

# Income redistribution in Latin America: tax-benefit microsimulation approach <sup>1</sup>

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## Abstract

We analyse the effect of taxes and benefits on income distribution of six Latin American countries: Argentina, Bolivia, Colombia, Ecuador, Paraguay and Venezuela. Our analysis makes use of tax-benefit microsimulation models based on harmonized household representative survey data and developed within the structure of EUROMOD. The analysis focuses on the relative importance of tax-benefit instruments across countries and on the effect of taxes and benefits on poverty and inequality. The selected countries represent a wide range of cases in terms of the redistributive role of the tax-benefit system with Argentina providing a large degree of redistribution, whereas the Bolivian system has a very modest role. We further exploit the advantages of our models and perform a simulation exercise whereby the most progressive income tax system of our set of countries is applied to the rest and assess its effect on inequality. Our paper represents the first study making use of microsimulation techniques to assess the redistributive role of tax-benefit systems in the region in a comparable manner, and highlights the advantages offered by microsimulation models to evaluate the effect of policy reforms aiming to improve social protection in the region.

**JEL:** I32, I38, H24, D13

**KEYWORDS:** taxes, benefits, microsimulation, Latin America

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## 1. Introduction

Latin America is one of the most unequal regions in the world and the fiscal system shows modest results in reducing income inequality. According to Lustig, tax benefit systems in Latin America decrease the Gini coefficient by 2.7 points, on average, when market income is compared to disposable income for the year 2011; while it does by around 20.9 points on average in European countries. This modest redistributive role in Latin America can be explained, among others, by: a) the modest size of tax systems, despite their growth in recent decades (raising, on average from 13.2% of GDP in 1990 to 21% of GDP in 2014) (Gómez Sabaini et al 2017); b) the composition of the tax systems, with a high participation of indirect taxes (51.7% in 2014 in LAC countries, in contrast to 32.9% in OECD countries) (Gómez Sabaini et al 2017) and, even, a weak design of the most progressive taxes. Around 2010, personal income tax in LAC countries represented only 29% of total income tax revenue, compared to 74% in OECD countries (Gómez Sabaini et al 2017); and c) social spending has also increased, mainly because of conditional cash transfers to the population with the lowest income, but remains lower than in the OECD countries. To design reforms to improve the redistributive impact of the tax and social protection systems, it is necessary to evaluate the fiscal policy of each country, as well as to learn from the comparative analysis between systems of different countries.

Tax- benefit microsimulation models are useful tools to assess the impact of fiscal policies on distributive justice, poverty and public revenue; Further, harmonized simulations enable a comparative analysis that improves public policies. Microsimulation models were developed only for a few countries in Latin America and used in national studies (López Calva and Urzúa 2011) or to analyse specific components of the fiscal policy. More recently, a group of countries (Ecuador, Colombia, Argentina, Bolivia, Mexico, Uruguay, Paraguay and Venezuela) developed tax benefit models following the EUROMOD modelling conventions (EUROMOD 2017, Sutherland and Figari 2013).

The aim of this work is to analyse the effect of direct taxes and benefits on the income distribution of six Latin American countries: Argentina, Bolivia, Colombia, Ecuador, Paraguay and Venezuela. Our paper represents the first study making use of microsimulation techniques to assess the redistributive role of tax-benefit systems in the region in a comparable manner, and highlights the advantages offered by microsimulation models to evaluate the effect of policy reforms aiming to improve social protection in the region.

Our results present a detailed comparison of tax-benefits systems and their impact on income distribution and poverty across six Latin American countries based on microsimulation data. First, Colombia and Bolivia showed the highest levels of income inequality and Argentina had the lowest inequality. Second, the Foster–Greer–Thorbecke indices show a high disparity in terms of population living below national poverty lines, with lower levels of headcount ratio, poverty gap and severity in Argentina, and higher levels in Colombia. Third, the strongest tax-benefit redistributive impact takes place in Argentina, where inequality decreased by 8.1 percentage points (pp) when measured by the difference between its Gini from market income relative to its disposable income’s Gini

and leads to a remarkable poverty reduction by  $-8.4$  percentage points. In contrast, the poorest redistributive impact takes place in Colombia and Bolivia, where its' tax-benefit system reduces inequality but at a lower 2.4 percentage points, and the impact on poverty reduction goes in a range from a  $-2.1$  pp in Bolivia to a slightly higher  $-4.7$  pp in Venezuela. Finally, in all of our remaining countries, swapping Argentina's personal income tax increases the redistributive effect of their tax-benefit system. This policy swap is particularly important in Venezuela, where Argentina's tax-benefit structure would reduce inequality by an additional 2.13 percentage points. Colombia and Bolivia would improve their inequality reduction too but by a lower 0.8 and 0.7 percentage points respectively. In Ecuador, this swap would not be significant.

This paper is structured as follows. Section 2 presents a literature review of the distributive incidence of tax benefit systems in the Latin American countries considered in this paper. It also summarizes the scarce comparative studies across these countries that use microsimulation models. Section 3 provides information about the data and the newly developed tax benefit microsimulation models in the six Latin American countries included in this study. Section 4 describes the relative size of different tax-benefit components across the income distribution in each fiscal system and their effect on income poverty and inequality. Section 5 present and discusses the results of a swapping exercise, where we selected the most progressive income tax among the countries and applied it to all the other ones, to assess its impact on poverty and inequality.

## **2. Literature review**

In this section we present a literature review of studies on the distributive incidence of fiscal policy in each of the countries included and, additionally, of the comparative studies among LAC countries. Few studies have been found, probably due to the lack of access to household income and expenditure microdata, as well as the recent development of microsimulation models.

In Argentina, several studies have estimated the effect of taxes on income distribution. In late 90s Gómez Sabaini et al. (2002) found a regressive effect due to indirect taxes. Gómez Sabaini and Rossignolo (2009) examined the impact of tax structure in 2006 and Gómez Sabaini et al. (2013) in 2008, and both found a regressive effect, despite of a higher participation of export taxes, income and payroll taxes. With respect to the effect of public expenditures and the impact of specific programs, several studies found a reduction on inequality (Gasparini (1999), Rossignolo (2017), SPE (2002), SPER (1999)) and on poverty (Maurizio (2009), Marchionni et al. (2008)). The net effect of direct and indirect taxes and public expenditures (direct transfers, indirect subsidies and value of expenditure in health and education) on income distribution has been estimated in Gasparini (1999), SPE (2002), Gaggero and Rossignolo (2011), Gómez Sabaini et al. (2013), Rossignolo (2017), Lustig (2017), among others. Although the studies introduced different methodologies, all of them found that the fiscal policy reduces inequality, mainly explained by the effect of direct taxes and direct transfers.

For Colombia, there are few studies on the effect of the fiscal system on income redistribution. However, most of them emphasise the minor role of government reducing

income inequality, the prevalence of narrow tax income bases and revenues, and an increasing importance of conditional cash transfers alleviating poverty. For instance, Goñi et al. (2011) found a negligible effect on inequality with Gini coefficients of market and disposable income in 2003 at 0.54 and 0.53 respectively, on the other hand Gonzalez (1996) and Joumard and Londoño (2013) highlight the weak progressivity of the income tax system and the high share of income paid in taxes by low-income households, especially due to VAT and property taxes.

In the case of Bolivia, Lustig in 2017 with data from 2009 points out that Bolivia's tax system and cash transfers programs do not significantly reduce inequality and poverty; according to the author, this is due to the indirect taxes effect that nullify the positive effect of cash transfers and problems with the programs' target strategy. However, several studies using different methodologies suggest that these programs have, in fact, a positive impact on inequality and poverty reduction (see Ugarte et al. (2016), Arancibia and Macas (2016), Escobar et al (2013), Hernani (2013) and Yañez (2012)). These different arguments between Lustig and the rest of researchers are just a starting point to understand the underlying complexity of Bolivian economy.

For Ecuador, studies by CEPAL-IEF (2014) and Lustig (2017) show that the redistributive role of the tax-benefit system is non-negligible and close to the region average. Cash transfers and in-kind benefits in public health and education play the largest role, whereas the effect of direct taxes is minor. Recent studies using microsimulation techniques show, however, that income tax is more redistributive than previously acknowledged and the overall redistributive role of the tax-benefit system is therefore larger (Jara and Varela, 2017; Bargain et al. 2017).

In Paraguay Molinas and Cabello (2004) find that tax policies that reduce tariffs and subsidies to exports would reduce poverty and inequality. Borda and Caballero (2016) and Itriago (2012) state that the Paraguayan “tax system is weak in efficiency and equity” and with a “regressive fiscal impact”. Garriga et al. (2015) describes recent trends in poverty and inequality, exposing that the fiscal system “remains among the weakest in the region, incorporating a regressive tax system and limited redistribution”.

In the case of Venezuela, there are limited number of studies that evaluate the tax-benefit system due to availability of household data. Seijas et. al (2003) estimate the distribution impact of the tax-transfer system for the late 90s. They found that both taxes and public expenditure were progressive. For the early 2000s Garcia and Salvato (2006) also show that tax system (both VAT and personal income tax) has a relative progressive structure. The transfer system estimation was not as easy as the tax system. For this reason, Garcia and Salvato (2006) only calculate the distributional impact of subsidies for domestic fuel consumption which was shown that was progressive. The most recent contribution was provided in the Commitment to Equity project where Molina (2016) estimate the global impact of taxes and transfers (Lustig, 2017). This research confirms the progressivity of the tax-transfer system in Venezuela as a whole. However, measured with the Gini index shows the impact is relative small.

In Latin America there are few studies of comparative analysis of the distributive incidence of fiscal policy, and the use of tax benefit microsimulation models is scarce. First,

Commitment to Equity (CEQ) Institute estimated the distributive incidence of fiscal policy in sixteen countries in Latin America around 2010, using a common imputation methodology. Lustig (2017) found that tax-benefit systems reduce extreme poverty in twelve out of the sixteen countries and that systems from Argentina, Brazil, Costa Rica and Uruguay are the most redistributive. Redistributive effect is mostly explained by direct taxes and cash transfers. Second, CEPAL IEF (2014) analyse the redistributive effect of fiscal systems of 17 Latin American countries around 2011, including the income tax, social security contributions and cash and in-kind benefits. The effectiveness of fiscal policy in reducing income inequality is higher in Argentina, Brazil, and Uruguay. More recently, Bargain et al (2017) use tax benefit microsimulation models to analyse the impact of tax benefit systems in Ecuador and Colombia income distributions. Their results show that the Ecuadorian system is more redistributive than the Colombian system. Moreover, they estimated that if the Ecuadorian system was applied to the Colombian population, the Gini coefficient would be reduced by 1.7% in Colombia.

The recent development in our regional microsimulation model and expected future improvements through a common harmonized language, will represent an important tool for assessing the redistributive effect of tax-benefit system in LAC countries.

### **3. Data and methodology**

Our analysis makes use newly developed tax-benefit models for Latin American countries based on representative household survey data which are part of LATINMOD and ECUAMOD projects, both developed in EUROMOD framework. In order to ensure comparability, the datasets have been harmonized and the simulations have been implemented in a common tax-benefit modelling language. More precisely, the models follow the EUROMOD modelling conventions (EUROMOD 2017) and have been implemented within the structure of the EUROMOD software (Sutherland and Figari 2013).

#### **3.1. Data**

The analysis makes use of household survey data containing detailed information on household and personal characteristics, employment, earnings, income from capital and property, private transfers, cash transfers, pensions, and expenditures.

The underlying microdata used in ECUAMOD comes from the National Survey of Income and Expenditures of Urban and Rural Households (ENIGHUR) 2011-2012. ENIGHUR contains information for 39,617 households and 153,444 individuals. Adjustments to the data and variables, for the construction of ECUAMOD's input data are described in detail in Jara *et al* (2017).

Data from Colombia is based on the Quality of Life National Survey for 2014 (Encuesta Nacional de Calidad de Vida, ENCV). The data contains information for 20,141 households and 67,332 individuals. Adjustments to the data and variables, for the construction of COLMOD's input data are described in detail in Rodriguez (2017).

LATINMOD-Argentina is based on data from the National Household Survey on Incomes and Expenditures (ENGHo) conducted by the National Bureau of Statistics in Argentina (INDEC) from March 2012 to February 2013. The data contains and is a representative sample of 87% of the population.

LATINMOD-Bolivia is based on the national Household Survey 2015 (Encuesta de Hogares 2015) which contains microdata for 10,171 households and 37,364 individuals.

LATINMOD-Paraguay. is based on the Paraguayan household survey (“Encuesta Permanente de Hogares” EPH), released by the national statistics office. The data used is based in the EPH of the year 2017 which took place from October to December and contained microdata for 9,570 households and 35,215 individuals

LATINMOD-Venezuela simulations are based on the IV National Survey of Households Budgets (*IV Encuesta Nacional de Presupuestos Familiares ENPF*) of the year 2009. The data contains information of 37,142 households and 158,924 individuals. In total, 84 individuals (0.05 per cent of the sample) were dropped from the original sample, leaving us with a sample of 158,840 individuals. Also, no adjustments to the weights were made as a result of dropping individual observations. One important shortcoming is that in de ENPF it was not released information about the household head and the relation of each member with the household head. Therefore, we have no way to know the family kinship.

### 3.2. Tax-benefit simulations

ECUAMOD, the tax-benefit model for Ecuador, has been developed as part of UNU-WIDER’s project on ‘SOUTHMOD-simulating tax and benefit policies for development’ in which tax-benefit microsimulation models have been built for selected developing countries.<sup>9</sup> ECUAMOD simulates direct and indirect taxes, social insurance contributions, as well as the main cash transfers (i.e. Human Development Transfer and Joaquín Gallegos Lara transfer) for the household population of Ecuador.

COLMOD, the tax-benefit microsimulation model for Colombia, has been developed as part of the PhD research undertaken by David Rodriguez at the University of Essex. COLMOD simulated direct taxes, social insurance contributions and the main cash transfers in Colombia (*Familias en acción* and *Colombia Mayor*).

The models for Argentina, Bolivia, Paraguay and Venezuela have been developed as part of the LATINMOD project led by CELAG. LATINMOD is a regional tax-benefit microsimulation model for six Latin American countries that is being developed in the EUROMOD platform and within a harmonized data base which provides cross-country comparability. LATINMOD simulate direct taxes (personal income tax, and social security contributions), indirect taxes (VAT) and the main social cash transfers.<sup>10</sup>

All models are static in the sense that tax-benefit simulations abstract from behavioural reactions of individuals and no adjustments are made for changes in the population composition over time. The remainder of this section describes each model and the datasets used in our project.

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<sup>9</sup> For more information about SOUTHMOD see: <https://www.wider.unu.edu/project/southmod-simulating-tax-and-benefit-policies-development>.

<sup>10</sup> For more information about LATINMOD see the recent book:

This section briefly describes the policy instruments simulated in LATINMOD for the year of the survey for the countries under study, as well as the underlying assumptions and used in the simulations of each policy instrument.

#### *Personal income tax*

In general, the personal income tax policy of the Latin American countries studied here are similar, except for Bolivia, which tax system does not include a personal income tax. To assess this gap Bolivia created the Supplementary Regime for Added Value RC-IVA (Régimen Complementario al Valor Agregado in Spanish) with the purpose of regulating the personal income of employees at the same time it serves to control the payment of VAT. Additionally, self-employed income tax in Bolivia has been assessed through a Corporate Profits Tax and a Transactions Tax, both applied considering that self-employed as a one-person-business.

Table 1 shows that the personal income tax in Latin America is assessed at the individual level. The basis of the personal income tax is constituted mainly by labour income: salaries, income from independent work, pensions (in some countries) and to a lesser extent by income from capital. Exemptions or special treatments include: financial placements, interest on public securities, investment fund benefits, capital gains on real estate and shares. Regarding income tax rates, it can be seen that the income tax rates are applied according to a range of 5% (the minimum in Ecuador) to 35% (the maximum in Argentina), except in Paraguay where the rate is constant (10%) for any level of income.

#### *Social insurance contributions for employee and self-employed*

In order to facilitate the comparison of social insurance contributions for employee and self-employed among the countries, table 2 describes comparative tables of the policies of the countries under study. The following shows that the total contribution rate for employees ranges from 6% in Venezuela to 17% in Argentina, according to the sector of work.

#### *Social Assistance benefits*

Social assistance benefit policies in these 6 countries include unconditional and conditional transfer programs, mainly related to school attendance and medical checks, especially for children and adolescents in the home. However, in each country the programs have been adapted to their own political and institutional contexts (see table 3).

#### **4. Tax-benefit systems and income redistribution in Latin America**

In this section we present a detailed comparison of tax-benefits systems across six Latin American countries based on microsimulation data.<sup>11</sup> First, we provide a comparison of the variation of the size of the tax-benefit components across the income distribution of each country. Then, we present a summary of inequality and poverty indicators calculated from the simulated data. Finally, we provide a detailed picture of the effect of different tax-benefit components on income inequality and poverty.

##### **4.1. Relative size of tax-benefit instruments**

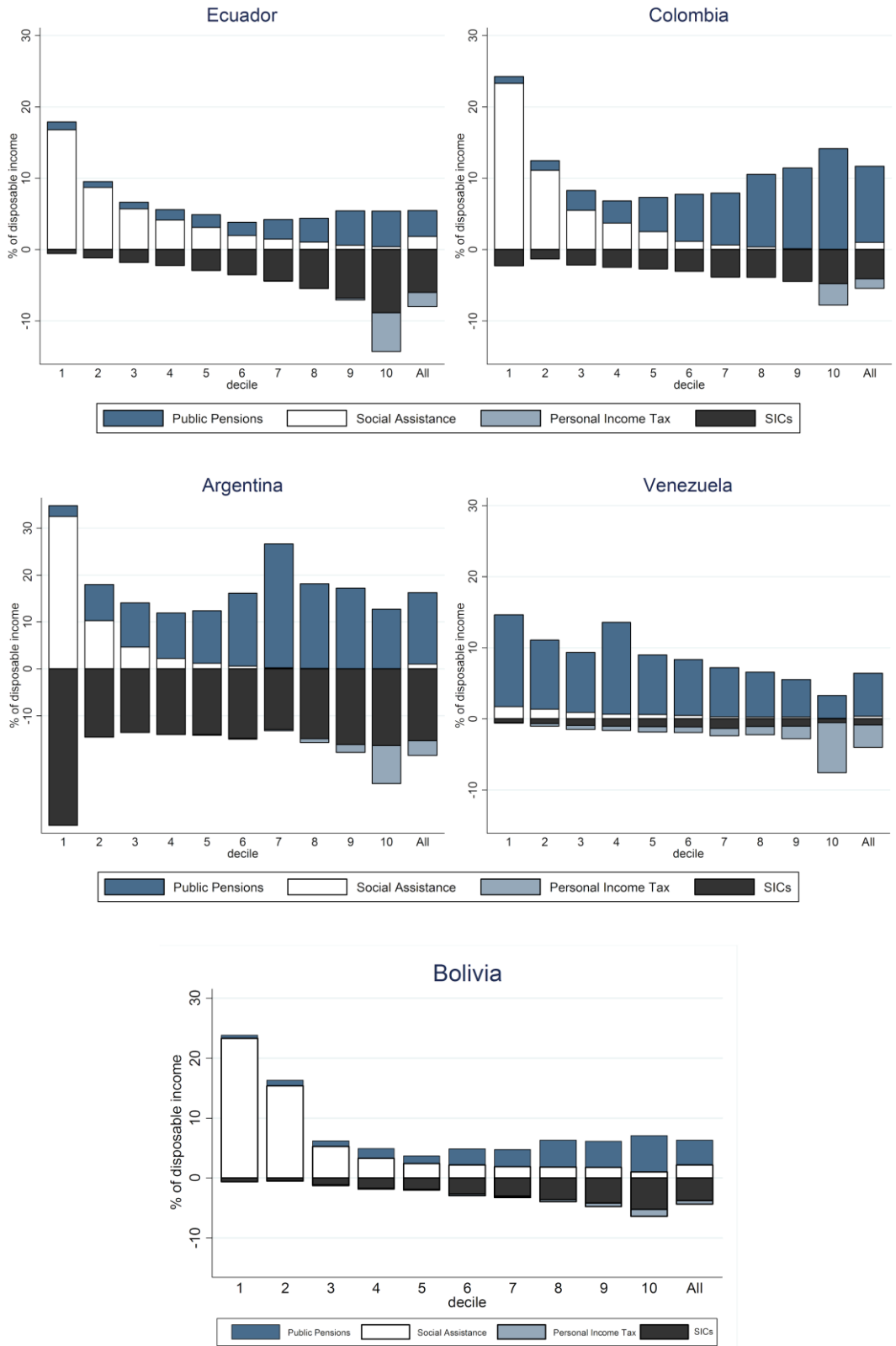
Figure 1 shows the relative size of four tax-benefit components in Ecuador, Colombia, Argentina, Venezuela and Bolivia where the average size of each income component is measured as a percentage of average household disposable income by household disposable income decile, and on average for the whole population. Personal income tax and social insurance contributions are shown as negative values as they represent deductions from disposable income.

**Figure 1: Tax - benefits components as a share of household disposable income**

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<sup>11</sup> Paraguay has no results yet. Validation of simulated outcomes (benefits and taxes) is a crucial part of microsimulation modelling and are show in table 4, 5 and 6 for Bolivia, Argentina and Venezuela. We are still working in the validation stage for all six countries.





**Source:** Authors' calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

Our results show that Venezuela's public pensions succeed in targeting groups with low incomes, representing on average 13% of the household disposable income for individuals at the bottom decile of the income distribution. Venezuela's outcomes are due to the non-

contributory pension system that started to be implemented since 2006. At the other extreme, Colombia and Argentina fail in targeting low income households in which public pensions represent on average 1% and 2% of household disposable income, respectively. In both countries public pensions are targeting individuals in the top decile of the income distribution where they represent on average a 14% of household disposable income.

The figure 1 also shows that, regarding social assistance, Argentina succeeds in allocating benefits to the bottom decile individuals in which these transfers represent on average 33% of the household disposable income at this level. Bolivia and Colombia came second, in both countries, social assistance benefits represent on average 23% of the household disposable income for individuals at the bottom decile. On the other hand, the country that allocate the least amount of benefits across all levels of income is Venezuela, where benefits represent on average 0.6% of the household disposable income. This result is a picture of 2009 transfers when social programs were not fully developed (“*Misiones sociales*”). Also the latter might be related with the way Venezuela assess social assistance not necessarily through monetary transfers.

The countries with the most redistributive income tax policy are Argentina and Venezuela, focusing personal income tax on the top two deciles of income distribution, representing 8% and 7% of the household disposable income respectively; unlike the Bolivian case whose regressive income tax policy represent just 1% of the disposable income of the top decile of income distribution.

In terms of social security, these represent a large percentage of disposable income in Argentinian households, compared against the other countries, for example, in the bottom decile of income in Argentina, 33% of their disposable income goes to SICs, while the top decile in this country allocates 16% of its income to SICs. Ecuador has a more progressive dispersion for the contributions to the SICs, as can be seen in figure 1, individuals at the top decile pays 8% of their disposable income to SICs and individuals at the bottom decile get to pay up to 2% of their disposable income to SICs.

#### 4.2. The effect of tax-benefit systems on poverty and inequality

This section introduces the effect of each tax-benefit instrument on income poverty and inequality. Before continuing, it is worth analysing the broad incidence of each tax-benefit system through the gap between each country’s original income and the disposable income. Table 7 shows income component figures for Ecuador, Colombia, Venezuela, Bolivia and Argentina in national currencies.

**Table 7: Income Components**

	ECUAMOD	COLMOD	LATINMOD		
	Ecuador	Colombia	Venezuela	Bolivia	Argentina
Disposable Income (DPI)	258.41	482,328.93	29,652.26	1,200.14	1,813.21
Labour Income	548.68	1,003,583.14	34,344.25	3,022.34	4,404.19
Market Income	573.04	953,553.52	33,064.82	2,887.47	4,369.85

Note: All values are in national currency: U.S. dollars for Ecuador, Colombian Pesos for Colombia, Bolívares for Venezuela, Bolivianos for Bolivia and Argentinean pesos for Argentina.

**Source:** Author's calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

\*Results are still under validation

Table 8 presents the results of our comparison of inequality and poverty indicators across our five countries. In terms of income distribution, Table 8 shows that the highest levels of inequality are given in Colombia and Bolivia with a Gini coefficient of 56.8 and 48.3 respectively. On the other hand, Argentina seemed to have the lowest level of inequality, with a Gini of 45.6. When focusing in the upper and lower percentiles of income distributions (P90/P10), the table shows that in Venezuela, incomes higher than 90% of the population are 6.8 times greater than incomes higher than only 10% of the population. Ecuador has the second lowest ratio (7.5) while the most unequal or higher ratio is reached in Bolivia, where richest incomes are 16.2 times the poorest ones.

**Table 8: Absolute poverty rates and income inequality in 2015**

	ECUAMOD	COLMOD	LATINMOD		
	Ecuador	Colombia	Venezuela	Bolivia	Argentina
<i>Inequality</i>					
Gini Index	46.2	56.8	46.1	48.6	45.6
Atkinson index (0.5)	17.9	27.1	19.0	19.6	16.6
Atkinson index (1)	30.9	45.4	31.3	37.9	32.4
Atkinson index (2)	51.0	75.8	57.0	75.9	99.3
p90/p10	7.5	14.2	6.8	16.2	10.8
p90/p50	3.0	3.5	2.7	2.9	2.8
p50/p10	2.5	4.0	2.5	5.6	3.9
<i>Poverty</i>					
Headcount index (FGT0)	18.1	36.5	25.3	29.2	6.6
Poverty Gap index (FGT1)	5.6	16.7	8.3	15.2	3.6
Poverty Severity index (FGT2)	2.6	10.9	3.9	11.0	2.8

**Source:** Author's calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

\*Results are still under validation

From a 'normative' perspective, table 8 also provides the Atkinson index, a welfare-based measure of inequality representing the percentage of total income that a society should forego in order to have a more equal income distribution among its citizens. We show results for three weighting parameters that measure the 'inequality aversion' ( $\epsilon = 0.5, 1, \text{ and } 2$ ). Calculating the Atkinson index for different values of " $\epsilon$ " allows us to change the importance attached to variations at different points in the income distribution, larger values of " $\epsilon$ " being more sensitive to variations at the lower end of the distribution. Hence, if we consider a high aversion to inequality ( $\epsilon = 2$ ), we are focusing our attention towards what is happening to lower incomes of our distributions. Accordingly, Table 8 shows that using  $\epsilon = 2$ , the highest Atkinson index is reached in Argentina, where the loss of welfare because of inequality is 99.3 percent of what the welfare level would be if the overall

income had been equally distributed. Welfare losses in Colombia and Bolivia are around 76 percent while Ecuador has the lowest percentage of welfare loss because of inequality in its income distribution (51 percent of what the welfare level would be if the overall income had been equally distributed).

The second section of Table 8 compares statistics on poverty across countries according to national poverty lines. The Foster–Greer–Thorbecke indices point out a high disparity in terms of population living below poverty lines. While in Argentina 6.6 percent of individuals are poor, this percentage rises up to 36.5 percent in Colombia and almost 30 percent in Bolivia. Ecuador has the second lower percentage of poor individuals (18.1 percent of its population). These disparities are also present in terms of the depth of poverty. The poverty gap shows that poverty is more severe in Colombia and Bolivia (16.7 and 15.2 percent respectively) relative to Argentina for instance, where poverty is less severe given a poverty gap far below those levels: 3.6 percent. Inequality among the poor is also much higher in Colombia and Bolivia relative to Ecuador, Venezuela and Argentina. While the poverty severity indexes in the formers are around 11 percent, inequality among the poor in these last three countries are around 3 percent and 4 percent in the case of Venezuela.

Having analysed inequality and poverty indicators across countries, we focus our interest towards the effects each tax-benefit system has directly on poverty and inequality. This is the key to understanding the role of taxes and benefits in reducing poverty and inequality as well as improving the design of new policy instruments. Tables 9 and 10 compare the effects of different tax-benefit components on income inequality and poverty. We focus on income inequality as measured by the Gini coefficient and calculate poverty rates based on the national poverty lines. In order to assess the effect of social benefits, we deduce them from disposable income and recalculate income inequality and poverty. In the same way, we assess the effect of taxes and SICs by adding back each component separately to disposable income and recalculate poverty and inequality. Finally, we also show poverty and inequality estimates for market incomes.

**Table 9: GINI Index**

	ECUAMO				
	D	COLMOD	LATINMOD		
	Ecuador	Colombia	Venezuela	Bolivia	Argentina
<i>Disposable Income (DPI)</i>	46.2	56.8	46.1	48.6	45.6
DPI minus Social Assistance Benefits	47.6	57.8	46.2	49.5	46.7
DPI plus Taxes	47.3	57.4	47.7	48.8	46.9
DPI plus Social Insurance Contributions	47.5	57.2	46.0	49.3	46.1
<i>Market income</i>	50.1	59.2	50.5	51.0	53.7
Market income minus Benefits	48.8	58.2	50.3	49.9	52.6
Market income plus Taxes	49.1	58.7	48.9	50.9	52.7
Market income plus Social Insurance Contributions	48.9	58.7	50.6	50.4	54.3

**Source:** Author's calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

The redistributive effect of social assistance benefits, taxes, SICs, is defined as the difference between the Gini coefficient for disposable income and the Gini for market income. Table 9 shows that the tax-benefit system that achieves the highest income inequality reduction is that of Argentina. Indeed, Argentina's system leads inequality reduction by more than 8 percentage points (pp), followed by Venezuela and Ecuador (–4.4 and –3.9 percentage points respectively). Tax-benefit systems in Colombia and Bolivia allows decreasing inequality by 2.4 pp in both cases.

A detailed analysis of table 9 points out that in Ecuador, Colombia and Bolivia, the income component that reduces inequality the most is social benefits, accounting for a reduction of around 1.4, 1 and 0.9 percentage points respectively. In this case, we subtract from the disposable income's Gini coefficient the calculated Gini coefficient of a disposable income minus social benefits. In the case of Venezuela and Argentina, the income component that reduces inequality the most is taxes, accounting for a reduction of 1.6 points in Venezuela and 1.3 points in Argentina. Here we calculate the difference between the Gini coefficient for disposable income and the Gini coefficient for disposable income plus taxes. Finally, a cross-country analysis of the effect of SICs in inequality reduction shows that it is in Ecuador where this effect is higher relative to the other countries. While SICs reduce income inequality by around 0.5 percentage points in Colombia, Venezuela, Bolivia, and Argentina, their incidence in Ecuador is far higher, accounting for an inequality reduction of 1.3 percentage points. In this case, the Gini for disposable income is compared with the Gini for disposable income plus SICs.

Table 10 presents the effect of tax-benefit systems on poverty measured by the headcount ratio. As before, when we compare absolute poverty for disposable income and absolute poverty for market income, it is the Argentinian tax-benefit system the one that achieves the best outcomes allowing for a poverty reduction of 8.4 percentage points. Venezuela too have an important poverty reduction of 4.7 pp, followed by Ecuador (–3.5 pp), Colombia (–3.3 pp) and Bolivia (–2.1 pp). The income component analysis shows that for all cases, the income component that reduces poverty the most is social benefits. Social benefits reduce poverty by 2.7 percentage points in Ecuador followed by Argentina (–1.7 pp). In Colombia and Bolivia social benefits account for a one-percentage point poverty reduction while this effect in Venezuela poverty decrease is marginal. The effects of taxes and SICs are, on the other hand, very modest as in most of the countries, they are lower than 0.5 percentage point.

**Table 10: Poverty Head Count**

	COLMO				
	ECUAMOD	D		LATINMOD	
	Ecuador	Colombia	Venezuela	Bolivia	Argentina
<i>Absolute poverty headcount</i>					
<i>Disposable Income (DPI)</i>	18.1	36.5	25.3	29.2	6.6
DPI minus Social Assistance Benefits	20.8	37.5	25.7	30.2	8.3
DPI plus Taxes	18.1	36.2	25.1	29.2	6.6
DPI plus Social Insurance Contributions	17.8	35.7	24.9	28.8	5.8
<i>Market income</i>	21.6	39.8	30.0	31.3	15.0

Market income minus Benefits	18.9	38.8	29.6	30.3	13.1
Market income plus Taxes	21.6	40.1	30.2	31.3	15.0
Market income plus Social Insurance Contributions	22.0	40.5	30.4	31.8	16.4

**Source:** Author's calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

## 5. Reforming tax-benefit systems in Latin America: a policy swap exercise

The previous section highlighted the extent to which the redistributive effect of tax-benefit systems differs across Latin American countries. Consistently with the literature, Argentina comes on top as having the most redistributive tax-benefit system with inequality decreasing by 8 percentage points when Gini from market income is compared to Gini of disposable income. In this section, we exploit the advantages offered by tax-benefit microsimulation to assess the effect of swapping some policy instrument from Argentina to the other countries in our sample. In particular, we perform counterfactual scenarios in which the Argentinian personal income tax replaces the national personal income tax policies of other countries. All monetary parameters of the Argentinian personal income tax, e.g. the level of tax bands, are expressed in proportion of minimum wages in each country. The results presented below focus on the effect of the policy swap exercise on income inequality as measured by the Gini coefficient.

Our focus on personal income tax is motivated by two main reasons. First, although taxes on goods and services represent the largest share of tax revenue, the importance of taxes from incomes and profits has grown over time. On average, in the LAC region the share of revenues from taxes from incomes and profits has grown from 22.3% to 27.2% of total tax revenues between 1990 and 2015 (OECD/ECLAC/CIAT/IDB 2017). Out of our selected countries, Venezuela is the only one that has experienced a decline in the share of revenue from taxes from incomes and profits. Second, reforms to personal income tax are potentially interesting for countries in the region because they could allow to achieve a reduction in income inequality and at the same time increase government revenues during a period where oil prices are low.

Table 11 below shows the effect of our policy swap in terms of the redistributive effect of tax-benefit systems. In all countries, replacing the national income tax by the Argentinian personal income tax would increase the redistributive effect of the tax-benefit system, when Gini from market income is compared to Gini of disposable income. The largest increase is observed in Venezuela, where the Gini coefficient would decrease by 1.57 additional percentage points (from 4.93 pp to 6.5 pp) if the Argentinian personal income tax was implemented in this country. The smallest increase is observed in Ecuador, where the Gini coefficient from disposable income falls only from 46.21 in the baseline to 46.16 in the counterfactual scenario.

**Table 11: Effect of the tax-benefit system on the Gini coefficient: baseline and reform**

	Baseline	Policy swap (Argentinian income tax)
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	Disposable income	Market income	Difference	Disposable income	Market income	Difference
Bolivia	48.58	51.04	-2.46	47.92	51.04	-3.12
Colombia	56.82	59.15	-2.33	56.03	59.15	-3.13
Ecuador	46.21	50.09	-3.88	46.16	50.09	-3.93
Venezuela	46.11	50.48	-4.37	44.77	50.48	-6.50

**Source:** Author's calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

The marginal contribution of the Argentinian personal income tax on income inequality is presented in table 12. The largest effect of the policy swap is observed in Venezuela, where the Argentinian personal income tax would have an additional contribution to inequality reduction of 1.6 percentage points.

Several factors explain these results. First, the level of the non-taxable income threshold varies across countries. In Argentina, personal income tax applies to incomes above the non-taxable income threshold, which in 2009 was equivalent to 2.34 times the annualised minimum wage for employees, and 0.81 times the annualised minimum wage for self-employed. These thresholds are lower than in the other Latin American countries analysed. In Ecuador, a common non-taxable income threshold applies to employees and the self-employed, which was equivalent to 2.54 times the annualised minimum wage in Ecuador in 2015. In Bolivia, employees are subject to income tax on incomes above a non-taxable income threshold equivalent to 4.58 times the annualised minimum wage. For the self-employed, there is no threshold in Bolivia. Venezuela is the only country where the minimum exempted income threshold is lower than in Argentina and is equivalent to 1.78 times the annualised minimum wage.

Second, in all countries different deductions can be made from taxable income. In Argentina, only deductions from dependants (e.g. spouse, children or parents) apply. In Ecuador, Colombia and Venezuela, deductions from personal expenditures such as education, health and housing expenditures apply, and in the case of Ecuador also deductions from personal expenditures in food and clothing.

Third, the progressivity of the income tax schedule differs across countries. The tax schedule is relatively similar in Argentina, Colombia Ecuador and Venezuela, with different tax bands and a highest tax rate between 33%- 35%. Bolivia, on the other hand has a proportional income tax with a rate of 13% for employees and 3% for the self-employed.

**Table 12: Marginal contribution of personal income tax: baseline and reform**

	Baseline			Policy swap (Argentinian income tax)		
	Disposable income (DPI)	DPI plus Direct taxes	Difference	Disposable income (DPI)	DPI plus Direct taxes	Difference
Bolivia	48.58	48.75	-0.17	47.92	48.75	-0.83

Colombia	56.82	57.35	-0.53	56.03	57.35	-1.33
Ecuador	46.21	47.29	-1.08	46.16	47.29	-1.13
Venezuela	46.11	47.71	-1.59	44.77	47.61	-2.83

**Source:** Author's calculations based on LATINMOD version beta, ECUAMOD version 1.4 and COLMOD version 1.1.

## 6. Conclusions

We used microsimulation models to analyse the effect of tax-benefit systems on poverty and inequality for five Latin American countries: Argentina, Bolivia, Colombia, Ecuador, and Venezuela. We also developed a swap exercise to analyse the effects on poverty and inequality when applying to the rest of our countries the most progressive tax-benefit system, which turned to be that of Argentina.

The challenge of simulating and comparing policies between five LAC countries at the same time allowed us to include a number of interesting findings. First, and in terms of distribution, our model showed the highest levels of income inequality in Colombia and Bolivia with a Gini coefficient of 56.8 and 48.6 respectively. On the other hand, Argentina had the lowest inequality (45.6). This scenario was consistent with a p90/p10 ratio of 14.2 and 16.2 in Colombia and Bolivia and a lower 6.8 in the case of Venezuela. From a 'normative' perspective and focusing in the lower end of each country's income distribution, the Atkinson index showed higher indices for Argentina and Bolivia (99.3 and 75.9 respectively) and lower figures for Ecuador (51) and Venezuela (57).

Second, differences across countries are more evident when analysing poverty. The Foster–Greer–Thorbecke indices show a high disparity in terms of population living below national poverty lines. While in Argentina the headcount ratio reaches 6.6 percent, in Colombia this percentages rises up to 36.5 percent. Again, these figures are consistent with similar disparities in terms of poverty gap and severity indexes: lower levels in Argentina (3.6 and 2.8 respectively) and higher levels in Colombia (16.7 and 10.9).

Third, the strongest tax-benefit redistributive impact takes place in Argentina, where inequality decreased by 8.1 percentage points (pp) when measured by the difference between its Gini from market income relative to its disposable income's Gini. The second best redistributive performance was that of Venezuela with an inequality reduction of 4.4 pp, followed by Ecuador (−3.9 pp). Finally, the poorest redistributive impact takes place in Colombia and Bolivia, where its' tax-benefit system reduces inequality but at a lower 2.4 percentage points. In the same sense, Argentina's tax-benefit system also leads to a remarkable poverty reduction by −8.4 percentage points. The remaining tax-benefit systems also reduce poverty in a range that goes from a −2.1 pp in Bolivia to a slightly higher −4.7 pp in Venezuela.

Finally, swapping Argentina's tax-benefit system to the other countries allow us to come across an interesting result. In all of our remaining countries, swapping Argentina's



personal income tax increases the redistributive effect of their tax-benefit system. This policy swap is particularly important in Venezuela, where Argentina's tax-benefit structure would reduce inequality by an additional 2.13 percentage points. Colombia and Bolivia would improve their inequality reduction too but by a lower 0.8 and 0.7 percentage points respectively. In Ecuador, this swap would not be significant.

As observed all over our analysis, tax-benefit microsimulation models represent an outstanding tool for assessing the redistributive effect of tax-benefit systems. In this sense, modelling the tax-benefit system and understanding its potentiality in reducing income inequality and poverty is a first step to be considered when implementing public policies in developing countries. We expect that future improvements in our regional microsimulation model, through a common harmonized language, will represent an important opportunity for policy developments and collaborations within the region as well as a huge challenge aiming to strengthening Latin America's so needed social protection.

**Table 1: Main characteristics of the personal income tax in Latin America**

	Ecuador	Colombia	Argentina	Bolivia	Paraguay	Venezuela
<b>P e r s o n a l  I n c o m e  T a x</b>	· Tax unit is the individual	· Tax unit is the individual	Tax unit is the individual	<i>Bolivia does not have a PERSONAL INCOME TAX policy, but it has approached this issue by establishing differentiated taxes based on income for employees (RC-IVA) and self-employees (IUE and IT)</i>	· Tax unit is the individual	· Tax unit is the couple or individual.
	· Taxable income is gross labour income plus extra pay plus utilities participation plus SICs	· Taxable income is labour income, extra pay, pension income and income from assets	The taxable income includes land rent, capital gains and labour income	<b>For employees:</b> · Tax unit is the individual · Taxable income is gross labour income plus extra pay minus SICs · Exemptions include holiday bonuses and maternity bonuses. · Deductions include all billed expenditures. · Tax base is taxable income minus exemptions, minus deductions · Tax schedule is calculated as it follows: (Tax base - 2 national minimum wage) * 13% - (2 national minimum wage * 13%) <b>For self-employees:</b> Utilities tax · Tax unit is the individual (considered as an one-person-business)	· Taxable income is labour income, capital gains from sale of real estate, securities, interest, commissions or capital returns, and other incomes such that they overcome 30 monthly minimum wages per year.	· Taxable income is labor income and capital income.
	· Exemptions include income from pensions, 13th and 14th months, reserve funds, and deductions for old age and disability	· Exemptions include income from company ownership, taxed as business tax; depending on the system up to 25% of labour income	Exemptions include interest from fixed term deposits and savings accounts; national bonus; dismissal compensations; royalties; donations; inheritances and legacies; awards of games of luck; benefits based on activities related to preservation of the environment.	· Deductions include all billed expenditures. · Tax base is taxable income minus exemptions, minus deductions · Tax schedule is calculated as it follows: (Tax base - 2 national minimum wage) * 13% - (2 national minimum wage * 13%) <b>For self-employees:</b> Utilities tax · Tax unit is the individual (considered as an one-person-business)	· Exemptions include dividends and profits received by the shareholders, capital gains from assets of a sole proprietorship, incomes from regulated gambling, inheritances and the adjudication of assets as a result of a marital dissolution.	· Main exemptions:(i) those taxpayers with a tax base less than 1.000 tax units or a gross income less than 1500 tax units. (ii) Income from interest received from bank account savings. (iii) Pensions.
	· Deductions include SICs and deductions from personal expenditures in food, clothing, education, health, and housing	· Deductions include expenditure in education, health and mortgage payments	Deductions include familie charges (children, partner and parents not earning incomes); general deductions (expenditures in health, housing rental, among others); special deductions for labour income.	· Taxable income is gross labour income minus estimated business-related expenditures and SICs. · It is considered that self employees expenditures are 50% of their gross labour income. · Tax base is taxable income · Tax schedule is calculated as it follows: (Tax base - 50% of gross labour income) * 25%	· Deductions include contributions to social security entities, donations (up to an amount that does not exceed 20% of taxed net income), personal and family expenses (for maintenance, education, health, clothing, recreation, housing, and leisure), bank deposits in local institutions, private pension funds, capitalization in the cooperative societies.	· Deductions include expenditure in education, health and mortgage payments. Residents may opt for a unique deduction of 774 tax units instead of the above deductions.  · Tax base is taxable income minus exemptions, minus deductions
	· Tax base is taxable income minus exemptions, minus deductions	· Tax base is taxable income minus exemptions, minus deductions	Tax base is taxable income minus social insurance contributions, non taxable minimum, exemptions and deductions.	Transactions tax · Tax unit is the individual (considered as an one-person-business) · Taxable income is Income from property rental · Tax base is taxable income · Tax schedule is calculated as it follows: 3% of Tax base	· Tax base is taxable income minus exemptions, minus deductions- Individuals must pay this tax if and only if their annual income exceeds an annual amount of equal to 60 monthly minimum wages (Gs 117,870,420).	· Tax schedule is formed of different bands rates between 6% and 34%. Resident individual receives an additional annual personal rebate of 10 tax units and a family rebate of 10 tax units for each member that fulfill the legal age.
	· Tax schedule is formed of eight tax bands and rates between 5% and 35%	· Tax schedule is formed of different bands contingent on the system applied, rates are between 0% and 33%	Tax schedule is formed of seven tax bands between 9% and 35%		· Two rates: 10% when annual income is equal to or greater than 120 minimum annual wages (Gs 235,740,840) and 8% when income is lower than this value.	

**Source:** LATINMOD: Regional Microsimulator of Fiscal Policy in Latin America, 2018.

**Table 2: Main characteristics of social insurance contributions for employee and self-employed in Latin America**

<b>Countries</b>	<b>Employee Social Insurance Contributions</b>	<b>Self-employed Social Insurance Contributions</b>
<b>Ecuador</b>	<ul style="list-style-type: none"> <li>· All employees are liable to pay SICs</li> <li>· Contribution base is gross employment income</li> <li>· Total contribution rate is either 9.45% or 11.45% depending on the category of the worker</li> <li>· No SICs are paid if income below 340 USD</li> </ul>	<ul style="list-style-type: none"> <li>· Self-employed workers can contribute to SICs on a voluntary basis</li> <li>· Contribution base is declared gross self-employment income</li> <li>· Total contribution rate is 20.50%</li> <li>· No SICs are paid if income below 340 USD</li> </ul>
<b>Colombia</b>	<ul style="list-style-type: none"> <li>· All employees are liable to pay SICs</li> <li>· Contribution base is gross employment income</li> <li>· Total contribution rate is between 8% and 10% depending on employment income</li> <li>· Min. contribution: 8% of a minimum wage. Max. contribution: 12% of 25 minimum wages</li> </ul>	<ul style="list-style-type: none"> <li>· All self-employed are liable to pay SICs</li> <li>· Contribution base is 40% of gross self-employment income</li> <li>· Total contribution rate is between 8% and 10% depending on income</li> <li>· Min. contribution: 8% of a minimum wage. Max. contribution: 12% of 25 minimum wages</li> </ul>
<b>Argentina</b>	<ul style="list-style-type: none"> <li>· All employees are liable to pay SICs</li> <li>· Contribution base is gross employment income</li> <li>· Total contribution rate is 17%, with minimum and maximum retribution limits</li> </ul>	<ul style="list-style-type: none"> <li>· All self-employed are liable to pay SICs</li> <li>· Two systems: "autónomos" (5 categories depending on the activity and the gross income) and "monotributistas" for small taxpayers.</li> <li>Both systems: total contribution is a fixed amount depending on the category of the worker</li> </ul>
<b>Bolivia</b>	<ul style="list-style-type: none"> <li>· All employees are liable to pay SICs</li> <li>· Contribution base is gross employment income</li> <li>· Total contribution rate is between 12,71% and up (depending on employment income).</li> <li>· Min. Contribution: 12,71% when gross employment income is below 13.000 Bs.</li> <li>· Max. Contribution: <b>1%</b> of National Solidarity Contribution when employment income is above 13.000 Bs; <b>5%</b> of National Solidarity Contribution when employment income is above 25.000 Bs; <b>10%</b> of National Solidarity Contribution when employment income is above 35.000 Bs.</li> </ul>	<ul style="list-style-type: none"> <li>· Self-employed workers can contribute to SICs on a voluntary basis</li> <li>· Contribution base is declared gross self-employment income</li> <li>· Total contribution rate is between 14, 42% and up (depending on employment income).</li> <li>· Min. Contribution: 14,42% when gross employment income is below 13.000 Bs.</li> <li>· Max. Contribution: <b>1%</b> of National Solidarity Contribution when self-employment income is above 13.000 Bs; <b>5%</b> of National Solidarity Contribution when self-employment income is above 25.000 Bs; <b>10%</b> of National Solidarity Contribution when self-employment income is above 35.000 Bs.</li> </ul>
<b>Paraguay</b>	<ul style="list-style-type: none"> <li>· All employees are liable to pay SICs</li> <li>· Contribution base is gross employment income</li> <li>· Contribution rate depends on the system the employee contributes: IPS (general 9%), Caja Fiscal (16%), Caja Bancaria (13%), Caja Municipal (10%).</li> </ul>	
<b>Venezuela</b>	<ul style="list-style-type: none"> <li>· All employees are liable to pay SICs</li> <li>· Contribution base is gross employment income</li> </ul>	Is not compulsory for self employed workers

· Total contribution rate is 6% for general workers.  
Armed Force rate is 13.5%

Max. contribution: the contribution base is up to a ceiling of five minimum wages

Source: LATINMOD: Regional Microsimulator of Fiscal Policy in Latin America, 2018.

Table 3.a: Main characteristics of the Social Assistance benefits in Latin America

	Ecuador	Colombia	Argentina	Bolivia	Venezuela	Paraguay
<b>S</b>	<i>Bono de Desarrollo Humano</i>	<i>Familias en acción</i>	<i>Asignación Universal por Hijo</i>	<i>Bono Juancito Pinto</i>	<i>Misión Madres del Barrio, Misión Niño Jesús, Misión Hijos de Venezuela y la Fundación Nacional El Niño Simón. All has been integrated in 2014 in the "Gran Misión Hogares de la Patria".</i>	<i>Programa Tekoporá</i>
<b>A</b>	Proxy means-tested benefit based on the composite index of the Social Registry	Proxy means-tested benefit based on a composite welfare index (SISBEN)	Cash transfer for poor families	Non means-tested benefit for children from 1st to 12th grade that record an 80% of scholar attendance in public schools.	Non-means tested benefit	Based on households characteristics and selection instruments (Life Quality Index).
<b>S</b>	· Eligible are: (i) poor families with children below 18 years; (ii) vulnerable elderly not affiliated with social security, not receiving pensions; and (iii) vulnerable persons with 40% or higher degree of disability, not affiliated with social security.	· Eligible are: families with children below 18	Eligible are: parents with dependent children under the age of 18 who are informal workers with an income lower than the minimum salary of the formal sector, unemployed people without unemployment benefits, or domestic service workers.	· Eligible are: children and teenagers from 1st to 12th grade below 21 years old who enrolled in public schools.	Women that does not have paid work and that live in a family with an income less than the minimum basket /minimum wage	· Eligible are: households in a situation of poverty and vulnerability.
<b>S</b>	Amount: 50 USD per month	Amount: (i) health component: 33-38 USD per month per family; (ii) education component: 11-24 USD per month per child for up to 3 children	Amount: 17 Usd per child (up to 5 childs)	Amount: 200 Bs. per year	Amount "Mision Madres del Barrio": 60-80% of minimum wage. Amount "Misión Hijos de Venezuela": 430 Bs. of each son and 600 Bs. for each son with disability. Up to 3 amounts.	Amount: (i) Fixed amount per household: 15,6 USD per month; (ii) pregnant woman: 6,9 USD per month; (iii) disability (up to 2 individuals): 26 USD per month; (iv) Indigenous family: 39 USD per month ; (v) 1 child 0 to 18 years old: 22,5 USD per month, 2 childs: 29,5 USD per month, 3 childs, 36,4 USD per month, 4 childs: 43,3 USD per month
<b>t</b>						
<b>a</b>						
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Conditionality for children: school enrolment and attendance, and medical check-ups	· Conditionality for children: school enrolment and attendance, and medical check-ups	Conditionality for children: school enrolment and attendance, and medical check-ups	Conditionality: 80% of school attendance in public, alternative or special schools.		Conditionality for children: school enrolment and attendance, and medical check-ups.
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Source: LATINMOD: Regional Microsimulator of Fiscal Policy in Latin America, 2018.

Table 3.b: Main characteristics of the Social Assistance benefits in Latin America

	Ecuador	Colombia	Bolivia	Venezuela	Paraguay
<b>S</b> <b>O</b> <b>C</b> <b>I</b> <b>A</b> <b>S</b> <b>S</b> <b>I</b> <b>S</b> <b>T</b> <b>A</b> <b>N</b> <b>C</b> <b>E</b> <b>B</b> <b>E</b> <b>N</b> <b>E</b> <b>F</b> <b>I</b> <b>T</b> <b>S</b>	<i>Bono Joaquín Gallegos Lara</i>	<i>Colombia mayor</i>	<i>Bono Juana Azurduy</i>	<i>Misiones educativas: Robinson (I y II), Ribas y Sucre</i>	<i>Adulto Mayor</i>
	· Benefit for persons caring for individuals with severe disability and/or illness	Proxy means-tested benefit based on a composite welfare index (SISBEN)	Non means-tested benefit for women between 13 and 50 years that are pregnant and children below 2 years old.	Scholarship for primary, secondary —high school— and undergraduate education.	Based on poverty condition of elderly persons.
	· Amount 240 USD per month	· Eligible are: elderly older aged 54 years (female) and 58 years (male) or more; no pension income	Eligible are: pregnant women between 13 and 50 years. Children below 2 years.	Eligible are: (i) poor families; (ii) The individual must be enrolled in one of the education institutions of the government	Eligible are: elderly older aged 65 years or more
		· Amount: Between USD 21 and USD 59 per month depending on city/town	Amount: For pregnant women: 320 Bs For each pregnancy period. For children below 2 years: 1.500 Bs	Amount: 100 USD per month	Amount: 25% of the current minimum wage.
			Conditionality: For pregnant women: 4 pre natal controls (50 Bs each) Birth at public health institutions. For children below 2 years: Bi-monthly postnatal health checks (125 Bs each)	Conditionality: school enrollment and attendance	
		<i>Renta Dignidad</i>	<i>Gran Misión En Amor Mayor Venezuela</i>		
		Non means-tested benefit for elderly people above 60 years.	Noncontributory pension		
		Eligible are: elderly people above 60 years old.	Eligible are: (i) old age persons that did not contribute to the social insurance during their Laboral life (ii) Income less than minimum wage		
		Amount: For elderly people who did not contribute to social security: 2.400 Bs For elderly people who contribute to social security: 1.800 Bs	Amount: Minimum wage		

Source: LATINMOD: Regional Microsimulator of Fiscal Policy in Latin America, 2018.

Table 4: Bolivian tax-benefits instruments for 2015.

Policy	Tax Revenue / Transfers Expenditure				Number of taxpayers/beneficiaries	
	Microsimulation		External data		Microsimulation	External data
	Millions Bs	% GDP	Millions Bs	% GDP		
<b>Personal Income Tax</b>	<b>899.25</b>	<b>0.394%</b>	<b>914.59</b>	<b>0.401%</b>	<b>172,781</b>	<b>184,260</b>
Personal Income Tax for EMPLOYEES	475.89	0.209%	491.22	0.215%	96,989	108,468
Personal Income Tax for SELF-EMPLOYED	423.37	0.186%	423.37	0.186%	75,792	75,792*
<b>Social Insurance Contributions</b>	<b>5,986.49</b>	<b>2.625%</b>	<b>5,519.97</b>	<b>2.421%</b>	<b>881,378</b>	<b>831,555</b>
Employees SICs	4,810.86	2.110%	4,794.35	2.102%	760,870	755,874*
Self-Employed SICs	1,175.64	0.516%	725.62	0.318%	120,508	75,681*
<b>Pensions (Old Age)</b>	<b>5,568.52</b>	<b>2.442%</b>	<b>5,133.90</b>	<b>2.251%</b>	<b>178,939</b>	<b>158,618</b>
<b>Social Benefits</b>	<b>3,205.57</b>	<b>1.406%</b>	<b>3,434.61</b>	<b>1.506%</b>	<b>3,995,406</b>	<b>3,369,875</b>
Juancito Pinto Bonus	466.22	0.204%	446.00	0.196%	2,330,618	2,228,900
Juana Azurduy Bonus (MOTHER)	25.29	0.011%	39.23	0.017%	164,137	90,435
Juana Azurduy Bonus (CHILD)	359.72	0.158%	111.38	0.049%	479,630	95,599
Social Benefit for the Elderly (Renta Dignidad)	2,354.34	1.032%	2,838.00	1.245%	1,021,021	954,941

Note: \*Self-employed income tax and SICs information is not available, the number reported comes from 2015 Household Survey.

Source: LATINMOD version beta. Unidad de Análisis de Políticas Sociales y Económicas (UDAPE).

Table 5: Argentinian tax-benefits instruments for 2012

Policy	Tax Revenue / Transfers Expenditure				Number of taxpayers/beneficiaries	
	Microsimulation		External data		Microsimulation	External data
	Millions \$	% GDP	Millions \$	% GDP		
Personal Income Tax	2 4.348	0.92%	35.301	1.34%	1.974.245	859.858
Social Insurance Contributions SIC	n/a	n/a	n/a	n/a	10.628.168	8.212.664
Employee	n/a	n/a	n/a	n/a	7.246.681	6.309.135
Self-Employed	n/a	n/a	n/a	n/a	3.381.487	1.903.529

Cash transfer in social assistance programs (Asignación Universal por hijo) (1)	689	0.03%	n/a	n/a	1.520.112	1.854.993
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(1) The statistic corresponds to the number of owners, not to beneficiaries.

Table 6: *Venezuelan tax-benefits instruments for 2009.*

Policy	Tax Revenue / Transfers Expenditure				Number of taxpayers/beneficiaries	
	Microsimulation		External data		Microsimulation	External data
	Millions Bs	% GDP	Millions Bs	% GDP		
Personal Income Tax (1)	5,042.6	0.71%	4,688	0.7%	33,866	n/a
Social Insurance Contributions SIC (2)	7,980.9	1.13%	6,740	0.95/1.3%	2,259,325	n/a
Pensions (3)	21,189.6	3.00%	22,280	3.2%	1,610,279	1,618,881
Cash transfer in social assistance programs (Misión Madres del Barrio and others) (4)	1,216.5	0.17%	n/a	n/a	150,943	n/a
Scholarship for primary, secondary — high school— and undergraduate education (Mision Ribas, Robinson y Sucre) (5)	784.7	0.11%	n/a	n/a	189,101	175,246
Non-contributory pension: "Gran Misión en Amor Mayor Venezuela " (since 2012) (6)	n/a	n/a	n/a	n/a	n/a	n/a

(1) The official tax collection is an estimation of the authors based on the tax record of personal income tax from the Tax Office of Venezuela—SENIAT—.

(2) The first official estimation comes from OECD statistics and the second one from Community to Equity CEQ Standard Indicators Web version 2.0

(3) The amount of tax collection comes from CEQ Standard Indicators Web version 2.0 and the beneficiary are form Venezuela's Government

(4) The main programs that give cash transfer are: "Madres del Barrio" (2006) and "Hijos e Hijas de Venezuela" (2011). Now they are part of the integrated Mission "Gran Misión Hogares de la Patria".

(5) The official statistic of beneficiaries just covers the program "Misión Ribas".

(6) The official statistic of beneficiaries cannot be compared with survey statistics because is form 2009 and the noncontributory pension started in 2012.

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