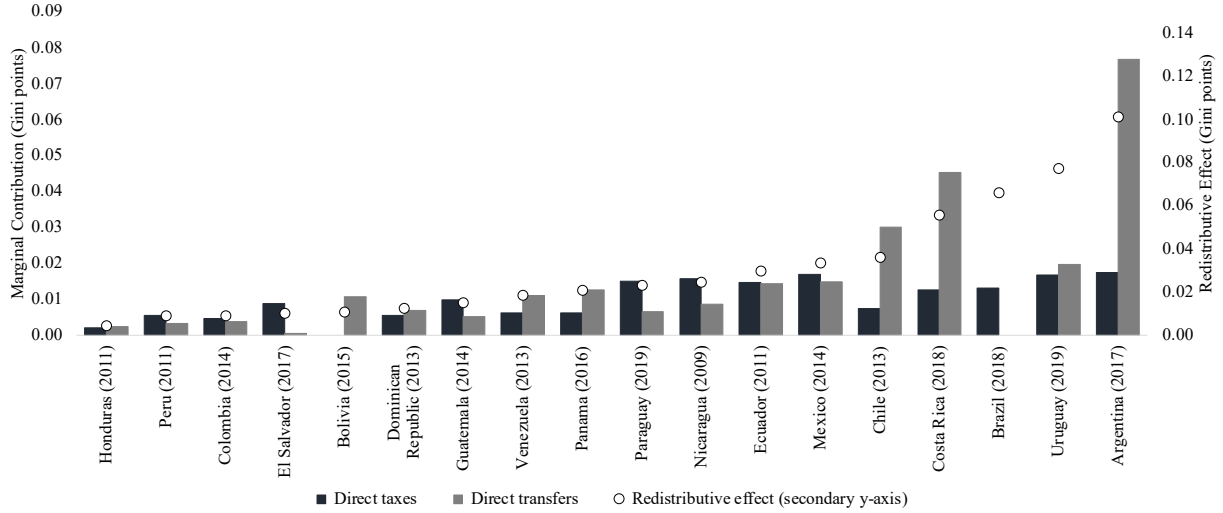

Panel (B) Contributory Pensions as Government Transfer (PGT Scenario)



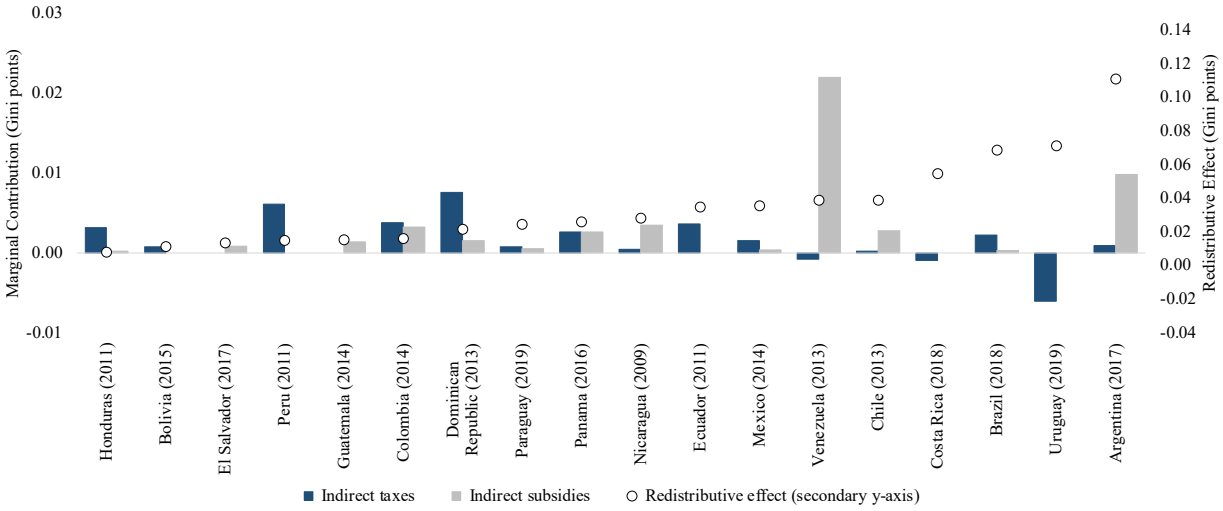

Source: Argentina (Rossignolo, 2020; Lopez del Valle et al., 2021a); Brazil (Higgins, Pereira, and Cabrera, 2020; Pereira et al., 2022); Colombia (Melendez and Martinez Pabon, 2019a, 2019b); Costa Rica (Sauma and Trejos, 2014; Cabrera and Feoli, 2023); El Salvador (Oliva, 2020a, 2020b, 2020c, 2020d); Guatemala (Cabrera, 2019; Cabrera and Moran, 2020a); Mexico (Scott et al., 2020a, 2020b); Paraguay (Gimenez et al., 2017; Molinas and Gonzalez, 2023); Peru (Jaramillo, 2015, 2020); Uruguay (Bucheli , 2019; Bucheli, Amarante, and Colafranceschi, 2022).
Notes: The year for which the analysis was conducted is in parenthesis.

FIGURE C2 - Marginal Contribution of Taxes and Transfers: Contributory Pensions as Government Transfer (PGT Scenario)

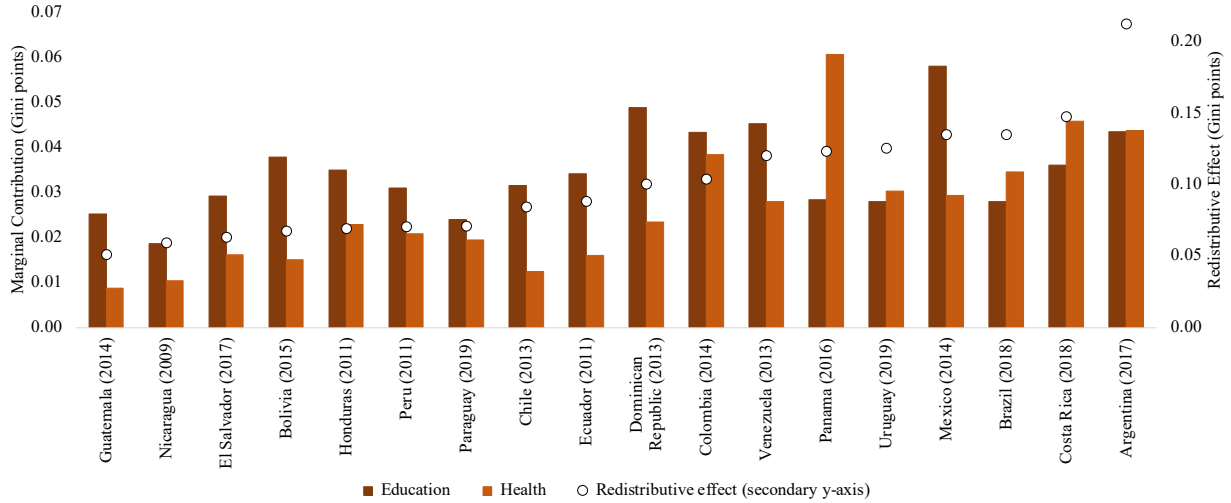
Panel (A) Direct Taxes and Transfers




Panel (B) Indirect Taxes and Subsidies

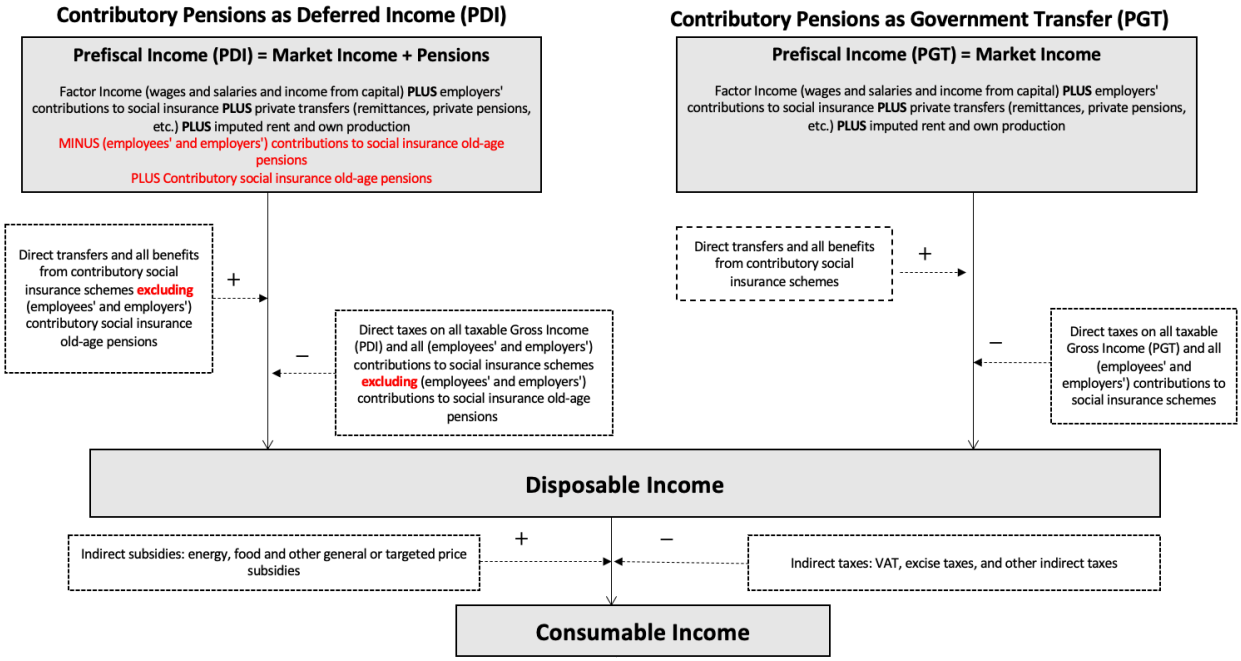


Panel (C) In-kind Transfers



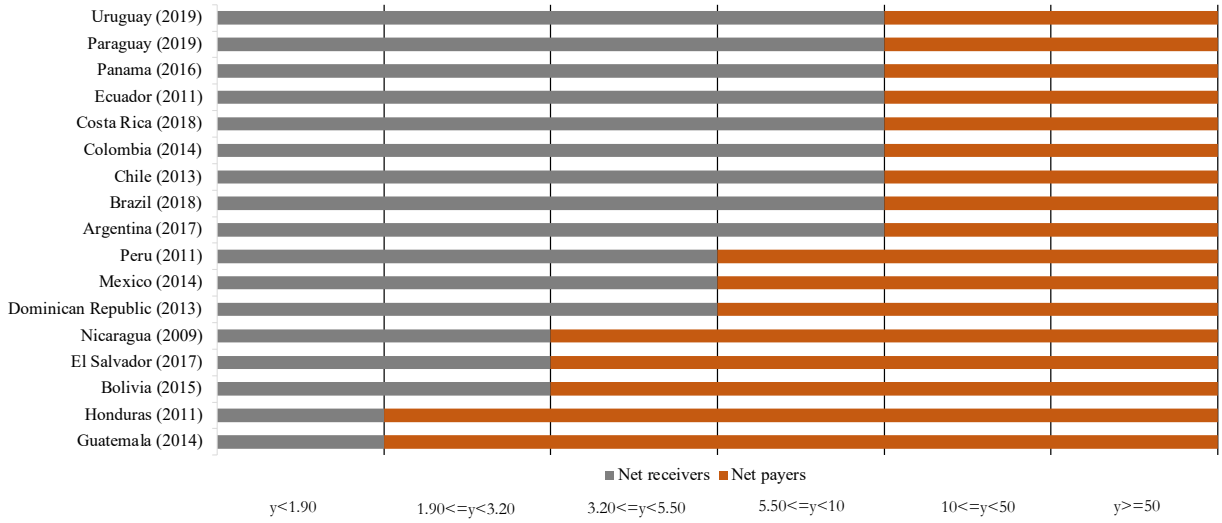

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).
Notes: The year for which the analysis was conducted is in parenthesis. The marginal contribution of direct taxes (transfers) is calculated as the difference between Gini of Disposable Income without and with direct taxes (transfers) (panel A). The marginal contribution of indirect taxes (subsidies) is calculated as the difference between Gini of Consumable Income without and with indirect taxes (subsidies) (panel B). The marginal contribution of education (health) transfers is calculated as the difference between Gini of Final Income without and with education (health) transfers (panel C). If the marginal contribution is positive (negative), the fiscal intervention of interest is equalizing (unequalizing). Redistributive effect of direct taxes and transfers is defined as the difference between Gini of Market Income plus Pensions and Gini of Disposable Income (panel A). Redistributive effect of indirect taxes and subsidies is defined as the difference between Gini of Market Income plus Pensions and Gini of Consumable Income (panel B). Redistributive effect of in-kind transfers is defined as the difference between Gini of Market Income plus Pensions and Gini of Final Income (panel C). The graph is ranked from the smallest to the largest by redistributive effect. Bolivia does not have direct taxes. Costa Rica and Uruguay do not have subsidies. The marginal contribution of indirect taxes (without indirect effects) is not available for Guatemala and El Salvador. The marginal contribution of subsidies (without indirect effects) is not available for Bolivia and Ecuador.

FIGURE C3 - Income Concepts for the Analysis of Poverty Measures under the Two Scenarios: Pensions as Deferred Income (PDI) and Pensions as Government Transfer (PGT)




Source: Lustig (2022).

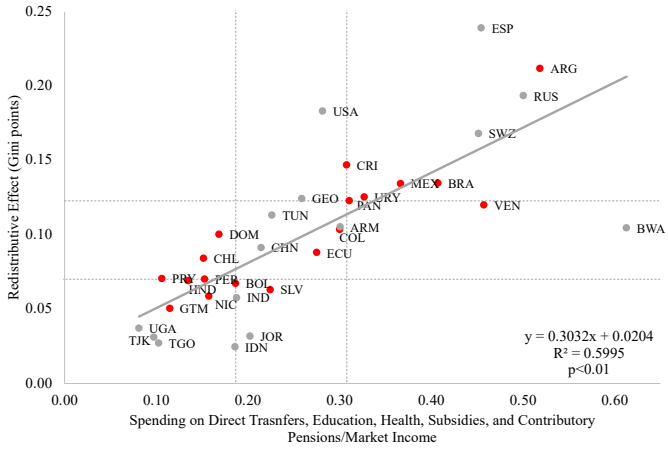
FIGURE C4 - Net Payers to the Fiscal System by Income Groups: Contributory Pensions as Government Transfer (PGT Scenario)



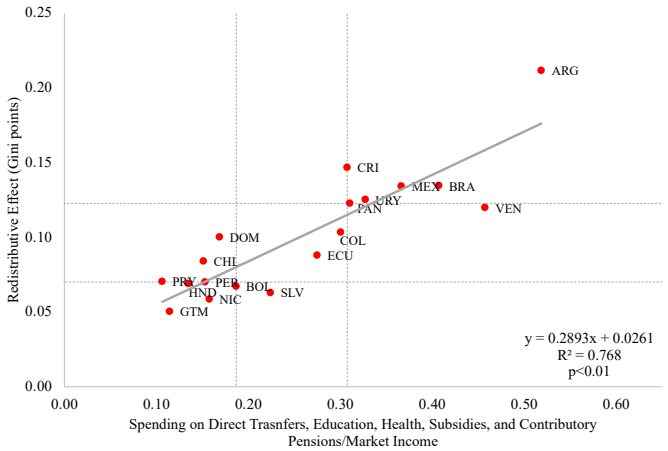

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).
Notes: The year for which the analysis was conducted is in parenthesis.

FIGURE C5 – Social Spending/Prefiscal Income and Redistributive Effect: Contributory Pensions as Government Transfer (PGT Scenario)

Panel (A) All Countries




Panel (B) LAC

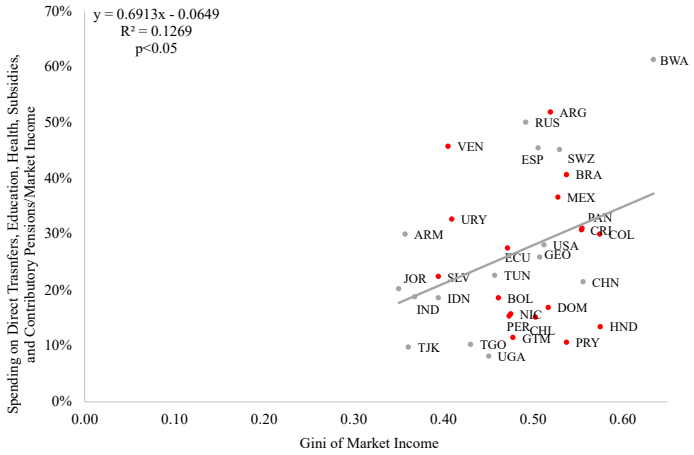



Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.

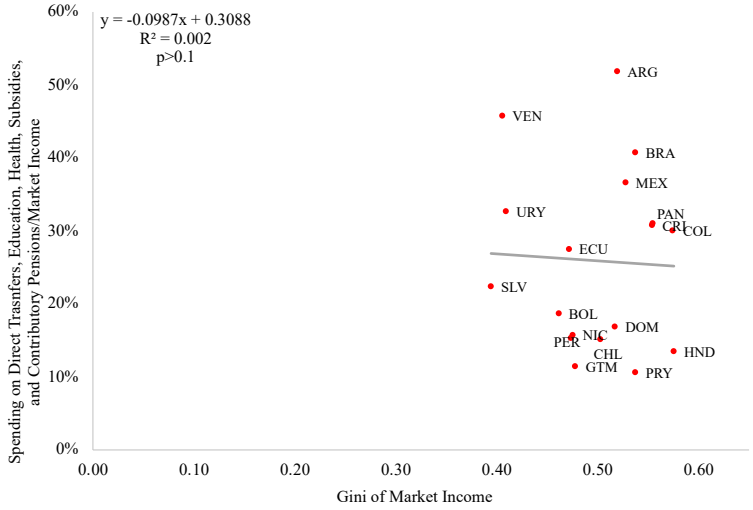
Notes: The dotted lines are the 1/3 and 2/3 percentiles of the variables when all countries are accounted for. The grey line is the slope obtained from a regression with the redistributive effect as dependent variable. Redistributive effect is defined as Gini of Market Income minus Gini of Final Income. LAC countries are marked in red and non-LAC countries are marked in grey. * $p < 0.1$, ** $p < 0.05$, ***$p < 0.01$.

FIGURE C6 – Prefiscal Inequality and Social Spending/Prefiscal Income: Contributory Pensions as Government Transfer (PGT Scenario)

Panel (A) All Countries




Panel (B) LAC

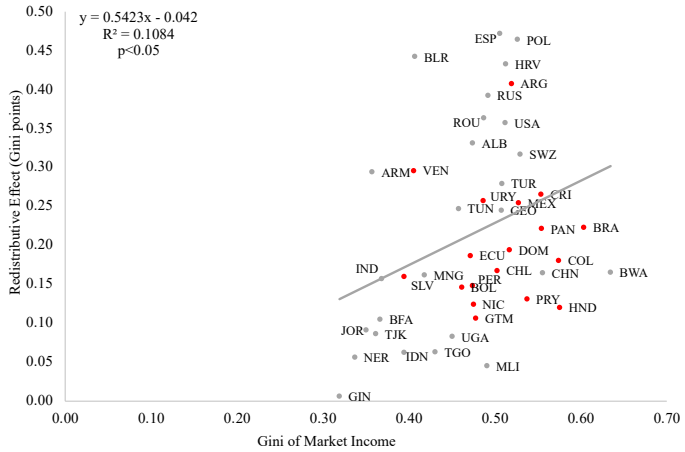



Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.

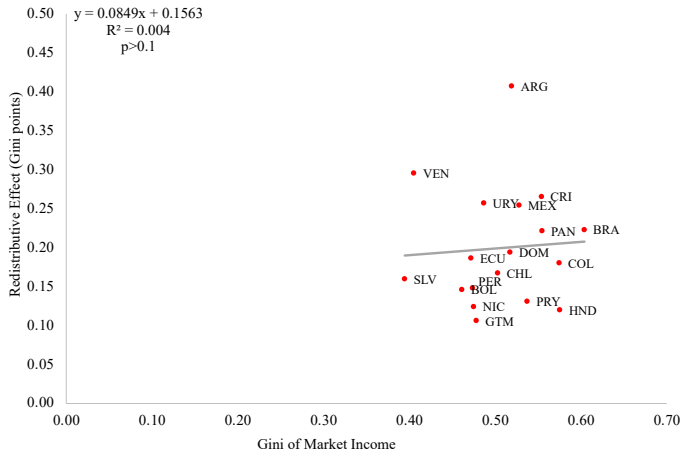
Notes: The grey line is the slope obtained from a regression with social spending plus subsidies/prefiscal income as dependent variable. Social spending includes direct transfers, spending on education and health, and other social spending. LAC countries are marked in red and non-LAC countries are marked in grey. * $p < 0.1$, ** $p < 0.05$, ***$p < 0.01$.

FIGURE C7 – Prefiscal Inequality and Fiscal Redistribution: Contributory Pensions as Government Transfer (PGT Scenario)

Panel (A) All Countries




Panel (B) LAC




Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020). See Table B2 in Appendix B for the source of non-LAC countries.

Notes: The grey line is the slope obtained from a regression with the redistributive effect as dependent variable. Redistributive effect is defined as Gini of Market Income minus Gini of Final Income. LAC countries are marked in red and non-LAC countries are marked in grey. * $p < 0.1$, ** $p < 0.05$, ***$p < 0.01$.

TABLE C1 - Progressivity and Pro-Poorness of Education and Health Spending: Contributory Pensions as Government Transfer (PGT Scenario)

| Country | Total Education | Pre-school | Primary | Secondary | Lower secondary | Upper secondary | Tertiary | Health |
|---|---|---|---|---|---|---|---|---|
| Argentina (2017) | A | A | A | A | | | C | B |
| Bolivia (2015) | A | A | A | A | | | C | C |
| Brazil (2018) | A | A | A | A | | | C | A |
| Chile (2013) | A | A | A | A | | | C | A |
| Colombia (2014) | A | A | A | | A | A | C | C |
| Costa Rica (2018) | A | A | A | A | | | C | C |
| Dominican Republic (2013) | A | A | A | | A | A | C | A |
| Ecuador (2011) | A | A | A | | A | A | C | B |
| El Salvador (2017) | A | A | A | | | B | C | C |
| Guatemala (2014) | A | A | A | | A | C | D | C |
| Honduras (2011) | B | A | A | | | | | A |
| Mexico (2014) | A | A | A | | A | B | C | C |
| Nicaragua (2009) | B | A | A | | B | B | C | C |
| Panama (2016) | A | A | A | A | | | C | A |
| Paraguay (2019) | A | A | A | A | | | C | A |
| Peru (2011) | A | A | A | A | | | C | B |
| Uruguay (2019) | A | A | A | | A | A | C | A |
| Venezuela (2013) | A | A | A | A | | | B | A |

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).
Notes: The year for which the analysis was conducted is in parenthesis. [A] Pro-poor, concentration coefficient is negative. [B] Neutral, concentration coefficient equals zero. [C] Progressive, concentration coefficient is positive but lower than Gini of prefiscal income. [D] Regressive, concentration coefficient is positive and higher than Gini of prefiscal income.

TABLE C2 – LAC: Spending on Direct Transfers, Education, Health, and Subsidies/Prefiscal Income by Country Category

| Category | | | Contributory Pensions as Deferred Income (PDI Scenario) | | | | | Contributory Pensions as Government Transfer (PGT Scenario) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Redistributive effect | | Spending | Countries | Spending on direct transfes/ Market Income plus Pensions | Spending on education/ Market Income plus Pensions | Spending on health/ Market Income plus Pensions | Spending on subsidies/ Market Income plus Pensions | Countries | Spending on direct transfes/ Market Income | Spending on education/ Market Income | Spending on health/ Market Income | Spending on subsidies/ Market Income |
| High | - | High | ARG, CRI, MEX, VEN | 4.2% | 12.4% | 10.5% | 6.5% | ARG, BRA, CRI, MEX, PAN, URY | 14.5% | 9.6% | 11.1% | 1.9% |
| High | - | Medium | COL, PAN | 1.5% | 6.4% | 12.1% | 0.9% | | n.a. | n.a. | n.a. | n.a. |
| High | - | Low | | n.a. | n.a. | n.a. | n.a. | | n.a. | n.a. | n.a. | n.a. |
| Medium | - | High | BRA, ECU | 3.6% | 8.1% | 7.5% | 4.2% | VEN | 7.5% | 15.5% | 9.6% | 13.2% |
| Medium | - | Medium | DOM, SLV, URY | 1.7% | 7.9% | 6.9% | 1.4% | COL, ECU | 7.2% | 7.9% | 8.9% | 4.7% |
| Medium | - | Low | CHL, HND, PRY, PER | 1.1% | 5.3% | 4.2% | 0.3% | CHL, DOM, PRY | 3.0% | 6.2% | 3.5% | 0.7% |
| Low | - | High | | n.a. | n.a. | n.a. | n.a. | | n.a. | n.a. | n.a. | n.a. |
| Low | - | Medium | BOL, NIC | 1.9% | 6.9% | 5.5% | 1.6% | SLV | 4.3% | 6.7% | 9.5% | 2.0% |
| Low | - | Low | GTM | 1.0% | 4.9% | 4.5% | 0.7% | BOL, GTM, HND, PER, NIC | 2.5% | 6.3% | 5.3% | 1.0% |
| | | | All LAC countries | 2.3% | 7.9% | 7.6% | 2.5% | All LAC countries | 7.5% | 8.1% | 7.8% | 2.6% |

Source: Argentina (Lopez del Valle et al., 2021a); Bolivia (Paz Arauco, Jimenez, and Yañez, 2020); Brazil (Pereira et al., 2022); Chile (Martinez-Aguilar, 2020a); Colombia (Melendez and Martinez Pabon, 2019b); Costa Rica (Cabrera and Feoli, 2023); Dominican Republic (Aristy-Escuder, 2019); Ecuador (Llerena Pinto et al., 2020); El Salvador (Oliva, 2020d); Guatemala (Cabrera and Moran, 2020a); Honduras (Espino, 2020); Mexico (Scott et al., 2020b); Nicaragua (Cabrera and Moran, 2020b); Panama (Martinez-Aguilar, 2020b); Paraguay (Molinas and Gonzalez, 2023); Peru (Jaramillo, 2020); Uruguay (Bucheli, Amarante, and Colafranceschi, 2022); and Venezuela (Molina, 2020).

Notes: Country category based on Figures 10 and C5. Redistributive effect category based on redistributive effect defined as the difference between Gini of prefiscal income and Gini of Final Income. Spending category based on resources devoted to direct transfers, education, health, and subsidies/Prefiscal Income in the PDI scenario and on resources devoted to direct transfers, education, health, subsidies, and contributory pensions/Prefiscal Income in the PGT scenario.