

Simulating Personal Income Tax Reforms and Fiscal Gains in the Andean Region

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María Cecilia Deza Delgado
H. Xavier Jara
Nicolás Oliva
Javier Torres

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Contacts: Maria Cecilia Deza: MDEZA@iadb.org; H. Xavier Jara: hxjara@essex.ac.uk.

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María Cecilia Deza Delgado, H. Xavier Jara, Nicolás Oliva, and Javier Torres*

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Abstract

The aim of this paper is to assess the budgetary and distributional effects of tax policy reforms in five Andean countries: Bolivia, Colombia, Ecuador, Peru, and Venezuela. The analysis makes use of harmonized multi-country tax-benefit microsimulation models to allow cross-country comparability and to assess the effect of exporting income tax policies across countries. More precisely, three counterfactual simulations are used to apply the personal income tax (PIT) systems of Uruguay, Spain, and Italy to each of the five Andean countries in order to assess their effect on government revenue and income redistribution with respect to the national systems. Based on this benchmarking exercise, potential pathways are explored to reform specific components of PIT to increase fiscal capacity in the Andean region. The results show important gains in fiscal capacity and inequality reduction under the three policy-swap scenarios; however, given the static nature of the framework, potential effects on formal work incentives in the medium term cannot be ruled out. Abolishing deductions from national PIT systems in Andean countries would have a smaller although positive effect on tax revenue and could represent the first step toward more sustainable and equitable fiscal policies in the region.

Keywords: taxes, informality, fiscal capacity, inequality, microsimulation
JEL classification: I32, I38, H24, D13

* Authors' affiliations and emails (respectively): Inter-American Development Bank (mdeza@iadb.org), University of Essex – Institute for Social and Economic Research (hxjara@essex.ac.uk), Centro Estratégico Latinoamericano de Geopolítica (CELAG) (nicolasolivap@gmail.com), and Universidad del Pacífico (J.TorresGomez@up.edu.pe). The results presented here are based on three projects: (i) LATINMOD, a project sponsored by CELAG, funded by BANDES and with the collaboration of EUROMOD; (ii) ECUAMOD v1.4, developed, maintained, and managed by UNU-WIDER in collaboration with the EUROMOD team at ISER (University of Essex), SASPRI (Southern African Social Policy Research Institute), and local partners in selected developing countries (Ethiopia, Ghana, Mozambique, Tanzania, Zambia, Ecuador, and Viet Nam) in the scope of the SOUTHMOD project and local partner for ECUAMOD Instituto de Altos Estudios Nacionales (IAEN); (iii) COLMOD v1.2, a project developed and managed by the Faculty of Economics at Universidad Externado de Colombia. We are indebted to the many people who have contributed to the development of LATINMOD, SOUTHMOD, ECUAMOD, and COLMOD. We are grateful to David Rodríguez and Adrian Hernández Martín for their helpful assistance and comments. The results and their interpretation presented in this publication are solely the authors' responsibility.

1. Introduction

It is a stylized fact that tax revenues in Latin America and the Caribbean (LAC) are low compared to those in advanced economies, and in the countries in the Andean region tax collection is even lower: 20.9 percent of GDP in 2015 compared to 22.8 percent of GDP in LAC and 34.3 percent of GDP in the typical OECD country (OECD/ECLAC/CIAT/IDB, 2017). It is also known that the bulk of the difference is due to a significantly lower reliance on direct taxation in LAC compared to OECD countries, which is a consequence of higher levels of informality in LAC as well as the generosity of the design of the personal income tax (PIT) system regarding thresholds, exemptions, and deductions to pursue progressivity. In 2015, taxes on income and profits represented 27.1 percent of total tax revenue (similar to the LAC average) compared to 33.7 percent in OECD countries. Regarding PIT, collection from this tax represented only 8.7 percent of total tax revenue in the LAC region compared to 24 percent in OECD countries.

This paper aims to assess the budgetary and distributional effects of tax policy reforms in five Andean countries (Bolivia, Colombia, Ecuador, Peru, and Venezuela) with the objective of exploring pathways to increase fiscal capacity in the region. For this, we make use of multi-country tax-benefit microsimulation models based on nationally representative household survey data: COLMOD (Colombia), ECUAMOD (Ecuador), PERUMOD (Peru), and LATINMOD (Bolivia and Venezuela). The models have been developed within the EUROMOD framework to ensure cross-country comparability through data and modelling language harmonization (see Sutherland and Figari, 2013). The empirical analysis consists of two parts. First, a benchmarking exercise is performed, whereby the PIT systems of Uruguay, Spain, and Italy are applied to each of the five Andean countries. Such benchmarking exercises are technically straightforward to implement thanks to the harmonized modelling language adopted in the microsimulation models and allow assessing which differences in the design of PIT explain the gaps in the budgetary and redistributive effects of income tax in the national system compared to the benchmark. Then, based on the lessons learned from the benchmarking exercise, country-specific reforms that could increase fiscal capacity are analyzed.

The results show that exporting the Uruguayan, Spanish, and Italian PIT tax systems to the five Andean countries would have large budgetary and distributional effects, although to different extents in each country. A common pattern is observed across countries, with the Italian system yielding the largest fiscal effects, followed by the Spanish and Uruguayan systems. On average, tax revenue would double under the Uruguayan system, and it would be around 5 times higher under the Spanish system and 10 times higher under the Italian scenario. The largest reductions in inequality would be observed in Colombia, particularly under the Italian system, where the Gini coefficient would drop by 6 percentage points (from 56.4 to 50.4 percent). Significant gains in progressivity could also be achieved in Bolivia, whose current PIT system, linked to the VAT (Régimen Complementario del IVA, or RC-IVA), significantly limits its collection capacity (RC-IVA yields less than 0.5 percent of GDP in revenues; see Appendix A1 for a description of the scheme). Based on this benchmarking exercise, the country-specific counterfactual scenario simulates the abolishment of tax deductions from the design of national PIT systems. Still under this scenario, tax revenue would increase by 12 to 45 percent in most Andean countries. In Colombia, the counterfactual simulation also consists of bringing down the exempted threshold to levels similar to those observed in other countries and tax revenue would more than triple under such scenario.

This work contributes to the literature discussing potential pathways to increase fiscal capacity in developing countries in view of ensuring sustainable growth and social protection. Our analysis

also provides insights into the budgetary and distributional effects of tax expenditures in developing countries. This strand of the literature remains relatively unexplored due to the lack of data or tools to provide empirical evidence. In this sense, we show the advantages of microsimulation models to assess the impact of abolishing tax-related deductions in a comprehensive way.

The paper is organized as follows: Section 2 compares tax statistics in the Andean region and provides a brief overview of the PIT systems in the countries under analysis. Section 3 presents the models and data used in the analysis. Section 4 presents the results of the policy-swap benchmarking exercise. Section 5 provides analysis of the effects of abolishing tax deductions from the design of national income taxes in the region. Finally, Section 6 concludes.

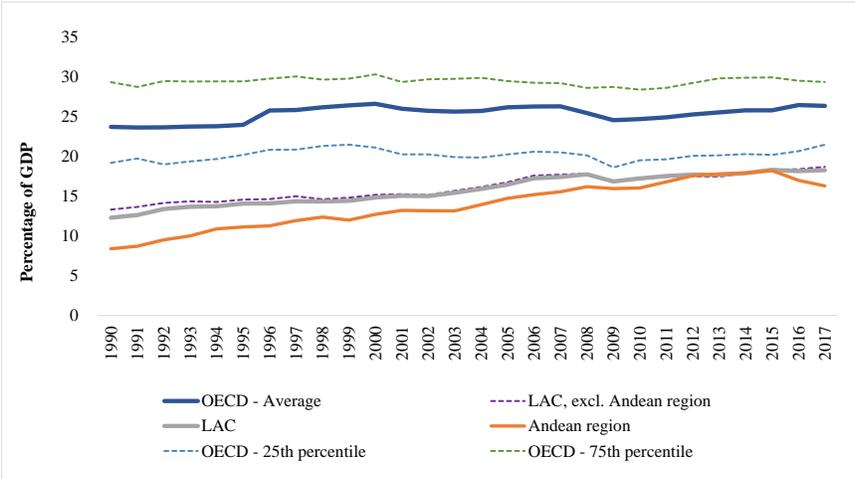
2. PIT Systems in the Andean Region

This section provides a brief overview of the PIT system of each of the countries under study. It starts with a review of the evolution of the tax revenues in the Andean countries in the last decade compared to other regions, and then compares the main parameters of the PIT system in the countries under study.

2.1. Comparative Statistics on Tax Revenue

The Andean region has shown a secular pattern of low tax collections. In fact, as reported in Figure 1, countries in the Andean region have the lowest tax collection ratios relative to OECD countries with different levels of income, as well to other countries in the LAC region. The typical Andean country collected 14 percent of GDP in taxes in the period 2000–2017, while the average LAC country, excluding Andean countries for comparison, collected 16 percent of GDP. Within the OECD, countries in the 25th percentile collected about 20 percent of GDP in taxes and those in the 75th percentile of income had ratios of 29 percent of GDP. On average, OECD tax collection was 25 percent of GDP. Since 1990, tax revenues in the Andean countries have been increasing, and at a higher speed during the boom commodity prices. However, starting in 2015 the pattern reversed and tax revenues started to decline, which has not been seen in other regions.

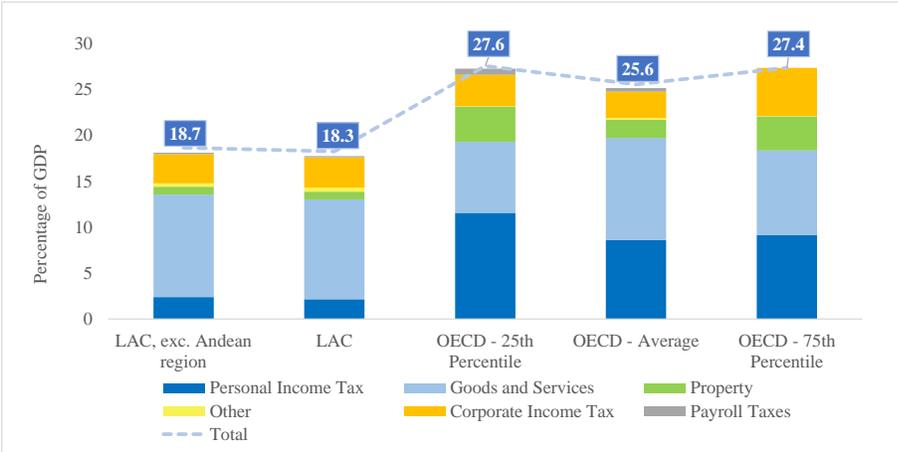
Figure 1. Evolution of Tax Revenues in Andean Region and Selected Regions (1990–2017)



Source: Authors' elaboration based on data from OECD/ECLAC/CIAT/IDB (2017).
 Note: Simple average of each group of countries. Corresponds to the sum of tax collection of the central and subnational governments. Excludes Social Security contributions. LAC and Andean region excludes Venezuela due to the lack of available data. OECD averages exclude Chile and Mexico. Figures are net from refunds.

By composition of taxes, Figure 2 reveals some important differences in the tax structure across regions. In general, both LAC and OECD countries seem to rely on goods and services taxes for tax collection in an important way; in fact, around half of the tax collection in all regions comes from taxes on goods and services (i.e., the VAT). Also, the ratio of corporate income taxes over GDP seems to be similar across regions; in particular, in Andean countries, which are mainly producers of non-renewable natural resources, corporate income tax has been linked to the cycle of commodity prices. As mentioned before, the biggest differences are seen in PIT and property tax, due to a wider base of taxpayers and a less generous scheme for the PIT in advanced countries and to a great capacity to collect property taxes at the subnational level in those countries.

Figure 2. Composition of Tax Revenues in the Andean Region and Selected Regions (2017)



Source: Authors' elaboration based on data from OECD/ECLAC/CIAT/IDB (2017).
 Note: Simple average of each group of countries. Corresponds to the sum of tax collection of the central and subnational governments. Excludes Social Security contributions. LAC and Andean region exclude Venezuela due to the lack of available data. OECD averages exclude Chile and Mexico. Figures are net from refunds.

2.2. A Brief Overview of the Design of PIT in the Andean Region

Table 1 presents a summary of the parameters of the PIT system in the Andean countries. The main difference that arises across systems is the width of the tax base: Andean countries start taxing income at levels equivalent to 2 (Peru) to 4 (Colombia) annualized minimum wages. Similarly, maximum rates are reached at a range between 7 (Venezuela) and 26 (Ecuador) annualized minimum wages. Additionally, tax brackets are also generous in Andean countries: they start at 0 percent in Colombia and Ecuador and reach a maximum of 8 percent (Peru). It is also noted that the number of tax deductions available in the PIT design of the Andean countries is mostly composed of expenditures in education, health, and housing. As a comparison, Table 3 (in Section 3.2) reports these same parameters for the sample of countries that will be used as a benchmark in the simulation exercise: Uruguay, Spain, and Italy. It can be seen that the limits of both the highest and the lowest tax bands are significantly lower in Spain and Italy compared to the Andean countries. Also, the gap between the highest and the lowest tax rates is around 20 percentage points in Spain and Italy, lower than in the Andean countries, which means that individuals in the lower brackets in the benchmark developed countries are also taxed at a higher rate than in the Andean countries. Due to this higher taxation, Spain and especially Italy introduce a series of income deductions for tax purposes. The parameters in Uruguay are more like those seen in Andean countries, but tax deductions are more limited.

Table 1. Main Characteristics of PIT Systems in the Andean Region (2015)

Country	Tax unit	Lowest tax band limit	Highest tax band limit	Lowest tax rate (%)	Highest tax rate (%)	Tax deductions
Bolivia	individual	-	-	13 (flat)	-	All billed expenditures
Colombia	individual	4.0	15.0	0	33	Expenditures in education, health, and mortgage payments
Ecuador	individual	2.5	25.9	0	35	Expenditures in food, clothing, education, health, and housing
Peru	individual	2.1	23.5	8	30	-
Venezuela	individual (couples optional)	1.8	7.1	6	34	Expenditure in education, health, and mortgage payments (or unique deduction of 774 tax units)

Source: Authors' elaboration based on the 2015 legislation of the Personal Income Tax (PIT) and the legal minimum wages in each country.

Note: Tax bands are expressed in terms of annualized minimum wages in each country.

2.3. Comparative Statistics on the Redistributive Effect of PIT

One of the roles of fiscal policy, along with providing macroeconomic stabilization and fostering long-term economic growth, is to help tackle inequality. Fiscal policy affects inequality via tax and expenditure policies. Concerning tax policies, PIT, through a progressive design, might improve income redistribution by imposing a relatively greater tax burden on those whose earnings are higher. On the other hand, indirect taxes provide a sustainable and ample source of revenues for most countries in the world but might end up being regressive. For this reason, several countries introduced cash transfer policies targeted to poorer individuals, in part to mitigate this burden, along with other social expenditures such as education and health. In summary, the extent of the redistributive effect depends on both the magnitude of progressivity of taxes and the generosity of social expenditures.

LAC remains the most unequal region in the world, with a Gini coefficient of 51.5 percent, compared to 48.8 percent in advanced economies, before fiscal policy (Izquierdo, Pessino, and Vuletin, 2018). It is also known that in LAC countries, the redistributive power of fiscal policies has come mostly from the expenditure side, namely social benefits, transfers, and subsidies, among others, due to the low proportion of workers that pay PIT and the low progressivity of the design of the PIT system among those who pay. In contrast, in advanced countries, the redistributive power of fiscal policy comes from both, especially direct taxes and pensions (IMF, 2017).

Several studies have measured the extent to which the different components of the fiscal policy in LAC have impacted redistribution. The most common approach to assess this issue is through

the fiscal incidence method,¹ which makes assumptions on who ultimately bears the burden of taxes and is based on information from the national household surveys. The method helps determine whether a fiscal policy component is equalizing (improves redistribution), but also whether it is pro-poor or pro-rich, based on the concentration coefficient of the transfer. As pointed out in Lustig (2018), in a sample of 16 LAC countries, most of the components of the fiscal policy (contributive pensions, subsidies, transfers, and social expenditure in health and education) reduce inequality; however, there is more heterogeneity regarding the impact of fiscal policy on poverty reduction, and the extent of the redistribution varies between countries, even between those with similar levels of expenditure, which suggest differences regarding targeting and expenditure composition. On the other hand, according to a similar analysis presented in Izquierdo, Pessino, and Vuletin (2018), in LAC, fiscal policy has reduced the Gini coefficient from 51.5 percent to 49 percent, while in advanced economies it went from 47 percent to 28 percent. The authors argue that the size of pensions (contributory and non-contributory) and social transfers explain these differences in redistribution.

Similarly, Arancibia et al. (2019) analyze the impact of tax-benefit systems on income redistribution in six LAC countries using microsimulation techniques and find a significant heterogeneity in the effect of fiscal policy on inequality, measured by the difference between the Gini coefficient from market income to disposable income. Their simulations suggest that Uruguay is the most redistributive, reducing the Gini by more than 10 percentage points, while Colombia and Bolivia are the least so, reducing the Gini coefficient by less than 3 percentage points. While the redistributive role of PIT remains limited, Uruguay is the country where its marginal contribution to inequality reduction is the largest, achieving a decrease in the Gini coefficient of 1.6 percentage points. Thus, direct taxation has a vast unexploited potential to boost both fiscal revenues and fiscal space and induce a better redistribution of income, if properly designed.

3. Methodology

The analysis makes use of tax-benefit microsimulation models for Latin American countries, based on nationally representative household survey data. This section describes the data and microsimulation models used in the analysis, the scope of the simulations, and modeling assumptions. Then, it provides a description of the counterfactual policy-swap exercises.

3.1. Data and Microsimulation Models

The analysis makes use of harmonized multi-country tax-benefit microsimulation models for Latin American countries based on household survey data; the models are COLMOD (Colombia), ECUAMOD (Ecuador), PERUMOD (Peru), and LATINMOD (Bolivia and Venezuela).² Tax-benefit

¹ The fiscal incidence method assesses the fiscal policy impact by calculating the difference between the Gini coefficient of pre- and post-fiscal income. This is also a static analysis, since it does not take into account potential behavioral changes.

² The model for Ecuador, ECUAMOD, has been developed and is maintained as part of the SOUTHMOD project (Decoster et al., 2019). For more information see Jara and Varela (2019) and <https://www.wider.unu.edu/project/southmod-simulating-tax-and-benefit-policies-development>. The model for Colombia, COLMOD, is developed and maintained by the Faculty of Economics at Universidad Externado de Colombia. For more information see Rodríguez (2019) and <https://www.uexternado.edu.co/economia/colmod-el-primer-modelo-de-microsimulacion-en-colombia/>. The models for Bolivia and Venezuela have been developed as part of the LATINMOD project. LATINMOD is a regional tax-benefit microsimulation model for six Latin American countries (Argentina, Bolivia, Mexico, Paraguay, Uruguay, and Venezuela). For more information about LATINMOD see Arancibia et al. (2019) and Oliva (2018). The model for Peru, PERUMOD, has been developed as part of the project

microsimulation combines country-specific coded policy rules with representative household microdata to simulate, among others, direct taxes, social insurance contributions (SICs), and cash transfers for the household population in each country. All models have been implemented within the structure of the EUROMOD software and follow the EUROMOD modelling conventions in order to ensure cross-country comparability through harmonization of the micro datasets and a common modelling language for the simulations of policy instruments (EUROMOD, 2018; Sutherland and Figari, 2013). All models are static in the sense that tax-benefit simulations abstract from behavioral reactions of individuals and no adjustments are made for changes in the population composition over time.

For the purpose of the simulations, the analysis makes use of nationally representative 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. Table 2 summarizes the information about the microsimulation models and data used in the analysis.³

Table 2. Data Sources and Microsimulation Models

Country	Data source	Year of data collection	Number of individuals	Number of households	Microsimulation model
Bolivia	Encuesta Nacional de Hogares (EH)	2015	37,364	10,171	LATINMOD-Bolivia
Colombia	Encuesta Nacional de Calidad de Vida (ENCV)	2014	67,332	20,141	COLMOD
Ecuador	Encuesta Nacional de Ingreso y Gastos de Hogares Urbanos y Rurales (ENIGHUR)	2011–2012	153,341	39,617	ECUAMOD
Peru	Encuesta Nacional de Hogares (ENAHO)	2018	126,673	37,462	PERUMOD
Venezuela	IV Encuesta Nacional de Presupuestos Familiares (ENPF)	2009	158,840	37,122	LATINMOD-Venezuela

Source: Authors' elaboration based on SOUTHMOD, LATINMOD, COLMOD, and PERUMOD documentation.

The present analysis takes 2015 policies (as on June 30th of that year) in all countries as the starting point. In the case where the data year does not match the policy year, market incomes and non-simulated tax-benefit variables are adjusted to 2015 levels using source-specific updating factors (Jara et al., 2019). The remainder of this section briefly describes the scope of

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³ Data adjustments for use in the microsimulation models are kept to a minimum. In particular, a minimum number of observations for domestic workers living in their employer's household have been dropped as it is not possible to link them with information about their own households. An important shortcoming of the survey in Venezuela is that information about the relationship of the household members with respect to the head of the household is not released. Therefore, we have imputed information on mother and father identifiers for children under 18 based on information about age, gender, and education of adult household members.

the simulations and the underlying assumptions used in each country for the different policy instrument.

Scope of the simulations, assumptions, and caveats. This analysis focuses on the concept of disposable income, defined as market income minus direct taxes and SICs plus cash benefits and pensions.⁴ In all countries, the main policy components of disposable income have been simulated, including: employee and self-employed SICs, PIT, and the main cash transfer programs of the country.⁵ Due to data limitations, some tax-benefit instruments cannot be simulated and are included directly from the data as part of disposable income. These include contributory benefits such as public pensions and severance payments, which cannot be simulated due to the lack of information on contribution records; disability benefits due to insufficient information on the severity of disability; and property taxes and motor vehicle taxes due to the absence of information about property and vehicles' value in the data; among others. Apart from contributory pensions, all other non-simulated instruments represent a minor part of disposable income in the countries under study.

In order to account for the presence of informal employment in the countries of analysis, a harmonized approach is used to simulate SICs and PIT payments under partial compliance. More precisely, in all countries, employee and self-employed SICs are simulated only for workers reporting affiliation to social security in the survey. In Peru, only health insurance contributions are simulated for the self-employed, assuming that they do not contribute to a pension's fund (neither public nor private). In Venezuela, voluntary self-employed contributions are simulated for those reporting affiliation to social security, but it is assumed that they pay the minimum contribution (based on the minimum wage) independently from their level of earnings.⁶ For the simulation of PIT, we follow a similar approach and assume that only workers affiliated to social security pay taxes. Note that, in countries like Ecuador and Venezuela, where SICs are voluntary for the self-employed, our assumption could be considered stringent as some of the self-employed not affiliated to social security could in fact be PIT. In Bolivia, this assumption is relaxed for the self-employed, where PIT is simulated also for those registered in the general or simplified tax regimes.

An important limitation in the use of household survey data for the analysis of income taxation is the presence of top income undercoverage (Atkinson, Piketty, and Saez, 2011; Burkhauser et al., 2012; CEPAL-IEF, 2014). A growing number of studies have attempted to correct survey income data to better represent the top of the distribution (Bach, Corneo, and Steiner, 2009; Burkhauser et al., 2016; DWP, 2015; Jenkins, 2017; Hlasny and Verme, 2018). Ideally, such adjustments would make use of detailed tax records data. Unfortunately, tax records data is not publicly

⁴ Market income is defined as the sum of employment and self-employment income, bonuses, in-kind income, own consumption from self-employment activities, capital and property income, inter-household payments, private transfers, minus alimony payments. Imputed rent is not included as part of market income.

⁵ The following cash transfers are simulated in our models: Bono Juancito Pinto, Bono Juana Azurduy, and Renta Dignidad in Bolivia; Familias en Acción and Colombia Mayor in Colombia; Bono de Desarrollo Humano and Bono Joaquín Gallegos Lara in Ecuador; Juntos in Peru; Misiones Educativas: Robinson (I y II), Ribas y Sucre, and Gran Misión en Amor Mayor Venezuela in Venezuela.

⁶ In Venezuela, the social security law establishes the voluntary contribution of self-employed workers with a tax rate of 13 percent of declared income. In this case, the declared income is self-defined by workers but cannot be less than the minimum wage. Although no public information is available, assuming all affiliated self-employed contribute on the basis of the minimum wage seems a realistic assumption given the low SIC revenue in Venezuela.

available for the countries under analysis. For this reason, our results are based purely on income as reported in household surveys.

3.2. Exporting Policy Instruments across Countries

The benchmarking exercise consists of applying PIT policies from other countries—considered references for the Andean region—to the five countries under study. More precisely, the PIT systems from Uruguay, Spain, and Italy are applied to each of the five Andean countries under study in order to assess their budgetary and distributional effects compared to the countries' national income tax systems. These counterfactual simulations are “adjusted” policy swaps in the sense that they account for the fact that the countries under analysis differ in level of development by adjusting all monetary parameters of the imported PIT system to the living standards of the “importing” country. Such benchmarking exercises are technically straightforward to implement thanks to the harmonized modelling language adopted in our models and allow assessing which differences in the design of PIT explain the gaps in the redistributive and budgetary effect of income tax in the national system compared to the benchmark. However, these counterfactual simulations should be taken with care because they represent substantial changes to the existing instruments and are likely to influence changes in individual behavior, for instance in terms of labor supply choices, which are not considered within this static setting. As such, the counterfactual simulations performed here should be considered an upper bound in terms of tax collection and new taxpayers, and a partial or customized adoption of the design of the PIT in benchmark countries could be more advisable as it would still yield important gains in terms of fiscal space, tax base, and, especially, distribution of the tax burden, with positive effects on the progressivity of the system. Section 5 reports the results of performing country-specific tax reforms.

Similar exercises have been performed previously for European countries but focused on unemployment benefit schemes (De Lathouwer, 1996) or on child and family benefits (Atkinson, Bourguignon, and Chiappori, 1988; Levy, Lietz, and Sutherland, 2007; Salanauskaite and Verbist, 2013). More recent studies have also exploited the full capacity of the models to simulate a swap of the whole tax-benefit system between pairs of countries. See, for instance, Bargain, Jara, and Rodríguez (2017) for a complete system swap between Ecuador and Colombia, and Bargain et al. (2019) for swaps of tax-benefit systems across six African countries.

The main characteristics of the PIT in Uruguay, Spain, and Italy in 2015 are described in Table 3 and summarized below. A more detailed description of the policies is presented in Appendix A.

Table 3. Main Characteristics of PIT Systems in Uruguay, Spain, and Italy (2015)

Country	Tax unit	Lowest tax band limit	Highest tax band limit	Lowest tax rate (%)	Highest tax rate (%)	Tax deductions/tax credits
Uruguay	individual	2.1	35.1	0	30	Tax deductions for children
Spain	individual	1.5	7.7	19	43.5	Tax credits based on personal and family circumstances
Italy	individual	1.5	7.5	23	43	Tax credits for personal expenses (health, education, commuting, among others), economic incentive purposes, income source, family circumstances

Source: Authors' elaboration based on the 2015 legislation of the Personal Income Tax (PIT) and the legal minimum wages in each country.

Note: Tax bands are expressed in terms of annualized minimum wages in each country. Spanish tax rates are based on the national tax schedule and the regional schedule of Madrid. Italian tax rates are based on the national tax schedule and the basic 0.9 percent regional rate.

For the purposes of the microsimulation exercises, in which the entire PIT system from one country is exported to another, it is worth comparing the parameters of the design of the PIT of the exporting country in terms of the living standards of the importing country. In this section, and for the sake of brevity, the PIT parameters of Uruguay, Spain, and Italy are compared to the living standards of one Andean country, Ecuador.

Uruguay. The structure of the PIT schedule in Uruguay is, at first sight, similar to that of Ecuador, with seven tax bands and tax rates between 0 and 30 percent. However, if the values of the tax bands are expressed in terms of Ecuadorian minimum wages, one can observe that the exempted threshold is much lower in Uruguay, representing 1 annualized minimum wage compared to 2.5 annualized minimum wages in Ecuador. Additionally, the 30 percent tax rate in Uruguay applied to incomes of lower levels than in Ecuador. The value of the highest tax band in Uruguay represents 16.2 annualized minimum wages, whereas that of Ecuador represents 25.9 annualized minimum wages.

In addition to the structure of the tax schedule, the Ecuadorian PIT differs from that of Uruguay in terms of tax deductions. In Ecuador, deductions for personal expenditures can be applied to the calculation of taxable income. Such deductions do not exist in Uruguay. On the other hand, deductions for children are applied in Uruguay but not in Ecuador.

Spain. The differences in the structure of the tax schedules of Ecuador and Spain are noticeable. First, the tax schedule in Spain is not characterized by an exempted threshold as such. The lowest tax rate of 19 percent applies to incomes lower than 12,450 euros per year (equivalent to 1.1 annualized Ecuadorian minimum wages adjusted by differences in earnings between the two countries). However, different tax allowances are applied.

The tax schedule in Spain is set by the state and by each autonomous region. The state sets a common progressive tax schedule and each autonomous region sets its own regional schedule, which is then added to the state tax schedule. The simulations consider both the state and regional tax schedules, taking as reference the region of Madrid. In 2015, the tax schedule was

characterized by tax rates between 19 and 43.5 percent. It is important to highlight that not only are tax rates higher in Spain than in Ecuador but also the level of income to which the highest tax rate applies is much lower in Spain than in Ecuador. In Ecuador, the highest tax rate is applied to incomes equivalent to 25.9 annualized minimum wages or higher, whereas the highest tax band in Spain is equivalent to 5.2 annualized Ecuadorian minimum wages (adjusted by differences in earnings between the two countries).

As was the case in Uruguay, no deductions for personal expenditures apply to the Spanish PIT system. However, the Spanish PIT takes into account personal and family circumstances of the taxpayer by means of tax credits, which are deducted from the tax base after the tax schedule has been applied to it. Note that in case the amount corresponding to tax credits exceeds the amount corresponding to tax liabilities, the remaining amount can be received as a benefit (negative tax). The simulations in this paper, however, assume that individuals do not receive transfers in case the amount of tax credits exceeds the tax liabilities in order to prevent overly large income effects for low-income individuals in the context of Andean countries.

Italy. The PIT schedule in Italy is also much more progressive than in Ecuador. As in the case of Spain, the tax schedule in Italy is not characterized by an exempted threshold as such. The lowest tax rate of 23 percent already applies to incomes lower than 15,000 euros per year (equivalent to 1.1 annualized Ecuadorian minimum wages adjusted by differences in earnings between the two countries). However, different tax allowances are applied.

In 2015, the PIT schedule was characterized by tax rates between 23 and 43 percent. As in the case of Spain, an additional regional tax is applied to the general tax schedule in Italy. The simulations take the most common regional additional tax rate, which is 1.23 percent on top of the PIT schedule. Expressing the top tax band in Italy in terms of minimum wages, one observes that the 43 percent tax rate applies to incomes above 5.2 annualized Ecuadorian minimum wages, adjusted by differences in earnings between the two countries.

The Italian PIT is also characterized by the presence of tax credits. All tax credits are non-refundable; therefore, the tax liability cannot be negative. Tax credits can be classified into four categories that apply independently: (i) tax credits for personal expenses (health, education, commuting, among others); (ii) tax credits with economic incentive purposes; (iii) tax credits for income source; and (iv) tax credits for family circumstances.

4. PIT Swaps

This section presents the budgetary and distributional effects of exporting the PIT systems of Uruguay, Spain, and Italy to five countries in the Andean region: Bolivia, Colombia, Ecuador, Peru, and Venezuela. The results focus, in particular, on the effect of the policy swap on the number of taxpayers, tax revenue, average effective tax rates, and the Gini coefficient, compared to the baseline in each country. As mentioned previously, the aim of this exercise is to compare the performance of national tax systems with respect to different benchmarks to provide room for discussion about reforms at the country level. Analysis of the country-specific scenarios is presented in Section 5.

4.1. Budgetary Effects

Table 4 presents PIT revenue under the baseline and reform scenarios for the countries under analysis. In all countries, the counterfactual simulations show important gains in terms of tax revenue, although to different extents in each country. In all countries, a similar trend is observed, with the Italian tax system yielding the largest effects, followed by the Spanish system, while the Uruguayan PIT has the smallest (though still positive) impact.

The largest effect of applying the Uruguayan PIT is observed in Bolivia, Colombia, and Peru, where tax revenue would more than double: from 0.62 to 1.63 percent of GDP in Bolivia, from 0.43 to 0.93 percent of GDP in Colombia, and from 0.65 to 1.6 percent of GDP in Peru. The effect would also be large in Ecuador with an increase in tax revenue from 0.72 percent to 1.42 percent of GDP. Venezuela would experience the smallest increase in tax revenue under the Uruguayan tax system, with a 20 percent increase in tax revenue (from 0.8 to 0.97 percent of GDP). The small effect in Venezuela is due to the fact that the misalignment between the evolution of prices and wages and the parameters of the PIT (the Unidad Tributaria, or UT) makes the structure of the PIT similar to that in more developed countries in terms of progressivity. This can be seen, for instance, if the levels of tax bands in Venezuela and Uruguay are compared (Tables 1 and 2). The exempted tax threshold in Venezuela looks similar to that of Uruguay. The effect of the Uruguayan tax system applied to Venezuela would therefore capture mainly the differences in terms of the structure of tax deductions between the two countries.

The Spanish PIT system has a much larger effect than the Uruguayan one in all countries. Adopting the Spanish tax system would more than double tax revenue in all Andean countries. Bolivia, Colombia, and Peru would experience the largest effect, with tax revenues five times higher than under the national baseline. The effect would also be large in Ecuador with an increase in tax revenue from 0.72 to 3.29 percent of GDP. As was the case under the Uruguayan scenario, the smallest increase would be observed in Venezuela (from 0.8 to 1.85 percent of GDP).

Finally, the largest effect in all countries is observed under the Italian tax system. Tax revenue would increase by more than eight times in all countries, except in Venezuela. The increase in Venezuela would, however, still be substantial, with tax revenue rising by almost four times from 0.80 to 3.11 percent of GDP.

We now turn to the effect of the policy swap in terms of taxpayers. Table 5 shows the number of taxpayers under the baseline and reform scenarios for all countries under analysis. The pattern in terms of taxpayers follows closely that of tax revenue. In all countries, the counterfactual simulations show important gains in terms of the number of taxpayers, but to varying degrees. The Italian tax system yields the largest effects, followed by the Spanish system, while the Uruguayan system has the smallest effect.

Even though the Uruguayan PIT has the smallest impact compared to the Spanish and Italian systems, its effect would be substantial in Colombia, where the number of taxpayers increases from 2.89 to 22.34 percent of the working-age population. The large effect is explained by the fact that the exempted tax threshold is very high in Colombia, representing 4 annualized minimum wages, which means that effectively, a reduced number of individuals are liable to pay income tax. The effect is also large in Bolivia and Ecuador, where the number of taxpayers would be more than three times higher under the Uruguayan scenario. The smallest effects are observed in Peru

and Venezuela, where the number of taxpayers under the Uruguayan PIT would increase by 68 percent and 11 percent, respectively.

As mentioned before, the Italian tax system yields the largest effects. In Colombia, for example, the number of taxpayers soars from 2.89 percent of the working-age population to 43.3 percent (15 times higher than the baseline) when the Italian system is applied. The effect would also be high in Bolivia and Ecuador, where the number of taxpayers would be more than five times larger than under the national system. Although smaller than in other countries, the effect of the Italian PIT would also result in an important increase in the number of taxpayers in Peru and Venezuela, where it would more than double. Finally, the Spanish tax system has an intermediate effect in all five countries, with a larger impact than the Uruguayan PIT but smaller than the Italian.

Table 4. Total Tax Revenue under the Baseline and Policy-Swap Scenarios (2015)

	BOLIVIA		COLOMBIA		ECUADOR		PERU		VENEZUELA	
	Total (millions LCU)	Total (% GDP)								
Scen. baseline	1,411	0.62	3,472,547	0.43	713	0.72	3,936	0.65	64,636	0.80
Scen. Uruguay	3,717	1.63	7,467,399	0.93	1,413	1.42	9,754	1.60	77,869	0.97
Scen. Spain	7,576	3.32	21,662,146	2.69	3,271	3.29	24,019	3.94	149,031	1.85
Scen. Italy	13,812	6.06	37,107,981	4.61	7,293	7.35	51,309	8.42	250,352	3.11

Source: Authors' elaboration based on microsimulation models.

Note: LCU denotes local currency units.

Table 5. Number of Taxpayers under the Baseline and Policy-Swap Scenarios (2015)

	BOLIVIA		COLOMBIA		ECUADOR		PERU		VENEZUELA	
	Total (thousands)	Total (% WAP)								
Scen. baseline	211	4.15	388	2.89	349	4.65	1624	9.84	1574	11.14
Scen. Uruguay	706	13.91	3005	22.34	1306	17.42	2736	16.58	1748	12.36
Scen. Spain	945	18.62	4147	30.83	1390	18.53	3955	23.97	2219	15.70
Scen. Italy	1242	24.47	5855	43.53	2309	30.79	7362	44.62	3435	24.30

Source: Authors' elaboration based on microsimulation models.

Note: WAP denotes working-age population (15+ years).

4.2. Average Effective Tax Rates

Another important feature to analyze is the effect of the counterfactual simulations on average effective tax rates (AETR). Here, AETR measures the burden of PIT liabilities as a percentage of taxable income. In order to provide an idea of the progressivity of PIT under the baseline and counterfactual scenarios, we provide results of AETR by deciles of per capita household disposable income and by socioeconomic status.

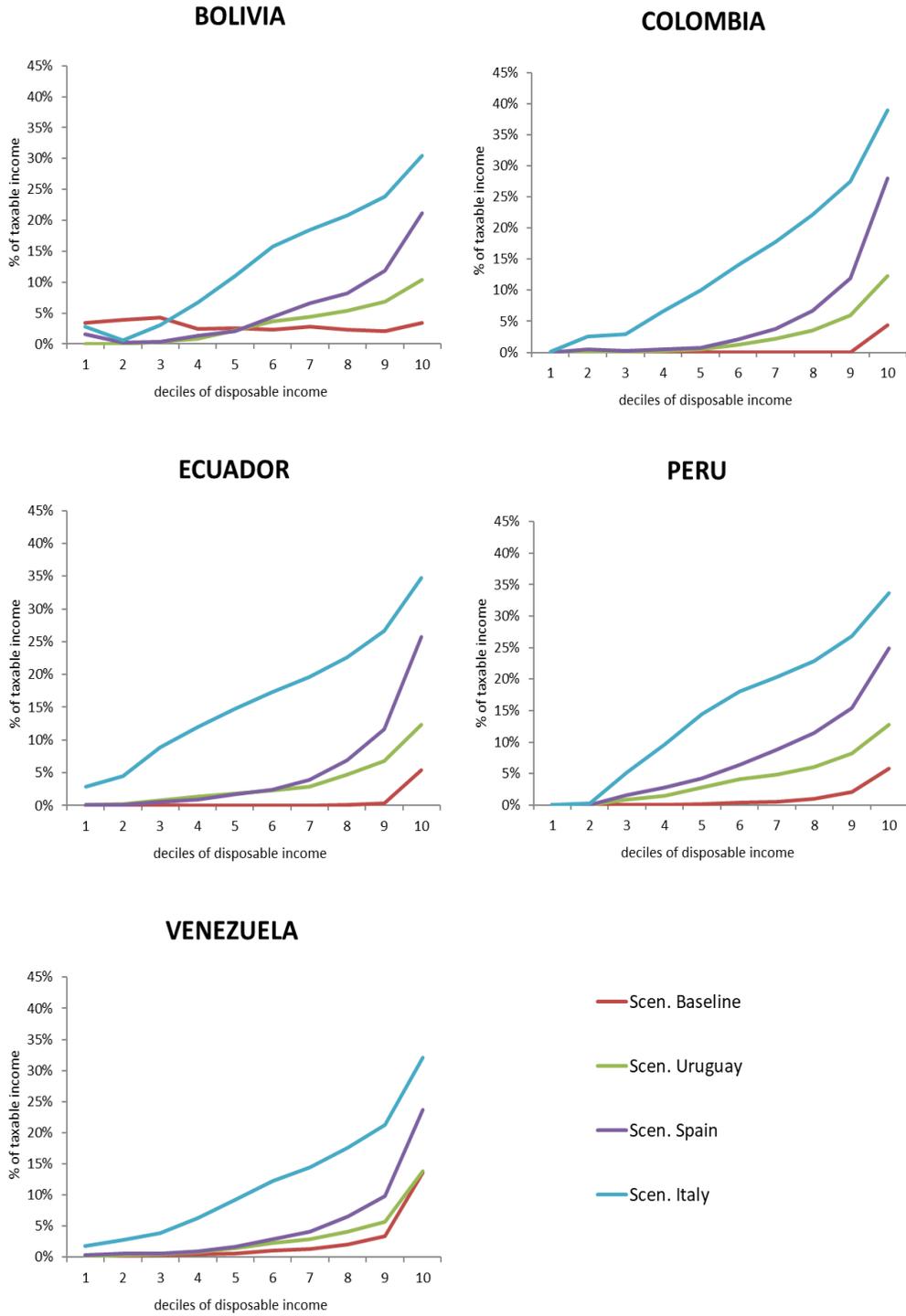
Figure 3 presents AETR by deciles of per capita household disposable income, where deciles are based on per capita household disposable income in the baseline scenario. The results show that in all countries the national income tax systems are fairly flat across income deciles or slightly progressive (red line), except in Bolivia, where the tax systems seem to be somewhat regressive, with the lowest decile of income facing a greater tax burden. In these countries, taxes are largely concentrated at the top of the distribution. The highest effective tax rates are observed in the 10th decile although they are still rather low, amounting to 3 to 5 percent of taxable income in most countries, except in Venezuela, where it is 13.6 percent. As mentioned, the case of Bolivia is particular, with a rather flat effective tax rate of around 3 to 4 percent across the whole distribution. The latter is due to the absence of a direct and progressive income tax system in Bolivia, where income taxation depends on the source of income (employment or self-employment) with a unique rate of 13 percent. Also, since individuals in Bolivia can deduct purchases provided that they paid the corresponding VAT, it is possible that those in the highest deciles and with more purchasing capacity are the most benefitted in this regime.

Under the counterfactual scenarios, average effective tax rates increase along the distribution of disposable income and the pattern becomes steeper, which means a more progressive performance of the PIT. In general, average effective tax rates start becoming more pronounced from the third decile under the Uruguayan and Spanish systems, whereas the effect of the Italian system becomes visible from the very first decile. At the top of the income distribution, average effective tax rates increase substantially. The largest increase is observed under the Italian system, followed by the Spanish and the Uruguayan. Under the Uruguayan tax system, the average effective tax rate for the top decile would more than double in all countries except Venezuela, where the highest increase would be observed in deciles 8 and 9. The rates would more than double under the Spanish system, except in Venezuela, which would nevertheless experience a large increase from 14 to 24 percent in the top decile. Finally, under the Italian system, AETR would increase more than five times in Ecuador (from 5.4 to 34.8 percent) and Peru (from 5.8 to 33.7 percent), would increase more than eight times in Bolivia (from 3.4 to 30.5 percent) and Colombia (4.4 to 39 percent), and would more than double in Venezuela (from 13.6 to 32.1 percent).

Figure 4 presents average effective tax rates for four socioeconomic categories following de la Cruz, Manzano, and Loterszpil (2020): poor, vulnerable middle class, consolidated middle class, and rich. The categories are defined based on per capita household disposable income and the income thresholds specified by de la Cruz, Manzano, and Loterszpil (2020) included in Table B1 in Appendix B. The results of AETR by socioeconomic status are in line with those by income deciles. For all countries, we find that the impact is more significant among the rich and consolidated middle class under all the scenarios except when the Italian system is simulated, in which case all the socioeconomic categories would experience a noticeable increase in effective tax rates. In Peru an impact on effective tax rates is also observed for the poor when the Uruguayan and Spanish systems are adopted, although it is fairly small. Bolivia would, on the

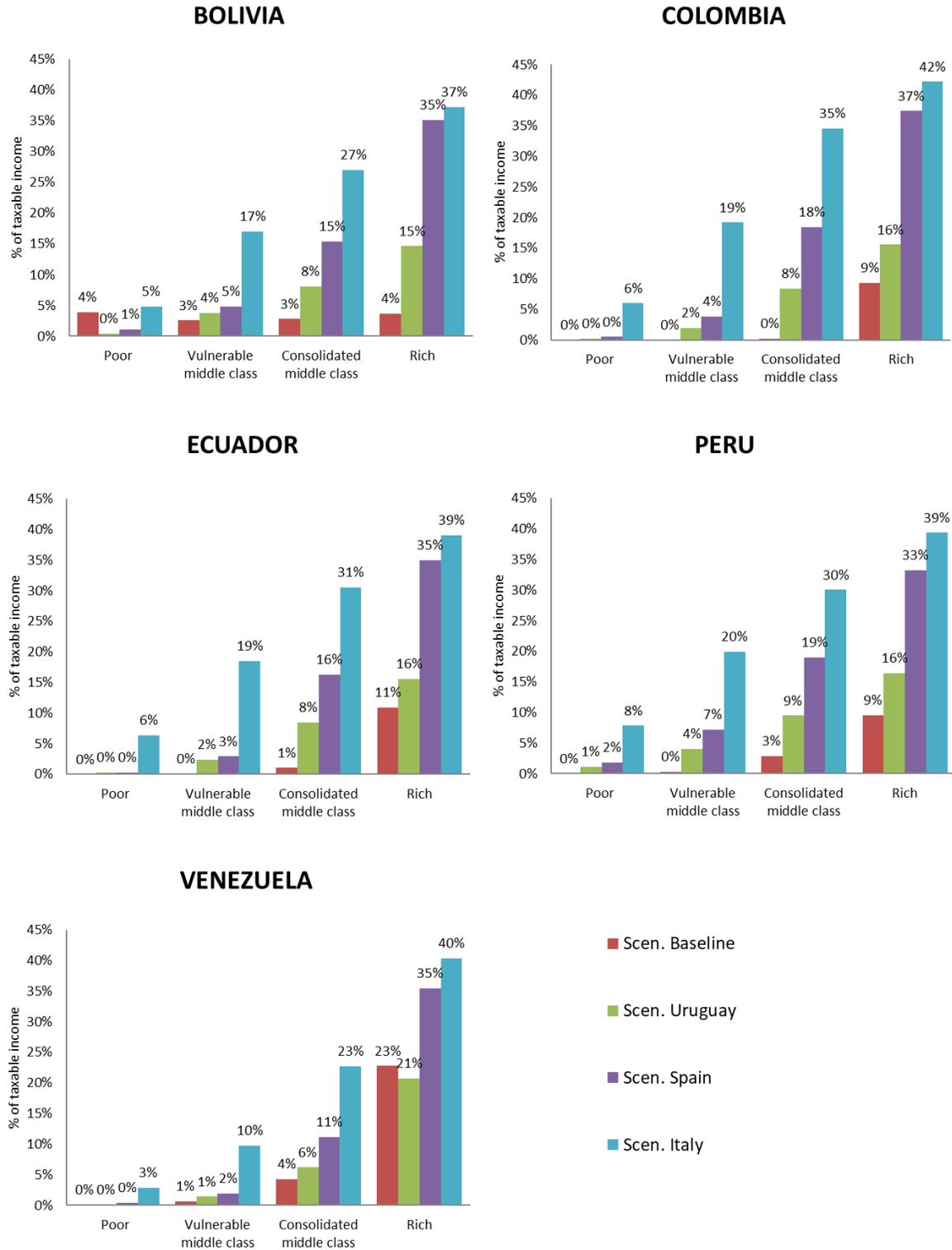
contrary, experience a decrease in the effective tax rate for the poor under the Uruguayan and Spanish scenarios. This is because Bolivia does not have a progressive income tax system, meaning that it taxes the poor in a similar way as the rich. Importantly, the three scenarios affect the vulnerable middle class in all countries, which—even in the case of a fairly small tax burden like those in these scenarios (except in the Italy scenario)—might have adverse effects in terms of work incentives and political feasibility of this type of reforms that should be considered.

Figure 3. Average Effective Tax Rates as Percentage of Taxable Income by Disposable Income Deciles (2015)



Source: Authors' elaboration based on microsimulation models.

Figure 4. Average Effective Tax Rates as Percentage of Taxable Income by Socioeconomic Status (2015)



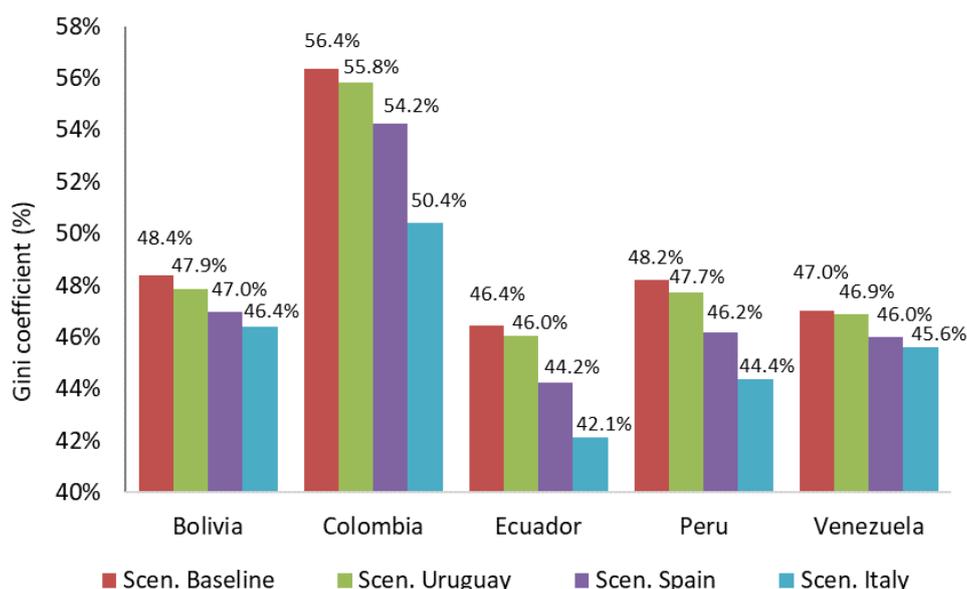
Source: Authors' elaboration based on microsimulation models.

4.3. Distributional Effects

In addition to the budgetary effects of the policy swaps, the scenarios are likely to have important distributional effects. This section assesses the distributional impact of the counterfactual scenarios using the Gini coefficient to measure income inequality.

Figure 5 presents the Gini coefficient from disposable income under the baseline and the three counterfactual scenarios in each country. The results show that income inequality would decrease in all countries under the three scenarios. The redistributive impact of the counterfactual simulations would vary widely across countries, but a common pattern is observed with the Italian system achieving the higher reduction in inequality, followed by the Spanish and Uruguayan income tax systems.

Figure 5. Gini Coefficient under the Baseline and Policy-Swap Scenarios (2015)



Source: Authors' elaboration based on microsimulation models.

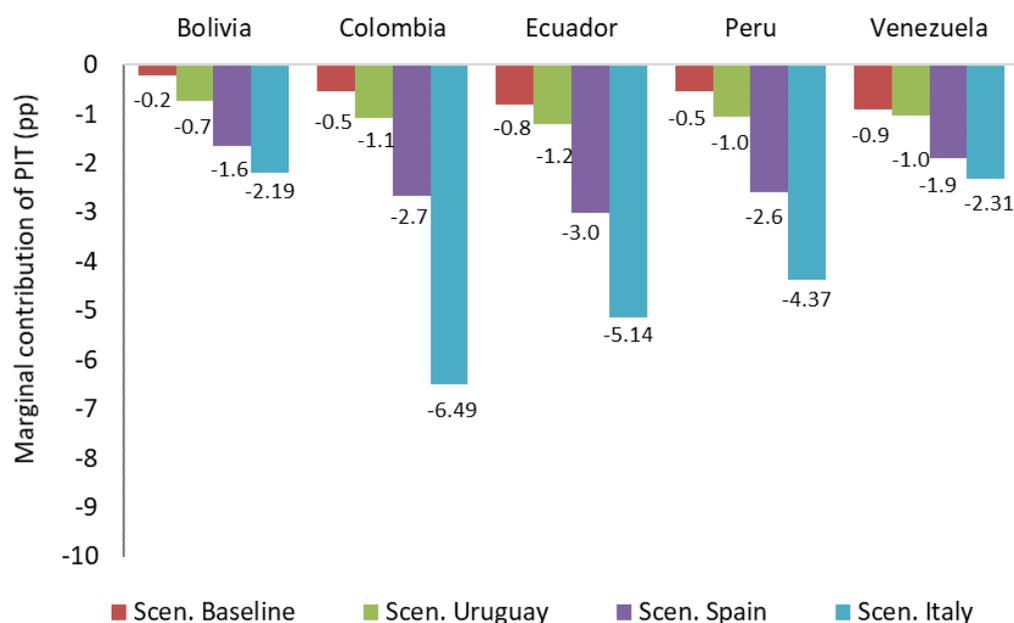
Note: The Gini coefficient is calculated based on the household per capita disposable income.

Under the Uruguayan scenario, the reduction in income inequality would be small in all countries, representing less than a 1 percentage point decrease in the Gini coefficient, given the current similarity of the design of the PIT system. The largest effect would be observed in Colombia (from 56.4 to 55.8 percent), and the smallest in Venezuela (from 47 to 46.9 percent). The effects on inequality are more pronounced under the Spanish scenario. Applying the Spanish tax system would reduce inequality by around 1 percentage point in Bolivia and Venezuela, and by more than 2 percentage points in Colombia, Ecuador, and Peru. The largest reductions of inequality are observed under the Italian counterfactual. In Colombia, the Gini coefficient would drop substantially from 56.4 to 50.4 percent under the adoption of the Italian PIT. The effect is also large in Ecuador and Peru, with a decrease in the Gini coefficient of 4.3 and 3.8 percentage points, respectively. Finally, noticeable effects are also observed in Bolivia, with a fall in the Gini coefficient from 48.4 to 46.4, and in Venezuela with a decrease from 47 to 45.6 percent in the Gini.

The specific effect of PIT on inequality under the baseline and reform scenarios is presented in Figure 6. More precisely, the figure shows the marginal contribution of PIT to inequality reduction, which is calculated as the difference between inequality of disposable income and

inequality before PIT is withdrawn from disposable income. In all countries the inequality-reducing effect of PIT would increase under the counterfactual scenarios, mirroring the pattern observed for the Gini coefficient with the Italian system achieving the largest impact, followed by the Spanish and Uruguayan income tax systems. The largest marginal contribution of PIT is observed in Colombia under the Italian system, where PIT would reduce inequality by 6.5 percentage points compared to a reduction of 0.5 percentage points under the national system. The smallest marginal contribution under the Italian system is observed in Bolivia with a reduction of 2.2 percentage points, which nevertheless represents a substantial increase from the close to nil effect of the national system.

Figure 6. Marginal Contribution of PIT to Inequality Reduction (2015)



Source: Authors' elaboration based on microsimulation models.

Note: The Gini coefficient is calculated based on the household per capita disposable income.

The results highlight the important redistributive impact of applying the Italian and Spanish tax systems in the Andean region, which is linked to a substantial expansion in the fiscal space. However, such scenarios should at best be considered as benchmarks to assess the performance of national systems as they represent a large change in the design of tax policies and would most likely induce a large behavioral reaction (e.g., labor supply response), which is not accounted for in this analysis. Based on these counterfactuals, the next section analyzes the effect of country-specific reforms to the national tax systems in the region with the aim of increasing fiscal capacity.

5. Country-Specific Tax Reforms

The analysis from the previous section reveals the extent to which national PIT systems in the Andean region differ from specific benchmarks. The gaps between national schemes and the benchmarks are driven by three main factors: (i) the level of the exempted threshold, (ii) the progressivity of the tax schedule, and (iii) the generosity of tax deductions. This section focuses on the effect of the latter in limiting fiscal capacity in the region. More precisely, an additional counterfactual scenario is simulated in each country, where certain tax deductions are abolished from the design of PIT. In Colombia, an additional adjustment is performed as

part of the simulation. The Colombian exempted threshold is reduced by half to make it more similar to levels observed in the region (around 2 annualized minimum wages) and the second tax threshold is adjusted to the same proportion of the exempted threshold in the baseline. The reforms implemented in each country under this additional scenario, which we call “limited deductions,” can be summarized as follows:

- **Bolivia:** The effect of keeping the current RC-IVA scheme is simulated, but deducting only 1 minimum wage (rather than 2 minimum wages) from the taxable income, and a 30 percent decrease in the amount of tax credit related to VAT payments that the taxpayer is entitled to.
- **Colombia:** All deductions for personal expenditures are abolished. The exempted tax threshold is fixed at the equivalent of 2 annualized minimum wages and the second tax threshold is set at the equivalent of 3.1 annualized minimum wages.
- **Ecuador:** All deductions for personal expenditures are abolished.
- **Peru:** Deductions for self-employment-related activities are abolished.
- **Venezuela:** All deductions for personal expenditures are abolished.

Tables 6 and 7 present the results of the additional counterfactual scenario in terms of tax revenue and the number of taxpayers. Under the scenario of limited deductions, the results suggest a moderate increase in tax revenue between 12 and 45 percent in all countries, except in Colombia where tax revenue would be more than three times higher than in the baseline (Table 6). The larger increase in Colombia is related to the joint effect of bringing down the exempted threshold and abolishing deductions for personal expenditures from PIT.

In terms of number of taxpayers (Table 7), a larger increase than that of tax revenue is observed. The effect is the largest in Colombia, where the number of taxpayers would increase more than five times. A large increase would also be observed in Bolivia, where the number of taxpayers would more than triple. The increase would be relatively smaller in Ecuador, Peru, and Venezuela, with an increase in the number of taxpayers between 35 and 68 percent.

Table 6. Total Tax Revenue under the Baseline and Reform Scenarios (2015)

	Baseline scenario		Limited deductions scenario	
	Total (millions LCU)	Total (% GDP)	Total (millions LCU)	Total (% GDP)
Bolivia	1,411	0.62	1,670	0.73
Colombia	3,472,547	0.43	12,686,874	1.58
Ecuador	713	0.72	959	0.97
Peru	3,936	0.65	4,389	0.72
Venezuela	64,636	0.80	93,696	1.17

Source: Authors' elaboration based on microsimulation models.

Note: LCU denotes local currency units.

Table 7. Total Number of Taxpayers under the Baseline and Reform Scenarios (2015)

	Baseline scenario		Limited deductions scenario	
	Total (thousands)	Total (% WAP)	Total (thousands)	Total (% WAP)
Bolivia	211	4.15	706	13.91
Colombia	388	2.89	1,992	8.24
Ecuador	349	4.65	544	7.26
Peru	1,624	9.84	2,736	16.58
Venezuela	1,574	11.14	2,129	15.06

Source: Authors' elaboration based on microsimulation models.

Note: WAP denotes working-age population (15+ years).

We now turn to the distributional effects of abolishing tax deductions in Andean countries. Table 8 presents Gini coefficients from disposable income under the baseline and reform scenarios. In all countries except Colombia, the results point to a minor but positive effect in terms of inequality reduction, with a decrease in the Gini coefficient of less than 0.3 percent. In Colombia, abolishing deductions for personal expenditures together with a decrease in the exempted tax threshold would have a pronounced effect on income inequality. In this country, the Gini coefficient would decrease by more than 2 percentage points (from 56.39 to 53.92) under the counterfactual scenario.

Table 8. Gini Coefficient under the Baseline and Reform Scenarios (2015)

	Baseline scenario	Limited deductions scenario	Difference
Bolivia	48.40	48.36	-0.04
Colombia	56.39	53.92	-2.46
Ecuador	46.44	46.22	-0.22
Peru	48.22	48.16	-0.06
Venezuela	47.00	46.86	-0.15

Source: Authors' elaboration based on microsimulation models.

Table 9 presents results on the marginal contribution of PIT to inequality reduction under the baseline and reform scenarios. In all countries except Colombia, one observes a modest increase in the marginal contribution of PIT. In Colombia, the marginal contribution increases from 0.5 to 1.8 percentage points and is due to the combination of eliminating deductions for personal expenditures and lowering the level of the exempted tax threshold.

Table 9. Marginal Contribution of PIT under the Baseline and Reform Scenarios (2015)

	Baseline scenario	Limited deductions scenario
Bolivia	-0.20	-0.24
Colombia	-0.52	-1.76
Ecuador	-0.81	-1.03
Peru	-0.54	-0.60
Venezuela	-0.91	-1.06

Source: Authors' elaboration based on microsimulation models.

Compared to the results of the policy-swap scenarios, the results from the simulations abolishing tax deductions in Andean countries might seem limited. However, they represent more realistic scenarios towards a first set of reforms aimed at increasing fiscal capacity in the region in the short term, and could face less challenges in terms of political feasibility.

6. Conclusions

Low tax revenue in the Andean region represents a major challenge for economic development and for the implementation of sustainable social protection policies. Volatile commodity prices, which countries in this region depend on, put continuous pressure on government budgets. In this context, finding pathways to reform tax systems is paramount in the short- and long-term in the region.

This paper assessed the budgetary and distributional effects of counterfactual reforms to PIT in five Andean countries: Bolivia, Colombia, Ecuador, Peru, and Venezuela. More precisely, harmonized microsimulation models were used based on the information provided in official household surveys to perform two sets of policy reforms. First, the performance of national tax systems with respect to reference benchmarks was assessed by exporting the PIT systems of Uruguay, Spain, and Italy to each of the five Andean countries under study to evaluate their effect on tax revenue and income inequality. Then, to consider more politically feasible scenarios, country-specific reforms were performed to assess the effect of abolishing certain deductions from PIT systems.

The results show that exporting the Uruguayan, Spanish, and Italian PIT systems to the five Andean countries would have a substantial effect in terms of number of taxpayers, tax revenue, and fiscal space, although to different extents in each country. A common pattern is observed across countries, with the Italian system yielding the largest effects on tax revenue and taxpayers, followed by the Spanish and Uruguayan systems. In most countries, tax revenue would double under the Uruguayan system and it would be around 5 times and 10 times higher than the baseline under the Spanish and Italian systems, respectively. A similar pattern applies to the effect of the simulations on income inequality. Under all three counterfactual scenarios, the progressivity of the PIT will improve significantly and the Gini coefficient from disposable income would decrease due to a bigger redistributive effect of the PIT, with the most pronounced effect under the Italian system, followed by the Spanish and Uruguayan. The largest reductions in inequality would be observed in Colombia, particularly under the Italian system, where the Gini coefficient would drop from 56.4 to 50.4 percent.

The benchmarking exercise provides interesting insights into the performance of national tax systems in the Andean region compared to the reference systems. However, such policy-swap scenarios represent significant changes to the design of national schemes which could induce behavioral responses in terms of labor supply—not accounted for in our analysis—and would also prove difficult to implement in the short- and medium-term from a political feasibility perspective. Therefore, our analysis also evaluated the effect of country-specific tax reforms focused on the role of tax deductions. The results show that abolishing deductions from the design of national PIT systems would increase tax revenue by 12 to 45 percent in all countries, except in Colombia, where tax revenue would more than triple. The larger effect in Colombia is the result of not only abolishing deductions for personal expenditures from income tax but also of decreasing the exempted threshold to levels similar to those observed in other countries in the region. This counterfactual scenario would also reduce inequality by 2.5 percentage points in Colombia but would only have a marginal effect in other countries. These positive distributional effects could be reinforced if the proceeds from income tax are used in efficient and well-targeted social spending.

From a policy perspective, the analysis presented here represents only a first step into broader discussions and empirical assessments aimed at redesigning tax-benefit instruments in the Andean region in order to achieve larger fiscal capacity, while at the same time ensuring social protection and the reduction of poverty and inequality. Several extensions could be considered for further analysis. First, this analysis used gross income data as reported in household surveys for the simulations of PIT. However, a number of studies have acknowledged problems related to underreporting and top income undercoverage in survey data. Future research should focus on adjusting top incomes in household survey data in a consistent way across countries to improve the simulation of PIT. Second, assessing the effect of deep changes in the design of taxes requires accounting for potential behavioral reactions. Further efforts should be made to model labor supply responses, taking into account the presence of formal and informal employment in developing countries and generating indicators to assess potential disincentives to work in the formal sector, such as marginal effective tax rates. Finally, our analysis focused on reforms to PIT. However, indirect taxes contribute largely to tax revenue in the Andean region and developing countries in general. A more holistic approach, assessing the effect of reforms to direct and indirect taxes to increase fiscal capacity, should be considered. All these extensions represent promising directions for future research.

References

- Arancibia, C. et al. 2019. Income Redistribution in Latin America: A Microsimulation Approach. WIDER Working Paper 2019/1. Helsinki: UNU-WIDER.
- Atkinson, A. B., F. Bourguignon, and P.-A. Chiappori. 1988. What Do We Learn about Tax Reform from International Comparisons? France and Britain. *European Economic Review* 32(2–3): 343–52.
- Atkinson, A. B., T. Piketty, and E. Saez. 2011. Top Incomes in the Long Run of History. *Journal of Economic Literature* 49: 3–71.
- Bach, S., G. Corneo, and V. Steiner. 2009. From Bottom to Top: The Entire Income Distribution in Germany, 1992–2003. *Review of Income and Wealth* 55: 303–30.
- Bargain, O., H. X. Jara, and D. Rodríguez. 2017. Learning from Your Neighbor: Swapping Tax-Benefit Systems in Latin America. *Journal of Economic Inequality* 15(4): 369–92.
- Bargain, O., H. X. Jara, P. Kwenda, and M. Ntuli. 2019. Learning from the “Best”: The Impact of Tax-Benefit Systems in Africa. WIDER Working Paper 2019/2. Helsinki: UNU-WIDER.
- Burkhauser, R. V., S. Feng, S. P. Jenkins, and J. Larrimore. 2012. Recent Trends in Top Income Shares in the USA: Reconciling Estimates from March CPS and IRS Tax Return Data. *Review of Economics and Statistics* 94: 371–88.
- Burkhauser, R. V., N. Herault, S. P. Jenkins, and R. Wilkins. 2016. What Has Been Happening to UK Income Inequality Since the Mid-1990s? Answers from Reconciled and Combined Household Survey and Tax Return Data. ISER Working Paper no. 2016-03. Colchester, UK: Institute for Social and Economic Research, University of Essex.
- CEPAL-IEF. 2014. Los efectos de la política fiscal sobre la redistribución en América Latina y la Unión Europea. (Estudio no. 8). Serie Estados de la Cuestión. Available at http://sia.eurosocial-ii.eu/files/docs/1412088027-Estudio_8_def_final.pdf.
- Ceriani, L., F. Figari, C. V. Fiorio. 2017. EUROMOD Report Italy 2014–2017. November. Colchester, UK: EUROMOD.
- Decoster, A., J. Pirttilä, H. Sutherland, and G. Wright. 2019. SOUTHMOD: Modelling Tax-benefit Systems in Developing Countries. *International Journal of Microsimulation* 12(1): 1–12.
- de la Cruz, R., O. Manzano, and M. Loterszpil. 2020. Cómo impulsar el crecimiento y fortalecer la clase media en América Latina. IDB-MG-782. Washington, DC: Inter-American Development Bank.
- De Lathouwer, L. 1996. A Case Study of Unemployment Scheme for Belgium and the Netherlands. In A. Harding (ed.), *Microsimulation and Public Policy*. Amsterdam: Elsevier.
- Duryea, S., and M. Robles. 2017. Pulso social de América Latina y el Caribe 2017: ¿Rompemos el molde o repetimos patrones? Washington, DC: Inter-American Development Bank. Available at <https://publications.iadb.org/es/pulso-social-en-america-latina-y-el-caribe-2017-legado-familiar-rompemos-el-molde-o-repetimos>.
- DWP (Department for Work and Pensions). 2015. Households below Average Income: An Analysis of the Income Distribution 1994/95–2013/14. London: Department for Work and Pensions.
- Government of Colombia. 2020. Estatuto Tributario Nacional. Available at <https://estatuto.co/>.
- EUROMOD. 2018. EUROMOD Modelling Conventions. EUROMOD Technical Note EMTN 1.1. Colchester, UK: Institute for Social and Economic Research, University of Essex.
- Hlasny, V. and P. Verme. 2018. Top Incomes and the Measurement of Inequality in Egypt. *The World Bank Economic Review* 32(2): 428–55.

- IMF (International Monetary Fund). 2017. Fiscal Monitor: Tackling Inequality. October. Washington, DC: International Monetary Fund.
- Izquierdo, A., C. Pessino, and G. Vuletin (eds.). 2018. Better Spending for Better Lives: How Latin America and the Caribbean Can Do More with Less. Development in the Americas. Washington, DC: Inter-American Development Bank.
- Jara, H. X., P. C. Lee, L. Montesdeoca, and M. Varela. 2019. UNU-WIDER SOUTHMOD Country Report: Ecuador - ECUAMOD v1.4, 2011–2018. UNU-WIDER SOUTHMOD Country Report Series. Helsinki: UNU-WIDER.
- Jara, H. X. and M. Varela. 2019. Tax-Benefit Microsimulation and Income Redistribution in Ecuador. *International Journal of Microsimulation* 12(1): 52–82.
- Jenkins, S. P. 2017. Pareto Models, Top Incomes and Recent Trends in UK Income Inequality. *Economica* 84: 261–89.
- Levy, H., C. Lietz, and H. Sutherland. 2007. Swapping Policies: Alternative Tax-Benefit Strategies to Support Children in Austria, Spain and the UK. *Journal of Social Policy* 36(4): 625–47.
- Lustig, N. 2018. El impacto del sistema tributario y el gasto social en la distribución del ingreso y la pobreza en América Latina. Una aplicación del marco metodológico del Proyecto Compromiso con la Equidad (CEQ). The CEQ Working Paper Series No. 62. New Orleans: Tulane University Department of Economics.
- OECD, ECLAC, CIAT, and IDB. 2017. Revenue Statistics in Latin America and the Caribbean 2017. Paris: OECD Publishing.
- Oliva, N. 2018. LATINMOD: Un microsimulador regional de políticas fiscales en América Latina. Caracas: CELAG–Bandes.
- Rodríguez, D. 2019. Política fiscal, pobreza y desigualdad: Un modelo de microsimulación para Colombia. *Ensayos de Economía* 29(54): 53–88. <https://dx.doi.org/10.15446/ede.v29n54.76499>.
- Salanauskaite, L. and G. Verbist. 2013. Is the neighbour's grass greener? Comparing family support in Lithuania and four other New Member States. *Journal of European Social Policy* 23(3): 315–31.
- Sutherland, H. and P. Figari. 2013. EUROMOD: The European Union Tax–Benefit Microsimulation Model. *International Journal of Microsimulation* 1(6): 4–26.

Appendix A. PIT Systems in the Countries under Analysis

A1. An Overview of the Bolivian PIT System

Bolivia does not have a direct PIT system. Individuals pay their income tax in a different way depending on the source of income. Consequently, people do not pay income tax on global income. Income from independent business and professional activities is subject to the corporate income tax, whereas income from dependent work is subject to a Complementary Regime to the Value-Added Tax (VAT) where the PIT is regarded as a complement of the payment of the VAT (Régimen Complementario al Impuesto al Valor Agregado, or RC-IVA).

Independent Business and Professional Activities (Self-Employed Workers)

As mentioned, self-employed workers are subject to the corporate income tax (Impuesto sobre las Utilidades de las Empresas, or IUE), which considers as tax base only the profits generated in Bolivia. Profits and losses generated abroad are not taken into account for income tax purposes. There is a difference in how to determine the tax base between business and professional activities.

Individuals with business activities must produce financial statements and keep accounting records and consequently determine their profits like any corporation (i.e., taxable income minus deductible expenses). Taxable income is composed of all income related to the business activity, and deductible expenses are all of those that are used to generate income in the business activity. Some income is considered exempt, such as any income from abroad, dividends, and stock market profits.

For tax purposes, only those expenses necessary for obtaining taxable income or for maintaining and preserving it are deductible. It includes all those of a mandatory nature for legal or contractual reasons (social security contributions and taxes other than income tax). It is important to mention that expenses above 50,000 Bolivianos (BOB) must be justified by reliable means of payment recognized by the Bolivian financial system and regulated by the Supervision Authority of the Financial System (checks, electronic transfer orders, debit and credit cards, among others). Failure to comply with these requirements prevents the deduction of purchases or expenses.

Individuals with professional activities obtain their tax base from a presumed profit which equals 50 percent of the declared gross income. They can also deduct the VAT paid in personal purchases, but this cannot surpass 50 percent of the tax balance.

Since these independent workers, in both business and professional activities, are subject to the corporate income tax, the tax rate that applies is 25 percent to the tax base.

Finally, there is a Simplified Tax Regime (Régimen Tributario Simplificado, or RTS) that Bolivian tax law allows for independent workers to pay their income tax. The RTS is designed to pay a fixed bimonthly tax according to the level of working capital. The RTS is planned to facilitate the payment of taxes for independent workers in the retail sector and artisans. Workers who apply to the RTS must not exceed 69,122 BOB on yearly sales and their capital cannot exceed 37,000 BOB, with the brackets defined as shown in Table A1.

Table A1. RTS Tax Brackets in Bolivia (2015)

Category	Capital from (BOB)	Capital up to (BOB)	Payment (BOB)
1	12,001	15,000	47
2	15,001	18,700	90
3	18,701	23,500	147
4	23,501	29,500	158
5	29,501	37,000	200

Source: Authors' elaboration based on Servicio de Impuestos Nacionales de Bolivia.

PIT for Dependent Workers

As mentioned, Bolivia does not have a direct PIT system. Dependent workers apply a Complementary Regime to the Value-Added Tax (VAT) where the PIT is regarded as a complement of the payment of the VAT (Régimen Complementario al Impuesto al Valor Agregado, or RC-IVA). The tax base of this Complementary Regime is all income related to salaries, real estate rent, capital gains, and all other incomes not covered by the IUE. It is important to mention that dividends are excluded from the tax base and several incomes such as payments on companies' stock or profit shares, seasonal bonuses, subsidies, pensions, and travel expenses do not constitute income subject to RC-IVA.

There are several deductions that apply to the RC-IVA. To obtain the tax base, 2 monthly minimum wages are deducted from the taxable income. The RC-IVA is collected on a monthly basis and has a flat tax rate (constant for all levels of income) of 13 percent (equivalent to the VAT rate). After that, all individuals are allowed to deduct the VAT of 2 monthly minimum wages as a presumed VAT paid and then the taxpayer is allowed to deduct the VAT paid on purchases related to education, sports, culture, and similar services as well as air tickets, ground transportation, rental receipts, school supplies, groceries, and public utilities. The VAT paid deduction cannot exceed the amount of 6 minimum wages and individuals must be registered in the National Tax System (Bolivian Tax Administration).

A.2. An Overview of the Colombian PIT System

In Colombia, PIT is regulated by the Tax Code (Estatuto Tributario). Income is taxed individually, and the tax is levied on income from labor, pension, and properties; since 2017 it has also included income from dividends. Income is converted to Tax Units (Unidades de valor tributario, or UVT) and the tax schedule's bands are established in these units.⁷

Major reforms to the income tax were introduced with Act 1607 of 2012 on Tax Reform, which entered into force in 2013; Act 1739 of 2014, which entered into force in 2015; and Act 1819 of 2016, which entered into force in 2017. For the years 2014–2016 there were three different methods to calculate income tax: the ordinary, IMAN, and IMAS systems. With the third reform in 2016, the system of *cédulas* (Scholar Tax System) was implemented with different rules for different types of income, while all previous systems were eliminated. With this reform, income is divided into: (i) labor income, (ii) pensions, (iii) capital income, (iv) non-labor income, and (v) dividends and participations.

The 2012–2016 PIT

Taxable income was composed of the sum of labor earnings (including bonuses), pension income, and income from properties (except dividends).

Ordinary system. The system allows deducting only mortgage interest payments up to 1,200 UVTs per year, annual expenditure on dependents up to 192 UVTs per year or 10 percent of taxable income (whichever is lower), health payments to contributory health up to 192 UVTs per year, and lastly any contribution to complementary health. From the resulting difference between taxable income after deductions: 25 percent of labor income was considered as vital income and exempt, and pension income up to 12,000 UVTs per year and pension contributions are also exempt. The tax base for income tax calculations was defined as total income minus exemptions, minus deductions. The tax schedule is presented in Table A2.

Table A2. Colombian PIT Schedule, Ordinary System (2012–2016)

Lower limit (UVTs)	Upper limit (UVTs)	Marginal tax rate (%)
0	1,090	0
1,090	1,700	19
1,700	4,100	28
4,100	over	33

Source: Authors' elaboration based on Estatuto Tributario (Government of Colombia, 2020).

IMAN. This system allows deducting only contributory payments to social security (health and pension). The tax schedule is presented in Article 333 of Act 1607 of 2012 and is omitted here for simplicity.

IMAS (employee and self-employed). The system allows deducting contributory payments to social security (health and pension). The tax schedule is presented in Articles 334 (employee) and 340 (self-employed) of Act 1607 of 2012 and is omitted here for simplicity.

The process to determine the amount of income tax payable is as follows. First the ordinary system is compared with the IMAN system, and the higher amount between these two systems is the tax due. Employees with an IMAS tax base below 4,700 UVTs or self-employed workers with an IMAS tax base above 1,400 UVTs and below 27,000 UVTs have the possibility to compare the tax due under the IMAN system with the amount due under the IMAS system and choose which one to pay.

⁷ In 2015, 1 UVT equals COP\$28,279.

A.3. An Overview of the Ecuadorian PIT System

PIT in Ecuador is regulated by the Law of Internal Tax Regime (Ley de Régimen Tributario Interno, or LRTI). Major reforms to this tax were introduced by the Law of Tax Equity (Ley Reformatoria para la Equidad Tributaria) of 2007, which entered into force in 2008 and aimed to increase the progressivity of PIT and to improve tax collection.

PIT in Ecuador is assessed at the individual level. The tax base is defined as taxable income minus exemptions, minus deductions. Since 2008, taxable income is composed of gross earnings from labor (employment and self-employment income), plus extra pay, plus profit sharing. The main sources of income exempted are income from pensions from the Ecuadorian Social Security Institute (IESS), the pay for the 13th and 14th months, reserve funds, and deductions for old age and disability. Deductions from taxable income are composed of contributions to social security and deductions for personal expenditures, which include food, clothing, education, health, and housing. Deductions for personal expenditures cannot be higher than 50 percent of taxable income or 1.3 times the basic exempted band. Additionally, there are individual limits for each type of expenditure. Expenditure in food, housing, education, and clothing cannot exceed 0.325 times the basic exempted band, individually. Expenditure in health cannot exceed 1.3 times the basic exempted band. The tax schedule applied to the tax base covers nine tax bands and rates between 0 and 35 percent, as described in Table A3.

Table A3. Ecuadorian PIT Schedule (2015)

Lower limit (US\$)	Upper limit (US\$)	Marginal tax rate (%)
0	10,800	0
10,800	13,770	5
13,770	17,210	10
17,210	20,670	12
20,670	41,330	15
41,330	61,980	20
61,980	82,660	25
82,660	110,190	30
Over 110,190		35

Source: Authors' elaboration based on Servicio de Rentas Internas.

A.4. An Overview of the Peruvian PIT System

In Peru, the tax system is regulated by Law No. 30532. The Tax System uses Tax Units (Unidad Impositiva Tributaria, or UIT) as the unit to determine the taxation rates. The tributary system is divided into three areas: capital income, business income, and labor income (see Table A4). Our work focuses on income from work, which is divided into income of independent workers (fourth category) and income of dependent workers (fifth category).

Table A4. Classification of Income Tax in Peru

	Category	Income
Capital Income	First category	Lease, sublease, and transfer of assets
	Second category	Other capital income not included in the first category
Business Income	Third category	Commerce, industry, and others expressly considered by the Ley del Impuesto a la Renta (LIR)
Labor Income	Fourth category	Independent work
	Fifth category	Dependent work and other income from independent work expressly indicated by the LIR

Source: Authors' elaboration based on Superintendencia Nacional de Administración Tributaria (SUNAT).

The fourth-category income is related to any profession, trade, or activities not expressly included in the third category, as well as the performance of functions of director of a company, or municipal or regional councilor, for which per diems are received. People must declare their income through receipts for physical or electronic payments and must pay a monthly tax payment of 8 percent on the monthly gross income.

On the other hand, the fifth category of income is compensation for personal work provided in a dependency relationship, including public office, whether elective or not. In addition, it includes annuities and pensions that have their origin in personal work, worker shares, and income from work cooperatives (received by members). Natural or legal persons and public or private entities that pay fifth-category income must withhold monthly, on the remuneration paid to their employees, a portion of the tax they are due to pay on the total taxable income projected for the remaining of the fiscal year. This amount withheld is proportional to the number of months left in the fiscal year, so the retention is calculated every month. In 2015, a progressive tax schedule was established, which is shown in Table A5.

Table A5. PIT Schedule in Peru, Fifth Category (2015)

Lower limit (UIT)	Upper limit (UIT)	Marginal tax rate (%)
0	5	8
5	20	14
20	35	17
35	45	20
45	over	30

Source: Authors' elaboration based on Superintendencia Nacional de Administración Tributaria (SUNAT).

To calculate income tax, the starting point is the gross income of the fourth category. This income is deducted by 20 percent from the total gross income of the fourth category, up to a limit of 24 UIT. After the fourth- and fifth-category income, a fixed amount equivalent to 7 UITs is deducted. The result is the net income from work. It should be noted that taxpayers who receive only fifth-category income may only deduct the fixed amount and that those who obtain income from both categories may deduct the fixed amount once.

Table A6. Calculation of Net Taxable Income in Peru

Gross income		Deductions		Net taxable income
Fourth category	Exercise of a profession, art, science, or other occupation that is done without having a dependency relationship (receipts for fees)	20% of gross income until the limit of 24 UITs	Special deduction of 7 UITs	Net income of fourth and fifth category
	Income received for having worked as a business director, official receiver, representative, executor, or similar activities; income from municipal or regional council per diems	No deduction of 20%		
Fifth category	Workers on payroll	No deduction of 20%		

Source: Authors' elaboration based on Superintendencia Nacional de Administración Tributaria (SUNAT).

A5. An Overview of the Venezuelan PIT System

The tax system in Venezuela uses Tax Units (Unidad Tributaria, or UT) as the unit to account for the determination of national taxes. It is an index that is adjusted annually by authorities. In March 2019 the Venezuelan Tax Administration (SENIAT) changed the value of the UT from 17 bolívares soberanos (Bs) to 50 Bs.

Venezuela has a direct PIT system (Impuesto sobre la Renta, or ISLR). Residents pay income tax on their worldwide income and non-residents on their income generated in Venezuela. Individuals who spend more than 183 days a year in Venezuela are considered residents. Residents are subject to the tax when their gross worldwide income exceeds 1,500 UT, or their net worldwide income exceeds 1,000 UT. There is no distinction between the types of income, so taxpayers must consider as their global income any kind of income (salaries, capital gains, real estate income, etc.) and it is part of the same tax base subject to the PIT regulations. Some incomes are considered exempt from ISLR, such as:

- Dividends that have been previously subject to tax
- Labor compensation in favor of a worker or his/her family
- Retirement fund interests/income in favor of a worker or his/her family
- Retirement or disability pensions
- Donations, inheritances, and legacies
- Contributions to savings institutions and cooperatives
- Interest on fixed-term deposits and mortgage bonds and others authorized by law
- Investment income in collective investment funds

Dependent workers' income includes all income elements from dependent personal services, salaries, and any other remuneration. Travel expenses and any other monetary allocation due to services provided in a different place than the usual home do not constitute income subject to the ISLR. Also, expenses made in the name of the company, within the law regulations, are not considered as taxable income. Dependent workers' income is subject to a monthly withholding which serves as tax credit when the final tax is established.

Income from liberal professionals, sole proprietorship, and any other business activity are included in the global tax base of the individual. The tax base of these workers is the same as any corporation, which is the profit of the economic activity. Liberal professional income is subject to a withholding of 3 percent which serves as tax credit when the final tax is established.

Capital rents such as interest received (different from those explicitly considered exempt from the ISLR), royalties, and real estate are considered taxable income subject to the ISLR and are part of the global tax base. As mentioned, the most important capital rent, dividends, are not considered taxable income. Capital gains, such as stock or share profits, are also subject to the ISLR and must be added to the global tax base. Income from the sale of a residence does not constitute part of the tax base of the ISLR.

Individuals can apply several tax deductions. In addition to those due to the economic activity, Venezuelan tax law allows the following deductions to the tax base:

- Interest paid on loans for the acquisition of the taxpayer's residence, with a limit of 1,000 UT; or the rental costs of this residence, up to 800 UT.
- Education expenses of the taxpayer and his/her dependents (up to 25 years old), paid to resident institutions
- Payments for medical insurance (including maternity), paid to resident institutions

Deductions cannot be applied if they are used as an economic activity deduction or if they are subject to a reimbursement by the employer or any insurance company. Individuals must keep the original invoices to justify the expenses subject to deduction. Taxpayers can apply a unique deduction of 774 UT instead of the three deductions. The ISLR tax rates and income bracket for PIT apply based on the progressive tax schedule shown in Table A7.

Table A7. PIT Schedule in Venezuela (2015)

Lower limit (UT)	Upper limit (UT)	Marginal tax rate (%)
0	1,000	6
1,000	1,500	9
1,500	2,000	12
2,000	2,500	16
2,500	3,000	20
3,000	4,000	24
4,000	6,000	29
	Over 6,000	34

Source: Authors' elaboration based on SENIAT.

A6. An Overview of the Uruguayan PIT System

The Uruguayan tax system is based on the territorial principle, so the income tax only applies to income generated in Uruguay. The so-called indexed unit (Unidad Indexada, or UI) is adjusted daily by the Central Bank, according to the variation of the Consumer Price Index. It is used to set limits on allowances and exemptions, among others. As of January 1, 2015, the UI was equivalent to UYU 2,9634. The so-called benefits and contributions base (Base de Prestaciones y Contribuciones, or BPC) is also an indexed value. It is used to set the tax base and the brackets of the PIT, principally. In 2015, the value of 1 BPC was set at UYU 3,052.

Uruguay has a direct PIT system (Impuesto a la Renta de las Personas Físicas, or IRPF-U⁸). Residents pay the income tax only on their income generated in Uruguay. However, since 2010, some specific types of income from abroad are taxed too. Individuals who spend more than 183 days a year in Uruguay are considered residents. Individuals with their vital economic activities or interests in Uruguay are also considered residents, and it is presumed that a person has their vital interests in the country when their spouse and minor children usually reside in the country or when the income generated in Uruguay is higher than the income generated in another country. Nevertheless, if the individual has their vital interests in Uruguay but they only receive the so-called “pure capital income,” then they are not considered resident.

The IRPF-U has a dual structure based on the type of income, which is classified as follows: Category I (Categoría I), which includes all capital income, and Category II (Categoría II), which includes labor income (dependent workers and also independent economic activities).

Category I: PIT on Capital Income

Category I taxable income includes property income, capital gains, capital rents, dividends, interest, and royalties. The ordinary tax rate of Category I is 12 percent; however, for certain incomes it could be lower. Some capital incomes are considered exempt from the IRPF-U, such as:

- Interest and capital gains on public bonds
- Benefits of participation in so-called horizontally owned civil societies (Sociedades Civiles de Propiedad Horizontal)
- Capital gains derived from the sale of shares or securities when they are issued through a public offering and listed on a stock market
- Income derived from foreign currency fluctuation
- Income from capital operations (each transaction must not exceed 30,000 IU, and the total of all transactions must not exceed 90,000 IU, within the ordinary year)
- Income gained from real estate (must not exceed 40 BPC and other requirements must be met)
- Capital gains from the sale of a home (under certain conditions)

Dividends are taxed at 12 percent when they come from investments abroad and at 7 percent when they come from Uruguayan investments. Royalties and property income are taxed at the ordinary tax rate for Category I. The tax rate for income from interest varies as follows:

- 3 percent on interest paid by financial institutions due to deposits in domestic currency for a term exceeding 10 years
- 3 percent on interest on bonds issued through a public offering and traded on the stock exchange for a term exceeding three years

⁸ To avoid confusion with the Spanish IRPF, we refer to the Uruguayan IRPF as IRPF-U.

- 5 percent on interest paid due to deposits for a term of one year or less
- 12 percent on any other interest

Category II: PIT on Labor Income

Income from dependent workers (salaries and any other remuneration) and from independent economic activities are considered as part of Category II. Pensions and contributions to the social security system are not considered in the tax base. Individuals can apply several deductions, such as:

- Medical expenses related to disabled dependents and minor dependents, up to an amount of 13 BPC for each minor dependent and 26 BPC for each disabled dependent
- Home mortgage payments of the taxpayer
- Individuals with professional activities can deduct 30 percent of their gross income as presumed expenses

The amount of deductions applicable to individuals in Category II is obtained from Table A8.

Table A8. Personal Annual Deductible Amount in Uruguay (2015)

Annual deductible amount (BPC)	Rate (%)
0–36	10
36–96	15
96–516	20
516–816	22
816–1,296	25
over 1,296	30

For spouses who pay the IRPF-U jointly, and their individual income exceeds 12 minimum wages, the rates in Table A9 apply.

Table A9. Spouse Annual Deductible Amount (income above 12 min. wages) in Uruguay (2015)

Annual deductible amount (BPC)	Rate (%)
0–12	15
12–432	20
432–732	22
732–1,212	25
over 1,212	30

For spouses who pay the IRPF-U jointly, and their individual income does not exceed 12 minimum wages, the rates in Table A10 apply.

Table A10. Spouse Annual Deductible Amount (income below 12 min. wages) in Uruguay (2015)

Annual deductible amount (BPC)	Rate (%)
0–48	10
48–84	15
84–504	20
504–804	22
804–1,284	25
over 1,284	30

Taxpayers who are renters of housing can apply a tax credit of 6 percent of the rental price of the house when they are registered at the tax administration and the contract is signed and recognized by authorities.

As mentioned before, the IRPF-U is direct and progressive. The tax schedule for Category II is presented in Table A11.

Table A11. Individual PIT Schedule in Uruguay (2015)

Tax base (BPC)	Marginal tax rate (%)
0–84	0
84–120	10
120–180	15
180–600	20
600–900	22
900–1,380	25
Over 1,380	30

For spouses who pay the IRPF-U jointly, and their individual income exceeds 12 minimum wages, the tax rates in Table A12 apply.

Table A12. Joint PIT Schedule (income above 12 min. wages) in Uruguay (2015)

Tax base (BPC)	Marginal tax rate (%)
0–168	0
168–180	15
180–600	20
600–900	22
900–1,380	25
Over 1,380	30

For spouses who pay the IRPF-U jointly, and their individual income does not exceed 12 minimum wages, the rates in Table A13 apply.

Table A13. Joint PIT Schedule (income below 12 min. wages) in Uruguay (2015)

Tax base (BPC)	Marginal tax rate (%)
0–96	0
96–144	10
144–180	15
180–600	20
600–900	22
900–1,380	25
Over 1,380	30

A7. An Overview of the Spanish PIT System

The Spanish PIT (Impuesto sobre la Renta de las Personas Físicas, or IRPF) is regulated by Law 35/2006, of November 28, 2006, on the PIT and partial amendment of the laws regulating corporation tax, non-resident income tax, and wealth tax. The Spanish PIT is levied on worldwide income of individuals residing in Spain.⁹ The Spanish PIT is assessed at the individual level but individuals belonging to the same family unit can opt to file a joint tax return.¹⁰ In that case, incomes of the family members are pooled together and the family unit is entitled to a new tax allowance in addition to the individual ones.

Under the IRPF gross incomes are classified into two different groups which are taxed based on different schedules. On the one hand, the *general taxable income* is mainly made up of employment income, self-employment income, and some forms of property income, such as income from real estate. On the other hand, the *savings taxable income* comprises the main sources of capital income, particularly income from movable assets (e.g., dividends and interest payments) as well as capital gains on selling property. A number of tax allowances can then be deducted from the general taxable income (see below). If the amount of these allowances is greater than the general taxable income, the exceeding part is deducted from the savings taxable income. The result of this process leads to the *general tax base* and *savings tax base*, to which two different tax schedules will be applied. A number of income sources are exempt from income tax payment. Among them, the main exemptions are pensions from the social security system for disabled individuals, severance payments and unemployment benefits (up to certain limits), maternity benefits (since 2019), and child benefits and child support (the parent who pays the support must pay income tax for it).¹¹

In 2015, the Spanish PIT is characterized by two groups of tax allowances depending on whether their amounts are fully deducted from the tax base or they are deducted from the tax base after first applying the tax schedule to them. The first group includes, mainly, the joint tax allowance, work-related allowance, and contribution to pension schemes allowance. The second group takes into account the personal and family circumstances of the taxpayer. This adequacy is specified in the *personal and family minima* which are designed to quantify the part of the income that, because it is destined to satisfy the personal and family basic needs of the taxpayer, is not taxed by the IRPF. There are four types of tax allowances under this category: personal minimum, minimum by descendants, minimum by ascendants, and minimum for disability of the taxpayer or for disability of descendants or ascendants. The taxpayer must add all the amounts corresponding to their personal and family minima and apply the tax schedule to this amount. The result of this calculation is then deducted from the tax base after the tax schedule has been applied to it.

The tax schedule is set by the state and by each autonomous region. The state sets a common progressive tax schedule and each autonomous region sets its own regional schedule, which is then added to the state tax schedule. Our simulations consider both the state and regional tax schedules, taking as reference the region of Madrid. As such, the Spanish tax schedule considered for the simulations is presented in Table A14.

⁹ For non-residents the PIT is levied on their income gained in Spanish territories.

¹⁰ A family unit is composed of both spouses and their children under 18 who cohabit with them or an unmarried or legally divorced father or mother with cohabiting children under 18.

¹¹ Other exemptions include indemnities for physical or mental damages, court orders or insurance contracts; public benefits due to newborn children, twin newborns, or adoption; grants due to public education, research, and high-level sports; literary, art, scientific, and lottery prizes; capital gains from long-term savings; and wages obtained in a foreign country with a similar PIT to that in Spain up to a limit of 60,100 euros.

Table A14. Spanish PIT Schedule (2015)

Lower limit (euros)	Upper limit (euros)	Total marginal tax rate (a + b) (%)	State marginal tax rate (a) (%)	Autonomous region marginal tax rate (b) (%)
0	12,450.00	19.00	9.50	9.50
12,450.00	17,707.20	23.20	12.00	11.20
17,707.20	20,200.00	25.30	12.00	13.30
20,200.00	33,007.20	28.30	15.00	13.30
33,007.20	34,000.00	32.90	15.00	17.90
34,000.00	53,407.20	36.40	18.50	17.90
53,407.20	60,000.00	39.50	18.50	21.00
	Over 60,000.00	43.50	22.50	21.00

Source: Authors' elaboration based on official legislation of Personal Income Tax (PIT).

Note: The region of Madrid is taken as reference for the regional tax schedule.

Table A15. Spanish Capital Gains Tax Schedule (2015)

Lower limit (euros)	Upper limit (euros)	Total marginal tax rate (a + b) (%)	State marginal tax rate (a) (%)	Autonomous region marginal tax rate (b) (%)
0	6,000	19.00	9.50	9.50
6,000	50,000	21.00	10.50	10.50
	Over 50,000	23.00	11.50	11.50

Once the tax schedule is applied separately to the general tax base and to the savings tax base, the resultant tax liabilities are aggregated and might be decreased by the availability of a number of non-refundable and refundable tax credits. The former—in particular the mortgage tax credit or the main residence tax credit for tenants (although both are on a phasing out status, meaning they will eventually disappear)—cannot decrease the tax liability below 0. Conversely, the latter might be received as a benefit (negative tax) if the amount corresponding to tax credits exceeds the amount corresponding to tax liabilities. These tax credits are: the working-mother tax credit, the tax credit for taxpayers with disabled descendants or ascendants, and the tax credit for large families and single parents.

A8. An Overview of the Italian PIT System

The Italian PIT (Imposta sui redditi delle persone fisiche, or IRPEF) is an individual and progressive tax on total income for residents in Italy and on income produced in Italy for non-resident individuals. The family composition is taken into account by means of tax allowances and tax credits.

The definition of taxable income includes employment and self-employment income, taxable rental income, unemployment benefits, old-age pensions, survivor pensions and invalidity pensions, fringe benefits (exceeding a specific limit), maternity benefits for the self-employed, capital component of private supplementary pensions, and cadastral income from main and other residences.

Types of income exempted from PIT include income subject to withholding taxation (e.g., capital gains and dividends), income subject to separate taxation (e.g., salary arrears, pensions paid out in form of capital, and severance pay), and income free of income tax (e.g., education benefits, certain disability pensions, social allowance for the elderly, family allowances, child benefits, and fringe benefits below a specific limit). Additionally, the main tax allowances include employee and self-employed social security contributions, contribution to private pension plans, the tax deduction for the main residence equal to its cadastral income, and other tax allowances related to disabled persons' health expenses, grants to religious institutions, and expenses for domestic help. The Italian tax schedule applied to the tax base (taxable income deducting tax allowances) is presented in Table A16.

Table A16. Italian PIT Schedule (2015)

Lower limit (euros)	Upper limit (euros)	Marginal tax rate (%)
0	15,000	23
15,000	28,000	37
28,000	55,000	38
55,000	75,000	41
Over 75,000		43

The Italian PIT is also characterized by the presence of tax credits. All tax credits are non-refundable; therefore, the tax liability cannot be negative. Tax credits can be classified into four categories which apply independently: (i) tax credits for personal expenses, (ii) tax credits with economic incentive purposes, (iii) tax credits for income source, and (iv) tax credits for family circumstances.¹²

A regional additional tax also exists and is due on the same tax base of the PIT. The tax rate is made of two components: a mandatory rate and an additional discretionary rate defined by each region within certain limits. The most common regional additional tax rate in 2015 is 1.23 percent on top of the PIT schedule. Finally, Italy has a separate taxation on capital income, which is characterized by varying tax rates between 12.5 and 26 percent depending on the source of income. In terms of rental income (land, housing, and building), the taxpayers have the choice between a withholding tax rate equal to 21 percent or having them as part of the taxable income of the IRPEF.

¹² For further information see Ceriani, Figari, and Fiorio (2017).

Appendix B. Additional Tables

Table B1: Income Thresholds for Socioeconomic Categories in 2015

	Poor	Vulnerable middle class	Consolidated middle class	Rich
Bolivia	<533.3	533.3–1,333.2	1,333.2–6,665.9	>6,665.9
Colombia	<205,329.7	205,329.7–513,324.2	513,324.2–2,566,620.8	>2,566,620.8
Ecuador	<96.0	96.0–240.0	240.0–1,200.0	>1,200.0
Peru	<269.6	269.6–674.0	674.0–3,370.1	>3,370.1
Venezuela	<2,546.2	2,546.2–6,365.6	6,365.6–31,828.0	>31,828.0

Source: Authors' elaboration based on de la Cruz, Manzano, and Loterszpil (2020).

Notes: This classification follows the international lines of the World Bank for extreme poverty and its multiples (1.6, 4, and 20 times, respectively). A household belongs to the vulnerable middle class if it has an income between US\$5 and US\$12.40 per day, and the consolidated middle class corresponds to a range of income between US\$12.40 and US\$62 per day. The definition of the thresholds that separate the vulnerable middle class from the consolidated middle class is based on the concept of economic security. According to Duryea and Robles (2017), the probability of falling back into poverty increases for incomes below US\$12.40 per day, which supports the use of this threshold. The threshold of US\$62 is supported by several studies and exercises that define socioeconomic status based on self-reported information. Figures in local currency units at current prices.