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Tax-benefit microsimulation in Ecuador

A feasibility study

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Abstract: The aim of this study is to evaluate the feasibility to implement a tax and benefit microsimulation model for Ecuador using EUROMOD as an interface. We first present a detailed description of the main components of the tax and benefit system in Ecuador for year 2014. We then describe available micro datasets, which could be potentially used as input data for the microsimulation model. Finally, we provide an assessment and recommendations concerning the possibilities for simulating particular instruments of the tax-benefit system with the data available in the country.

Keywords: taxes, benefits, microsimulation, income
JEL classification: E620, H240

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List of acronyms:

BCE	Central Bank of Ecuador (Banco Central del Ecuador)
CONADES	National Council of Salaries (Consejo Nacional de Salarios)
CCT	Conditional Cash Transfer
CEF	Centre for Fiscal Studies (Centro de Estudios Fiscales)
CPI	Consumer Price Index
HDB	Human Development Bonus (Bono de Desarrollo Humano)
IESS	Ecuadorian Institute of Social Security (Instituto Ecuatoriano de Seguridad Social)
INEC	National Institute of Statistics and Census (Instituto Nacional de Estadística y Censos)
ISD	Tax on International Money Transfers (Impuesto a la Salida de Divisas)
LRTI	Law of Internal Tax Regime (Ley de Régimen Tributario Interno)
PIT	Personal Income Tax
SRI	Internal Revenues Service (Servicio de Rentas Internas)
SICs	Social Insurance Contributions
UBS	Unified Basic Salary

1 Introduction

The aim of the present study is to evaluate the feasibility to implement a tax and benefit microsimulation model for Ecuador using EUROMOD as an interface (Sutherland and Figari 2013). The study presents a detailed description of the main components of the tax and benefit system in Ecuador for year 2014. Historical information about the policies considered is provided, where available.

The study focuses on the tax and social protection system, and data availability issues. In relation to the social protection system, only direct monetary transfer programmes are considered.[1] Additionally, the study suggests potential partner institutions in Ecuador and discusses issues related to the long-term future of the project. More precisely, the study contains a presentation of:

(1) The main taxation policy instruments, with a focus on personal income tax and social insurance contributions (SICs) of employers, employees, and the self-employed.
(2) The main social benefits instruments, both contributory and non-contributory, with a focus on cash benefits provided to individuals.
(3) Issues related to the input data, in particular, a discussion of the different data sets available in Ecuador, which could potentially be used with EUROMOD.
(4) The assessment and recommendations concerning the possibilities for simulating particular instruments of the tax-benefit system.
(5) Potential partners interested in taking part in the project and its long-term future.

During the last decades, there have been numerous important changes to tax and benefit policies in Ecuador and the advantages offered by tax-benefit microsimulation models have been seriously considered by both academics and policy makers. Microsimulation models for personal income tax, corporate profit tax, and indirect taxes have been developed, for instance, by the Centre of Fiscal Studies (Centro de Estudios Fiscales), created in 2008 with the aim of specializing in taxation research. However, an integrated model encompassing both tax and benefit policies for ex-ante evaluation has not been developed so far. The

[1] Other types of social protection intervention include social infrastructure projects, projects of childcare and wellbeing; and education programmes.

development of an integrated tax and benefit model would represent, in this sense, a major step forward for the evaluation of policy reforms on income distribution and welfare.

The choice of EUROMOD as an operating system to develop a microsimulation model for Ecuador presents additional advantages. First, EUROMOD's operating language has been particularly developed for the simulation of tax and benefits policies and, is therefore more user friendly, in the field of ex-ante evaluation, than other statistical programmes are. Second, due to its harmonized language EUROMOD allows an accessible understanding of the policy rules of other countries in the model. Third, given the nature of EUROMOD as a multi-country model, it is straightforward to simulate policy swaps between countries to evaluate the effectiveness of potential policy reforms. Fourth, the EUROMOD interface is regularly updated and partner institutions enjoy the latest developments included in the model. Finally, the EUROMOD project encompasses a network of more than 28 institutions and more than 100 researchers, which leaves an open door for potential collaborations in the field of cross-country policy evaluation.

The remainder of this section provides basic information about the tax and benefit system in Ecuador. Table A1 in the Annex presents information about the main socioeconomic indicators for the period 2003-14.

1.1 Basic information

- Since 2000, Ecuador adopted the USD as national currency.
- In Ecuador, the fiscal year runs from 1 January to 31 December.
- There are national and local taxes in Ecuador. National taxes do not differ across regions and are administered by the Internal Revenues Service (Servicio de Rentas Internas, SRI) (e.g. personal income tax, value-added tax (VAT), etc.). Local taxes are specific to each municipality and are administered by the local authorities (e.g. property tax). All national taxes are regulated by the Law of Internal Tax Regime (Ley de Régimen Tributario Interno, LRTI)[2], while other regulations apply to local taxes. Social security benefits do not differ across regions and are administered by the Ecuadorian Institute of Social Security (Instituto Ecuatoriano de Seguridad Social, IESS) in the case of contributory benefits or specific ministries in case of non-contributory benefits.
- Income is taxed individually in Ecuador (see article 5 of LRTI).[3]
- Different income sources are aggregated for personal income tax calculations, independently of their origin (e.g., capital or labour income).
- Withholdings are made for tax payments. According to the LRTI, in case withholdings exceed tax liabilities individuals can request reimbursement (in the case of personal income tax) or a credit (in the case of VAT).[4] In case withholdings are lower than tax liabilities, taxpayers need to fill in a tax form and pay the difference. Individuals with more than one source of income need to fill in a tax form, independent of whether withholdings match tax liabilities.

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[2] Asamblea Nacional (2014).

[3] Under certain conditions, it is possible to make a joint tax declaration. This is the case if the only source of income for a couple comes from a single and joint business activity (articles 70 and 71 of the regulation for enforcement of the LRTI). In practice, this applies to a very limited number of cases.

[4] In certain cases (e.g., for the elderly or disabled individuals), it is also possible to request reimbursement of VAT.

- For the purpose of income tax and pensions, indexation is considered to take account of inflation. The consumer price index (CPI) of 30 November of each year is used to apply indexation to the following tax year.
- State pension age depends on the number of years of contributions to social security. State pension age is 60 years or more if at least 30 years of contributions have been made. There is no age limit for state pension if the person has contributed 40 or more years (IESS 2015a).
- Minimum legal age for work in Ecuador is 15 years. Dependent children for tax and benefit purposes are those aged less than 18 or those older if they are in full-time education, not receiving earnings, or not affiliated to the IESS. No age limits apply to children with disabilities.
- There are no particular definitions of family groups (such as single mothers) for the purpose of social protection.
- There are no 'authentic' means-tested benefits in Ecuador. The main safety net instrument, the Human Development Bonus (HDB), uses a system of proxy means-testing based on a composite welfare index, known as Selben (see Section 3.2.1).

2 Description of the tax system

National taxes in Ecuador are regulated by the LRTI, introduced in 1989. Since its introduction, the law has been modified several times. The rules described here are those of the LRTI in force in January 2014, with historical references where available. Most tax instruments considered in this report are national taxes, administered by the SRI, and regulated by the LRTI. The only exception is property tax, which is a local tax administered by the municipalities and subject to other regulations. Table A2 in the Annex presents information about revenue from taxes for the period 2003-14.

2.1 Indirect taxes

The main part of tax revenue in Ecuador is generated by indirect taxes. In 2014, indirect taxes represented 54 per cent of total tax revenue (SRI 2015a).

2.1.1 Value-added tax (Impuesto al valor agregado)

The VAT is regulated by the LRTI. Since 2000, the VAT rate has been set at 12 per cent.[5] However, some goods and services considered basic necessities are taxed at a 0 per cent rate, such as food products and basic services like water and electricity. The full list of goods taxed at a 0 per cent rate is specified in articles 54 and 55 of the LRTI.

2.1.2 Excise duties (Impuesto a los consumos especiales)

Excise duties are applied to luxury goods, such as alcohol, tobacco products, automobiles, and other products. The types of goods to which excise duties apply, as well as the specific tax rates for each good have been subject to changes since the introduction of the LRTI in 1989. Article 82 of the LRTI specifies the list of goods to which ICE applies in 2014. The rates vary widely with respect to the type of good, from 5 per cent for motor vehicles (up to

[5] The VAT rate changed from 10 per cent to 12 per cent 1 January 2000 (reform to the LRTI published in the Supplement R.O 321 18 November 1999).

3.5 tons of cargo and sale price less than or equal to USD20,000) to 300 per cent for guns and ammunitions.

2.2 Direct taxes

2.2.1 Personal income tax (Impuesto a la renta de personas naturales)

The PIT in Ecuador is assessed at the individual level and is regulated by the LRTI. Major reforms to the PIT were introduced by the Law of Tax Equity (Ley Reformatoria para la Equidad Tributaria) of 2007 (Asamblea Constituyente 2007), which entered into force in 2008 and aimed to increase progressivity of PIT and to improve tax collection.

Exemptions

Until 2007, the main sources of income exemption of PIT concerned income from pensions from the IESS. One of the reforms introduced in 2008 included as additional exemptions the 13th month pay, 14th month pay, reserve funds, and deductions for disability.[6] The 13th month pay is equal to one-twelfth of earnings from labour received during the calendar year. The 14th month pay is equal to one Unified Basic Salary (UBS), equal to USD340 in 2014 (see Section 3.1). According to the Labour Code, article 196, the reserve fund is equal to one additional salary that is paid to the IESS for each year worked in case the worker is affiliated with the IESS and has decided not to receive such amount as part of his monthly salary directly. Deductions for disability were equal to three times the basic exempted tax band until 2012, and two times since 2013. Deductions for old age are equal to two times the basic exempted band.

Taxable income

Since 2008, taxable income is composed of:[7] earnings from labour (employment and self-employment income) *plus* contributions to social security *plus* extra pay *plus* utilities participation.[8] Before the introduction of the Law of Tax Equity, the 13th month pay, 14th month pay, and the reserve funds were also part of taxable income.

Deductions

Deductions for taxable income are composed of contributions to social security and since 2008, deductions from personal expenditures.[9] Deductions from personal expenditures are equal to expenditure in food, clothing, education, health, and housing. They cannot be higher than 50 per cent of taxable income (sum of monthly earnings from labour, contributions to social security, extra pay, and utilities participation) 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.

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[6] LRTI, article 9, numerals 11, 12, and 15 (Asamblea Constituyente 2007).

[7] LRTI, articles 16 and 17 (Asamblea Constituyente 2007).

[8] Utilities participation is a benefit for employees, where 15 per cent of a firm's utilities are distributed among all employees in the firm.

[9] LRTI, article 10, numerals 9 and 16 (Asamblea Constituyente 2007).

Tax base

The tax base for PIT calculations is defined as taxable income (excluding exemptions) minus deductions.

Tax schedule

The tax schedule applied to the tax base was formed from five tax bands and rates between 5 per cent and 25 per cent until 2007. The tax schedule was modified as part of the reforms introduced in 2008. As a result of the tax reforms, since 2008, the tax schedule is more progressive, with eight tax bands and rates between 5 per cent and 35 per cent. Tables 1 and 2 present the tax schedule for the years 2003-07 and 2008-14, respectively.

Table 1: Personal income tax schedule, 2003-07

Per cent	2003	2004	2006	2007
0	0-6,800	0-7,200	0-7,680	0-7,850
5	6,800-13,600	7,200-14,400	7,680-15,360	7,850-15,700
10	13,600-27,200	14,400-28,800	15,360-30,720	15,700-31,400
15	27,200-40,800	28,800-43,200	30,720-46,080	31,400-47,100
20	40,800-54,400	43,200-57,600	46,080-61,440	47,100-62,800
25	54,400 -	57,600 -	61,440 -	62,800 -

Source: SRI (2015b).

Table 2: Personal income tax schedule, 2008-14

Per cent	2008	2009	2010	2011	2012	2013	2014
0	0-7,850	0-8,570	0-8,910	0-9,210	0-9,720	0-10,180	0-10,410
5	7,850-10,000	8,570-10,910	8,910-11,350	9,210-11,730	9,720-12,380	10,180-12,970	10,410-13,270
10	10,000-12,500	10,910-13,640	11,350-14,190	11,730-14,670	12,380-15,480	12,970-16,220	13,270-16,590
12	12,500-15,000	13,640-16,370	14,190-17,030	14,670-17,610	15,480-18,580	16,220-19,920	16,590-19,470
15	15,000-30,000	16,370-32,740	17,030-34,060	17,610-35,210	18,580-37,160	19,920-38,830	19,470-39,830
20	30,000-45,000	32,740-49,110	34,060-51,080	35,210-52,810	37,160-55,730	38,830-58,390	39,830-59,730
25	45,000-60,000	49,110-65,480	51,080-68,110	52,810-70,420	55,730-74,320	58,390-77,870	59,730-79,660
30	60,000-80,000	65,480-87,300	68,110-90,810	70,420-93,890	74,320-99,080	77,870-103,810	79,660-106,220
35	80,000 -	87,300 -	90,810 -	93,890 -	99,080 -	103,810 -	106,200 -

Source: SRI (2015b).

2.2.2 Corporate profit tax (Impuesto a la renta de personas jurídicas)

Corporate profit tax is regulated by the LRTI (article 37). Until 2011, income from companies was taxed at a flat rate of 25 per cent. Since 2011, the tax rate was progressively decreased by one percentage point per year until reaching 22 per cent, when it would be fixed. In 2014, according to article 37 of the LRTI, income from companies established in Ecuador, as well as branches of foreign companies settled in the country, and permanent establishments of foreign companies without fiscal residence in Ecuador is taxed at a rate of 22 per cent.[10]

A higher tax rate of 25 per cent applies in case companies have actionists, partners, constituents, or beneficiaries, who are residents, are established in tax havens or regimes with a lower imposition, and who have a direct or indirect participation equal to or higher than 50 per cent of the company's capital. When participation is lower than 50 per cent, the rate of 25 per cent will be applied to the proportion of the tax base equivalent to that participation. A 25 per cent tax rate also applies in case the company fails to inform of changes to company shares by its actionists, partners, constituents, or beneficiaries.

2.2.3 Property tax (Impuesto predial)

Property tax is a local tax administered by the municipalities and therefore not regulated by the LRTI but by municipal regulations. Residential property taxes are based on a percentage of the municipal value of the property. Urban and rural properties are taxed at different rates. Homeowners aged 65 and older are subject to exemptions or reduced rates of property tax.

2.2.4 Motor vehicle tax

According to the Law of Tax Reform published in the Supplement R.O. 325 of 14 May 2001, each owner of a motor vehicle is liable to an annual tax on the vehicle owned. The tax base corresponds to a valuation of the vehicle by the SRI. For brand new motor vehicles, the valuation is equal to the highest sell public price informed by the sellers. For other vehicles, the valuation corresponds to the highest selling price minus 20 per cent of annual depreciation but the residual value cannot be lower than 10 per cent of the initial price.

The tax schedule applied to the tax base is presented in Table 3, for years 2001-06 and 2007-14, separately.

Table 3: Motor vehicles tax schedule, 2001-2014

	2001-06		2007-14	
Per cent	from	to	from	to
0.5	0	4000	0	4000
1	4001	8000	4001	8000
2	8001	12000	8001	12000
3	12001	16000	12001	16000
4	16001	-	16001	20000
5			20001	24000
6			24001	-

Source: SRI (2015c).

2.2.5 Tax on international money transfers (Impuesto a la salida de divisas)

In 2008, a tax on International Money Transfers (ISD for its abbreviation in Spanish) from Ecuador was introduced by the Law for Tax Equity 29 December 2007 (article 155) with the aim to control the flow of capital leaving the country (CEF 2013).[11] Initially the tax rate was

[10] A company has fiscal residence in Ecuador if it is created or established in Ecuadorean territory.

[11] There are currently internal discussions about whether to consider this instrument as a direct or indirect tax.

set at 0.5 per cent, it increased to 2 per cent in 2010 and then to 5 per cent in 2012. In 2008, the ISD raised total revenue of around USD31 million. The amount rose to more than USD1,200 million in 2014 (SRI 2015a).

2.2.6 Environment tax (Impuesto ambiental a la contaminación vehicular)

In 2012, an environment tax due to motor vehicle pollution was introduced by the Decree of Law published in the Supplement R.O. 583 24 November 2011. The tax amount depends on the type of vehicle (regular or hybrid) and the cylinder capacity. Exempted from the tax are: vehicles of public institutions, of professional drivers, vehicles destined to transport people with disabilities, classic cars, electric vehicles, ambulances, vehicles of international organisations or diplomatic service, vehicles linked to the economic activity of the owner, and vehicles of senior citizens.

2.3 Social insurance contributions (Aportaciones al IESS)

SICs in Ecuador are defined according to the sector of work of the person affiliated with the IESS. The number of categories related to specific sectors of employment has changed over time.

Since 2009, six categories were defined and pensioners became liable to pay contributions on their pension income (IESS 2009). In 2011, the category referring to self-employed and voluntary affiliated worker was split into two categories. The categories defined since 2011 are the following:

1) private sector employees and secular clergy members;
2) bank employees, employees of municipal and decentralized public institutions, notaries, property and commercial registrars;
3) civil servants, including public education teachers and employees in the judiciary system, or other dependencies providing public services;
4) Foreign Service officers living abroad;
5) temporary workers in the sugar industry;
6) self-employed workers;
7) voluntary affiliates to the IESS.

The following sub-Sections describe SICs for employers, employees, and the self-employed according to the definition of the different categories presented above for the period 2009-14. Additional contributions apply to certain categories.

2.3.1 Employer SICs

All employers are liable to pay SICs on gross employment income. Contributions are not paid in case employment income is lower than the UBS, which is equal to USD340 in 2014.[12] Employers are liable to six types of SICs: pension insurance, health insurance, occupational risk insurance, rural worker insurance (Seguro Campesino), severance pay insurance (Seguro de Cesantía), and administrative costs.

[12] Law of Social Security, articles 11 to 14 (Asamblea Nacional 2015).

As mentioned above, employer social insurance contribution rates are specific to the sector of employment of the worker. Tables 4-7 present the contribution rates for the different sectors of work for the period 2009-14.

For the following categories, contribution rates in Table 4 apply for years 2009-14 (IESS 2009, 2011a, 2011b, 2014b):

- private sector workers and secular clergy members (category A);
- bank employees, employees of municipal and decentralized public institutions, notaries, property, and commercial registrars (category B).

For graphic designers working in printing houses, with additional insurance, either at the private, public, or banking sector on top of the rates described in Table 4, a rate of 6 per cent is paid for additional pension insurance, which adds up to a total rate of 17.15 per cent. For permanent workers in the sugar industry, who first became affiliated since 1 December 2006, an additional rate of 6 per cent is paid on top of the rates described in Table 4.

Table 4: Employer SIC rates for categories A and B (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	3.10	3.10	3.10	3.10	3.10	3.10
Health insurance	5.71	5.71	5.71	5.71	5.71	5.71
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.55
Rural worker insurance	0.35	0.35	0.35	0.35	0.35	0.35
Severance pay insurance	1.00	1.00	1.00	1.00	1.00	1.00
Administration costs	0.44	0.44	0.44	0.44	0.44	0.44
Total	11.15	11.15	11.15	11.15	11.15	11.15

Source: IESS (2009, 2011a, 2011b, 2014b).

For civil servants, including public education teachers, employees in the judiciary system, or other dependencies providing public services (category C), contribution rates in Table 5 apply for years 2009-14. On top of the contribution rates described in Table 5, public education teachers pay an additional pension insurance contribution at a 5 per cent rate, which adds up to a total of 14.15 per cent of SICs.

Table 5: Employer SIC rates for category C (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	1.10	1.10	1.10	1.10	1.10	1.10
Health insurance	5.71	5.71	5.71	5.71	5.71	5.71
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.55
Rural worker insurance	0.35	0.35	0.35	0.35	0.35	0.35
Severance pay insurance	1.00	1.00	1.00	1.00	1.00	1.00
Administration costs	0.44	0.44	0.44	0.44	0.44	0.44
Total	9.15	9.15	9.15	9.15	9.15	9.15

Source: IESS (2009, 2011a, 2011b, 2014b).

For Foreign Service officers living abroad (category D), contribution rates in Table 6 apply for years 2009-14:

Table 6: Employer SIC rates for category D (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	3.10	3.10	3.10	3.10	3.10	3.10
Health insurance	3.71	3.71	3.71	3.71	3.71	3.71
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.55
Rural worker insurance	0.35	0.35	0.35	0.35	0.35	0.35
Severance pay insurance	1.00	1.00	1.00	1.00	1.00	1.00
Administration costs	0.44	0.44	0.44	0.44	0.44	0.44
Total	9.15	9.15	9.15	9.15	9.15	9.15

Source: IESS (2009, 2011a, 2011b, 2014b).

For temporary workers in the sugar industry (category E), contribution rates in Table 7 apply for years 2009-14. Moreover, since 2007, an additional contribution at a rate of 12 per cent applies to this category, which adds up to a total rate of 30.65 per cent and 34.30 per cent in 2014.

Table 7: Employer SIC rates for category E (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	3.87	3.87	6.13	6.13	6.13	6.20
Health insurance	10.42	10.42	9.12	9.12	9.12	11.42
Occupational risk insurance	1.01	1.01	0.55	0.55	0.55	1.10
Rural worker insurance	0.35	0.35	0.35	0.35	0.35	0.70
Severance pay insurance	2.00	2.00	1.5	1.5	1.5	2.00
Administration costs	1.00	1.00	1.00	1.00	1.00	0.88
Total	18.65	18.65	18.65	18.65	18.65	22.30

Source: IESS (2009, 2011a, 2011b, 2014b).

2.3.2 Employee SICs

Employees are liable to pay SICs based on their labour income. The contribution base is defined as gross employment income. Contributions are not paid in the event employment income drops below the UBS.

Until 2005, employees were liable for five types of social contributions: pension insurance, rural worker insurance, severance pay insurance, mortuary co-operative insurance, and administrative costs. In 2005, the mortuary co-operative insurance, which was a contribution to fund funeral aid costs, became part of the pension insurance contributions. In 2014, an additional social insurance contribution for disability was implemented (IESS 2014a).

As in the case of employer SICs, employee SIC rates are specific to the sector of employment of the worker. Tables 8-10 provide the contribution rates for the different categories of workers, for the period 2009-14.

For the following categories of workers, contribution rates in Table 8 apply for years 2009-14:

- private sector employees and secular clergy members (category A);
- Foreign Service officers living abroad (category D).

Graphic designers working in printing houses, with additional insurance, either at the private, public, or banking sector pay on top of the rates described in Table 8, a rate of 2 per cent for additional pension insurance, which adds up to a total rate of 11.35 per cent. Permanent workers in the sugar industry, who first became affiliated 1 December 2006, pay an additional rate of 6 per cent on top of the rates described in Table 8.

Table 8: Employee SIC rates for categories A and D (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	6.64	6.64	6.64	6.64	6.64	6.64
Rural worker social insurance	0.35	0.35	0.35	0.35	0.35	0.35
Severance pay insurance	2.00	2.00	2.00	2.00	2.00	2.00
Disability insurance	-	-	-	-	-	0.10
Administration costs	0.36	0.36	0.36	0.36	0.36	0.36
Total	9.35	9.35	9.35	9.35	9.35	9.45

Source: IESS (2009, 2011a, 2011b, 2014a, 2014b).

For the following categories of workers, contribution rates in Table 9 apply for years 2009-14:

- bank employees and employees of municipal and decentralised public institutions, notaries, property and commercial registrars (category B);
- civil servants, including public education teachers, employees in the judiciary system, or other dependencies providing public services (category C).

On top of the contribution rates described in Table 9, public education teachers pay an additional pension insurance contribution at a 5 per cent rate, which adds up to a total of 16.35 per cent of SICs.

Table 9: Employee SIC rates for categories C and D (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	8.64	8.64	8.64	8.64	8.64	8.64
Rural worker social insurance	0.35	0.35	0.35	0.35	0.35	0.35
Severance pay insurance	2.00	2.00	2.00	2.00	2.00	2.00
Disability insurance	-	-	-	-	-	0.10
Administration costs	0.36	0.36	0.36	0.36	0.36	0.36
Total	11.35	11.35	11.35	11.35	11.35	11.45

Source: IESS (2009, 2011a, 2011b, 2014a, 2014b).

For the temporary workers in the sugar industry (category E), contribution rates in Table 10 apply for years 2009-14. Moreover, since 2007, an additional contribution at a rate of 4 per cent applies to this category, which adds up to a total rate of 21.05 per cent until 2013 and 22.80 per cent in 2014.

Table 10: Employee SIC rates for category E (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	12.34	12.34	12.84	12.84	12.84	13.28
Rural worker social insurance	0.35	0.35	0.35	0.35	0.35	0.35
Severance pay insurance	4.00	4.00	3.50	3.50	3.50	4.00
Disability insurance	-	-	-	-	-	0.10
Administration costs	0.36	0.36	0.36	0.36	0.36	0.72
Total	17.05	17.05	17.05	17.05	17.05	18.80

Source: IESS (2009, 2011a, 2011b, 2014a, 2014b).

Finally, since 2009, pensioners also contribute to social insurance at a rate of 2.76 per cent of their pension income.

2.3.3 Self-employed SICs

Self-employed workers contribute to social insurance based on their gross self-employment income with specific rates. Contributions are not paid in case self-employment income drops below the UBS.

In 2009, a single category regrouping all self-employed groups and individuals voluntarily affiliated to the IESS was defined (IESS 2009). In 2011, the category was split into two separate categories: self-employed workers (category F) and voluntary affiliated workers (category G) (IESS 2011a, 2011b). The contribution rates for these categories are presented in Tables 11 and 12 (IESS 2014b).

Table 11: Self-employed SIC rates for category F (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	9.74	9.74	9.74	9.74	9.74	9.74
Health insurance	5.71	5.71	5.71	6.06	6.06	5.71
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.55
Severance pay insurance	-	-	-	-	-	3.00
Rural worker insurance	0.70	0.70	0.70	0.35	0.35	0.70
Administration costs	0.80	0.80	0.80	0.80	0.80	0.80
Total	17.50	17.50	17.50	17.50	17.50	20.50

Source: IESS (2009, 2011a, 2011b, 2014b).

Table 12: Voluntary affiliates SIC rates for category G (2009-14)

	2009	2010	2011	2012	2013	2014
Pension insurance	9.74	9.74	9.74	9.74	9.74	9.74
Health insurance	5.71	5.71	5.71	6.61	6.61	5.71
Occupational risk insurance	0.55	0.55	0.55	-	-	0.55
Severance pay insurance	-	-	-	-	-	3.00
Rural worker insurance	0.70	0.70	0.70	0.35	0.35	0.70
Administration costs	0.80	0.80	0.80	0.80	0.80	0.80
Total	17.50	17.50	17.50	17.50	17.50	20.50

Source: IESS (2009, 2011a, 2011b, 2014b).

3 Description of the benefit system

This section provides a description of the main instruments of the social protection system in Ecuador. Social protection benefits are classified under two broad categories: contributory and non-contributory benefits. Contributory benefits are social insurance payments made on the basis of previous contributions to the social security system. Non-contributory benefits do not depend on contributions to the social security system but eligibility conditions might apply, in relation to household or individual characteristics. Tables A3 and A4 in the Annex present information about expenditures in contributory and non-contributory benefits for the period 2003-14, respectively. In Ecuador, some benefit amounts (in particular contributory benefits) are expressed in terms of the national minimum wage or UBS. Minimum wages in Ecuador are sector specific; however, a national minimum wage is fixed by the National Council of Salaries (CONADES for its acronym in Spanish) which represents a floor for all sectorial wages. Table 13 shows the amounts of the UBS for years 2003-14.

Table 13: UBS amounts (2003-14)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
UBS	121.91	135.62	150	160	170	200	218	240	264	292	318	340

Source: IESS (2015b).

The sub-Sections below describe in detail the characteristics of contributory and non-contributory social benefits in Ecuador for year 2014, with historical information where available. Only direct monetary social transfers are considered, excluding social security programmes, which provide in-kind benefits.

3.1 Contributory social benefits

3.1.1 Contributory old-age pensions (Jubilación ordinaria por vejez)

Individuals who have contributed to the social security system are entitled to old-age pensions. Entitlement to old-age pensions is assessed with respect to the age of the person and the number of contributions made, as follows (IESS 2015a):

- With no age limit, 480 contributions are required (equivalent to 40 years of work).
- If the person is 60 years old, 360 contributions are required (30 years of work).
- If the person is 65 years old, 180 contributions are requires (15 years of work).
- If the person is 70 years old, 120 contributions are requires (10 years of work).

The pension amount is calculated as follows. First, the monthly average earnings of each year of work are calculated. Then, the average of the top five highest monthly average earnings is calculated. Finally, the result is multiplied by the old-age pension coefficient, which is based on the total years of affiliation to the social security system. Table 14 summarizes the old-age pension coefficients.

In addition to the monthly pensions, the affiliated person receives the 13th month and 14th month pensions. The 13th month pension is paid in December each year and is equal to the average monthly pensions received during the year. The 14th month pension is paid in September each year in the Highlands and Amazonian regions, and in April in the Coast and the region of the Galapagos. The amount is equal to one UBS.

Table 14: Coefficients for old-age pensions

years	coefficient	years	coefficient
5	0.4375	23	0.6625
6	0.4500	24	0.6750
7	0.4625	25	0.6875
8	0.4750	26	0.7000
9	0.4875	27	0.7125
10	0.5000	28	0.7250
11	0.5125	29	0.7375
12	0.5250	30	0.7500
13	0.5375	31	0.7625
14	0.5500	32	0.7750
15	0.5625	33	0.7875
16	0.5750	34	0.8000
17	0.5875	35	0.8125
18	0.6000	36	0.8325
19	0.6125	37	0.8605
20	0.6250	38	0.8970
21	0.6375	39	0.9430
22	0.6500	40	1.0000

Source: IESS (2015a).

Ceilings and floors apply to the old-age pension amounts, which are calculated in terms of the UBS, and depend on the number of years of contributions. Tables 15 and 16 present, for 2010-14, the minimum and maximum pension amounts, respectively.

Table 15: Minimum old-pension amounts (2010-14)

Years of contributions	Per cent of UBS	Minimum old-age pension amounts				
		2010	2011	2012	2013	2014
up to 10	50	120.0	132.0	146.0	159.0	170.0
11-20	60	144.0	158.4	175.2	190.8	204.0
21-30	70	168.0	184.8	204.4	222.6	238.0
31-35	80	192.0	211.2	233.6	254.4	272.0
36-39	90	216.0	237.6	262.8	286.2	306.0
40 or more	100	240.0	264.0	292.0	318.0	340.0

Source: IESS (2015a).

Table 16: Maximum old-pension amounts (2010-14)

Years of contributions	Per cent of UBS	Maximum old-age pension amounts				
		2010	2011	2012	2013	2014
10-14	250	600	660	730	795	850
15-19	300	720	792	876	954	1020
20-24	350	840	924	1022	1113	1190
25-29	400	960	1056	1168	1272	1360
30-34	450	1080	1188	1314	1431	1530
35-39	500	1200	1320	1460	1590	1700
40 or more	550	1320	1452	1606	1749	1870

Source: IESS (2015a).

Concerning the interaction of old-age pensions with the rest of the tax-benefit system, contributory old-age pensions are not subject to income tax but, since 2009, they are subject to SICs.

3.1.2 Contributory invalidity pensions (Jubilación por invalidez)

A person is considered eligible for invalidity pension if they are unable to work due to illness, physical, or mental impairment (IESS 2015c). Invalidity is assessed by means of medical examinations at the IESS.

Contribution conditions for eligibility for absolute and permanent invalidity pension require that:

- The active person has paid a minimum of 60 contributions, of which at least six must have been paid immediately and consecutively before invalidity occurs.
- The unemployed person has paid a minimum of 120 contributions and is not beneficiary of another pension from the IESS. They are eligible if invalidity occurs within the 24 months following the termination of their work.

The amount of invalidity pensions equals 50 per cent of the usual paid received by a worker in similar labour market activity. Ceilings and floors apply to invalidity pension amounts, which are calculated in terms of the UBS, and depend on the number of years of contributions. Tables 17 and 18 present, for years 2010-14, the minimum and maximum invalidity pension amounts, respectively.

Table 17: Minimum invalidity amounts (2010-14)

Years of contributions	Per cent of UBS	Minimum invalidity pension amounts				
		2010	2011	2012	2013	2014
up to 10	50	120.0	132.0	146.0	159.0	170.0
11-20	60	144.0	158.4	175.2	190.8	204.0
21-30	70	168.0	184.8	204.4	222.6	238.0
31-35	80	192.0	211.2	233.6	254.4	272.0
36-39	90	216.0	237.6	262.8	286.2	306.0
40 or more	100	240.0	264.0	292.0	318.0	340.0

Source: IESS (2105c).

Table 18: Maximum invalidity pension amounts (2010-14)

Per cent of UBS	Minimum invalidity pension amounts				
	2010	2011	2012	2013	2014
450	1080	1188	1314	1431	1530

Source: IESS (2015c).

3.1.3 Contributory survivors' pensions (Montepío)

Survivors' pension is a social insurance payment to widows, widowers, orphans, and/or parents of the person to whom the benefit was attributed, that is (IESS 2015d):

- Pensioners who were receiving invalidity or old age pensions before they passed away.
- Individuals with more than 60 contributions (5 years of work) at the moment of death, or who are within the protection period.[13]

The following categories of relatives are entitled to claim survivors' pensions:

- Widows and widowers. In case of cohabitation less than two years, the existence of a child is sufficient for eligibility.
- Children up to 18 years of age or disabled, who had been in charge of the deceased, and who are not married.
- Parents: in case of absence of any widow, widower, or cohabitating partner, mothers and disabled fathers are eligible if they were economically dependent on the deceased.

The monthly amount of survivors' pension is equal to 40 per cent of the pension received by the insured person (IESS 2006); or 60 per cent in case there is only one family member and they are not affiliated or receiving pension (IESS 2010). The pension amount for orphans and parents equals 20 per cent of the pension received by the insured person. Ceilings and floors apply to the survivors' pension amount. The minimum and maximum amounts are set at 50 per cent of the UBS (USD170.00 in 2014) and 450 per cent of the UBS (USD1,513.00 in 2014).

In case the person insured had not completed at least 60 contributions before passing away, the relatives can claim back the payments made to the IESS.

3.1.4 Contributory occupational risk pensions (Seguro de riesgos de trabajo)

The occupational risk pension is a social payment to cover accidents or health problems related to work. In addition to provision of medical assistance, surgery, medicine, hospitalization, and rehabilitation (including provision and maintenance of prosthetics and orthotic devices), direct economic provisions are provided to people affiliated with the IESS 2015b).

[13] A person who has registered 60 monthly contributions and stops contributing to the IESS is still considered affiliated (for survivors pension purposes) for a period equal to one-tenth part of the period of contributions made. This period is known as 'protection period'.

In order to benefit from the occupational risk pension, the employer, the person affiliated with the IESS, or a relative needs to fill in a request within a maximum of ten working days from the date of the accident or health-related problem. The invalidity resulting from an accident or health problem related to work are classified in four categories, depending on the severity of the injuries: (1) temporary invalidity, (2) partial permanent invalidity, (3) total permanent invalidity, and (4) absolute permanent invalidity.

Temporary invalidity benefit

Temporary invalidity refers to accidents or work-related illnesses, which prevent the individual from being able to work. In case of temporary invalidity for a period less than one year, the beneficiary will receive an economic subsidy for the period determined by medical examination. The amount of the subsidy is equal to 75 per cent of the salary during the first ten weeks out of work and 66 per cent during the rest of the time, up to one year. Beyond the first year out of work, if the beneficiary is still unable to work, a provisory benefit equivalent to 80 per cent of the average contribution payment to IESS in the previous year before the accident will be paid. After the first year of payment of the provisional benefit, the provisional payment can be extended for one year, and the beneficiary will attend medical examinations every six months. After two years, a new medical examination will determine whether the person has recovered their capacity to work or whether the condition needs to be consider as partial, total, or absolute permanent invalidity.

Partial permanent invalidity benefit

Partial permanent invalidity refers to injuries, which result in a decrease of the physical integrity of the affiliated person. The amount of the benefit is determined with respect of the severity of the disability.[14] If the severity of partial permanent disability is of at least 20 per cent, a unique global compensation is paid, only once. If the percentage of partially permanent disability is between 21 and 80 per cent, a monthly benefit is paid for life.

Totally permanent invalidity benefit

Totally permanent invalidity refers to injuries, which result in the inability of performing any work activity. The monthly benefit amount is equal to 80 per cent of average earnings in the last contributory year or 80 per cent of the average earnings of the top highest five-year earnings, if the latter amount is higher. This invalidity benefit gives eligibility to survivors' pension.

Absolute permanent invalidity benefit

Absolute permanent invalidity refers to injuries, which result in the inability of performing any organic function without the support of a third person. The monthly benefit amount is equal to 100 per cent of average earnings in the last contributory year or 100 per cent of the average earnings of the top highest five-year earnings, if the latter amount is higher.

[14] IESS (2011b).

3.1.5 *Contributory severance pay insurance benefit (Seguro de cesantía)*

In order to be eligible for severance pay insurance benefit a person must: (1) have at least 24 non-simultaneous contributions to the IESS; (2) have been unemployed at least 60 days; and (3) present a certificate of redundancy to the IESS.

The amount of severance pay insurance benefit is equal to a lump sum payment of three times the average gross employment income over the last twelve months before unemployment.[15]

Unemployed individuals who are in the process of applying for old-age pension or invalidity pension have the right to claim the total amount saved in their individual severance pay insurance fund. In case of death, the total amount saved in the above fund can be claimed by a relative according to the dispositions specified in the law.[16]

3.1.6 *Rural workers' social insurance pensions (Seguro campesino)*

Rural workers' social insurance benefits are aimed at providing protection in the event of disability, old age, illness, or death of workers in the rural area as well as fishermen.

For the purposes of social insurance, a rural worker is a person whose residency is located in the rural area, who works as a fisherman, in the fields as a self-employed worker, or for the community and has not become a permanent employer. Moreover, to be affiliated to the rural workers' social insurance regime the person should not benefit from compulsory social insurance.[17]

Old-age pension

Entitlement to old-age pension under the rural worker's social insurance regime is assessed with respect to the age of the person and the number of contributions made, as follows:

- If the person is aged 65 to 70, 10 years of contributions are required,
- If the person is 71 years old, 9 years of contributions are required,
- If the person is 72 years old, 8 years of contributions are required,
- If the person is 73 years old, 7 years of contributions are required,
- If the person is 74 years old, 6 years of contributions are required,
- If the person is 75 years old, 5 years of contributions are required,

The pension is equal to a monthly amount of 75 per cent of the UBS.

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[15] Law of Social Security (Ley de Seguridad Social), article 277 (Asamblea Nacional 2015).

[16] Law of Social Security (Ley de Seguridad Social), article 285 (Asamblea Nacional 2015).

[17] Law of Social Security (Ley de Seguridad Social), article 9 (Asamblea Nacional 2015).

Invalidity pension

A person is eligible for invalidity pension under the rural worker's social insurance regime if they have registered at least 60 contributions to the fund. The benefit is equal to a monthly amount of 75 per cent the UBS.[18]

3.2 Non-contributory social benefits

3.2.1 Human Development Bonus (Bono de desarrollo humano)

The HDB is a conditional cash transfer (CCT) first introduced in Ecuador in 1998. CCTs have become increasingly popular in the recent decades in Latin America because of their potential to alleviate poverty in the short term, while investing in long-term human capital (Cuesta and Ponce 2007).

The HDB was introduced in 1998, in the midst of an economic crisis, under the name of Solidarity Bonus. The aim of the programme was to make cash transfers to poor households, as a measure to compensate the elimination of gas and electricity subsidies. Three population groups were targeted by the Solidarity Bonus (Dobronsky and Rosero 2007):

- Poor mothers with at least one child under 18, with household earnings below USD40 per month, as long as neither she nor her partner (in case they had one) would receive a regular salary, nor would they be members of the social security system.
- Senior citizens above 65 years old with household earnings below USD40 per month, as long as they do not receive a regular salary.
- Individuals with disability levels of at least 70 per cent, aged between 18 and 65.

The selection to the Solidarity Bonus used a self-targeting strategy, where individuals who considered themselves as potential beneficiaries and fulfilled the conditions of not being members of the IESS and did not receive regular earnings above USD40 would register for the benefit. The initial amount of the Solidarity Bonus was set at USD15.10 per month for beneficiary mothers and USD7.60 per month for each beneficiary senior citizen or disabled person.

In May 2003, the HDB was introduced by combining the Solidarity Bonus with the Education Grant (Beca Escolar) programme.[19] The HDB is reformulated as a CCT with the aim to guarantee a minimum income level, improve human capital formation among poor families, and provide protection to senior citizens and people with disabilities.[20]

In order to (re)target the HDB towards the poor, a system of proxy-means testing was introduced in 2003. A composite welfare index, known as Selben (Sistema de Selección de Beneficiarios), was developed using non-linear principal components analysis based on information on household composition, education levels, dwelling characteristics, and access to services. Annex 2 lists the variables used for the construction of the Selben index. Around

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[18] Law of Social Security (Ley de Seguridad Social), article 134 (Asamblea Nacional 2015).

[19] The programme Beca Escolar had as its aim to provide a cash transfer to poor families with children aged 6 to 15 under the condition that children would be enrolled in school.

[20] Executive Decree 347 (Presidencia de la República 2003).

90 per cent of households in rural areas and selected urban areas with high incidence of poverty are surveyed to construct the Selben index. Eligibility to the HDB is restricted to families in quintiles 1 and 2 of the Selben index.

In 2003, the amount of HDB was USD15 for mothers with children between 6 and 15 in the first two quintiles of Selben, independently of the number or gender of the children; and USD11.5 for senior citizens aged 65 or older, and people with disabilities (level 40 per cent or above), in the first two quintiles of Selben. Two types of conditionality apply for families with children receiving the HDB. First, it is required that children aged 6 to 15 in the household enrol in school and attend at least 90 per cent of the school days in a month. Second, it is required that children under 6 in the household attend health centres at least twice per year for medical check-ups.

From 2003 until now, the HDB has experienced a number of improvements in terms of the calculation of the index to determine eligibility to the programme, the redefinition of the transfer for the elderly as pension assistance, and a series of increases in the benefit amounts (Secretaría Técnica para la Erradicación de la Pobreza 2015). Table 19 presents the amounts of HDB during 2003-14. Additionally, the conditionality of the programme now extends to prenatal health controls, sexual and reproductive health consultations, eradication of child labour and mendacity, maintenance of the dwelling, and an annual update of changes in the socioeconomic situation of the household.

Table 19: HDB, amounts (2003-14)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
poor mothers	15	15	15	15	30	30	35	35	35	35	50	50
senior citizens (age >=65)	11.5	11.5	11.5	11.5	30	30	35	35	35	35	50	50
disabled	11.5	11.5	11.5	11.5	30	30	35	35	35	35	50	50

Source: Presidencia de la República (2003, 2007, 2009, 2013)

3.2.2 Transfer Joaquín Gallegos Lara (Bono Joaquín Gallegos Lara)

In 2010, the Transfer Joaquin Gallegos Lara was introduced with the aim of improving living conditions of people with severe disabilities or illness, who are unable to live independently and who live under critical economic conditions.[21]

The following categories are eligible to the benefit:

- individuals with severe disability (at least 75 per cent level of physical disability or 65 per cent of mental disability);
- individuals with catastrophic or rare illnesses, who are not affiliated with the IESS;
- children under the age of 14 living with HIV/AIDS;
- orphans.

The amount of the benefit is USD240 per month and it is paid to the person responsible for the care of the individual with a disability or illness. In addition to the monetary transfer, medicines, and training for the carer are provided, as well as funerary insurance in case of

[21] Executive Decree 422 (Presidencia del Ecuador 2010).

death of the person with a disability. The carer can moreover have access to a life insurance of USD500.

3.2.3 Housing grant (Bono de la vivienda)

The aim of the grant is to provide financial assistance to families living in Ecuador to help them complete the financing of: (1) their first property purchase; (2) the construction of a property on their owned land; (3) the improvement of their current property.

In order to be eligible for the housing grant an individual must:

- be a permanent resident in Ecuador;
- be older than 18, or if living alone with no dependents, be older than 50;
- not own another home in Ecuador in case of first time buyers and individuals intending to build on their own land; or own only the property that they intend to renew;
- have household income below 2.9 times the UBS;
- intend to purchase or build a property with a maximum value of USD30,000.

The amount of the grant is USD5,000 in rural areas and USD20,000 in urban areas. The cost of the property is financed by three components: (1) private savings, representing 10 per cent of the property price; (2) housing grant; (3) credit from a financial institution qualified by the National Corporation of Public Finances (Corporación Nacional de Finanzas Públicas) or a financial institution, which has an agreement with the Ministry of Urban Development and Housing (MIDUVI).

4 Description of possible data sources

4.1 National Survey on Income and Expenditures of Urban and Rural Households (ENIGHUR 2011-12)

ENIGHUR (ANDA 2012) is a nationally representative cross-sectional survey on income and expenditures of households in Ecuador. The survey is conducted approximately every eight years. The latest ENIGHUR is for years 2011-12 and contains information for 39,617 households. The survey follows a probabilistic two-stage sample design in nine self-represented cities, and a three-stage design in the rest of the country.[22]

The sampling unit is the dwelling defined as the person or group of people living in the same housing structure (dwelling), sharing meals, and who depend on a common budget. Information about the household and each member of the household occupying the dwelling is collected. The survey contains information on personal and household characteristics, labour and non-labour income, taxes and SICs, public and private transfers, and consumption.

Employment and self-employment income refer to gross monthly incomes before taxes. Contributions to social security and taxes are available directly in the data. In-kind income, income from capital, private transfers, income from remittances, and cash transfer

[22] The nine self-represented cities are: Cuenca, Machala, Esmeraldas, Guayaquil, Loja, Manta, Quito, Ambato, and Santo Domingo.

programmes (HDB, Joaquin Gallegos Lara, and housing grant) are also available in the survey. Income from property, other rents, and pensions are also available in the survey. Contributory pensions, however, are not disaggregated.

ENIGHUR seems to be the most suitable survey data to conduct tax-benefit simulations in EUROMOD given that it contains detailed information on different income components and information at the household level. The disadvantage is that the survey is collected only every eight years, which would not allow capturing changes in the labour market between two survey years, unless labour market adjustments are performed on the input data.

4.2 Survey of living conditions (ECV 2013-14)

ECV (INEC 2014) is a nationally representative cross-sectional survey (weighing factors included in the data) on living conditions of households in Ecuador. The survey is conducted approximately every seven years. The ECV follows probabilistic sample design, stratified and proportional to the size of the population. The latest ECV is for years 2013-14 and contains information for 28,970 households.

The sampling unit is the dwelling defined as the person or group of people living in the same housing structure (dwelling), sharing meals and who depend on a common budget. Information about the household and each member of the household occupying the dwelling is collected.

Employment and self-employment income refer to monthly incomes before taxes but net of SICs. Information about registration to the IESS is available so that contributions to social security can be recovered to reconstruct gross monthly earnings. In-kind income, income from capital, private transfers, income from remittances, and cash transfer programmes (HDB and Joaquin Gallegos Lara) are also available in the survey. Income from property, other rents, and pensions are also available in the survey. Contributory pensions are not disaggregated.

The ECV has the advantage of including data on both income and expenditures. The latter is particularly important in order to simulate personal income tax, given that deductions of personal expenditures enter the tax base. As in the case of ENIGHUR, the main disadvantage is the frequency of collection of the data.

4.3 National Survey of Urban and Rural Employment, Unemployment and Underemployment (ENEMDUR)

ENEMDUR (INEC 2015a) is a nationally representative survey (weighing factors included in the data) on employment and income of households in Ecuador. ENEMDUR is conducted quarterly in urban areas and in the fourth quarter, rural areas are also covered. The survey follows a two-stage probabilistic sample design with geographic stratification by domain of study and by rural-urban area. Each urban household is interviewed in four quarters, which allows constructing a short panel of four data periods per household. The survey is designed according to a 2-2-2 scheme, where a sample of household is interviewed during two consecutive quarters, followed by a two-quarter period of rest in which a new sample of households is interviewed, and then the first sample of households is interviewed for two additional quarters before exiting the survey. ENEMDUR 2014 contains information for 30,365 households.

The sampling unit is the dwelling defined as the person or group of people living in the same housing structure (dwelling), sharing meals and who depend of a common budget. Information about the household and each member of the household occupying the dwelling is collected. Employment and self-employment income refer to monthly incomes before taxes but net of SICs. Information about registration with the IESS is available so that contributions to social security can be recovered to reconstruct gross monthly earnings. In-kind income, income from capital, private transfers, income from remittances, and cash transfer programmes (HDB and Joaquin Gallegos Lara) are also available in the questionnaire. Income from property, other rents, and pensions are also available in the survey. Contributory pensions are, however, not disaggregated.

The main advantage of ENEMDUR is that the data is collected quarterly; therefore, the input data for the simulations in EUROMOD could be updated on a more regular basis than with ENIGHUR or ECV. The main disadvantage of ENEMDUR is that it does not contain information on household expenditures, which is necessary to simulate personal income tax. Imputation methods could be used based on information from other sources available.

4.4 Administrative data from the Service of Internal Revenues

Administrative data from tax records of the SRI is available for research purposes with approval from the SRI.[23] The data contains information about approximately three million employed and self-employed workers in 2014. The data is collected annually in the case of income tax records and monthly or every six months in the case of VAT, depending on the sector of activity. The data is recorded as a series of cross sections but it is possible to construct a panel, as individual identifiers from tax forms are available.

The sample unit is the individual, as income is taxed individually. Detailed information about employment and self-employment income, expenditures, and taxes is available. Individual characteristics such as age, gender, marital status, education level, and the number of children (minors and adults) are available. Household characteristics (such as number of people in the household or characteristics of the dwelling) are not available in the records. Labour market characteristics such as hours of work and occupation are not available but sector of work information exists.

Information about social security benefits is not available in the data as those records are held by the IESS. The administrative data captures only the sample of individuals who are working and who appear in the tax records. The unemployed, inactive, and those in the informal economy are in this sense not part of the data. Under certain conditions, records held by the IESS could also be used by the SRI, depending on the terms of the negotiations.

5 Assessment of tax-benefit simulation feasibility

This section assesses the feasibility of simulating the different taxes and benefit instruments reviewed in the previous sections.

The feasibility assessment of each instrument depends in some cases on the dataset we have in mind for the simulation. Table 20 specifies for each policy instrument the feasibility of

[23] Tax record identifiers are modified in order to prevent users from identifying contributors.

simulations. In case the simulation of a policy is feasible (or not) with a specific dataset, this is mentioned explicitly in the table.

Table 20: Feasibility of tax-benefit simulations

I. Income taxation	
I.1. Employers SIC	Yes. Except with administrative data from the SRI.
I.2. Employees SIC	Yes. Except with administrative data from the SRI.
I.3. Self-employed SIC	Yes. Except with administrative data from the SRI.
I.4. Personal income tax	Yes. Except with ENEMDUR, unless imputations of personal expenditures are made.
I.5. Corporate profit tax	No. Except with administrative data from the SRI.
I.6. Property tax	No. (a) Property taxes rules are specific to each municipality (b) Information on property values is not available in the data
I.7. Motor vehicle tax	No. Except with the administrative data from the SRI.
I.8. Environment tax	No. Except with the administrative data from the SRI.
I.9. Tax on international money transfers	No. There is no information on international money transfers.
I.10. Indirect taxes (VAT, excise, etc.)	Yes. Except with ENEMDUR, unless imputations of personal expenditures are made.
II. Social transfers	
II.1. Contributory benefits, incl.: (1) Old-age pension (2) Invalidity pension (3) Survivor's pension (5) Occupational risk pension (6) Unemployment insurance (7) Rural worker pension	No. General reason: Lack of data about the contribution history of the beneficiary, evaluated by the authorities at the moment of application for the benefit.
II.2. Non-contributory benefits, incl.:	
(1) HDB	Yes. Partially based on actual receipt or fully by calculating a pseudo Selben index. Except with administrative data from the SRI.
(2) Joaquin Gallegos Lara	No. Information about disability severity is not available in the data. Except in ECV, where disability severity is available.
(3) Housing Grant	No.

Source: Author's elaboration.

As summarized in Table 20, SICs, personal income tax, and the HDB are possible to simulate (part-simulate in the case of HDB) with all potential datasets, with the exception of administrative data from the SRI. In fact, only national tax policies can be simulated with the use of administrative data, unless the data is merged with records from the IESS; even then, some population groups might not be captured. Contributory benefits, as well as the non-contributory transfer Joaquin Gallegos Lara and the housing grant cannot be simulated because of the lack of information in the data.

Indirect taxes can be simulated except with data from ENEMDUR, which does not contain information on expenditures. Imputing information about expenditures in ENEMDUR could be considered. The main advantage of this dataset with respect to other surveys is the frequency of collection.

6 Potential partners

The development of an integrated tax-benefit model for Ecuador using EUROMOD can be of interest to a great number of public and private institutions for two main reasons. First, the mission and objectives of some governmental institutions are directly linked to the evaluation of policy reforms. Second, as mentioned in the introduction, there have been a number of important policy changes in recent years in Ecuador, which represent potential for research about the effect of those changes on income inequality and work incentives. In what follows, we mention a small number of institutions, which we have identified as being potentially interested in becoming a partner for the development or use of the model.

6.1 Technical Secretariat for the Eradication of Poverty

The Technical Secretariat for the Eradication of Poverty is a governmental body created in 2013. Its mission is to design, co-ordinate, monitor, and evaluate the implementation of the National Strategy for Equality and Eradication of Poverty in a co-ordinated and inter-sectorial manner between different levels of government, generating efficiency and effectiveness.

The specific objectives of designing and evaluating policies aimed to reduce or eradicate poverty go hand-in-hand with the need of appropriate tools for policy reform analysis. Given the specific mission of the Technical Secretariat for the Eradication of Poverty, the institution could be potentially interested in the use of a tax-benefit microsimulation model for ex-ante evaluation of policy reforms aimed to reduce poverty.

6.2 Centre for Fiscal Studies

The Centre for Fiscal Studies (Centro de Estudios Fiscales, CEF) was created in 2008, as part of the SRI (CEF 2008). The Centre has the mission to promote compliance with constitutional principles and to serve the strategic objectives of the SRI through the design and execution of research programmes in fiscal, economic, and social topics aimed at facilitating the specific capacities of public servants and at generating and imparting ethic values and actions among citizens.

The CEF is composed of three departments. The Department of Fiscal Studies has the mission of investigating and generating ideas to guide decision-making in terms of fiscal policy and fiscal administration to contribute to the strategic objectives of the SRI and to comply with constitutional principles. The Department of Fiscal Administration has the mission of improving the quality and coverage of fiscal expertise through the design, development, and execution of programmes and events for public service. The Department of International Trade Studies has the mission of proposing specialized normative and best practices used worldwide in regards to international trade.

The CEF carries out both theoretical and empirical research in the fields of taxation and economics, which are publicly available in their working paper series 'Notas Tributarias' and their review 'Fiscalidad' (CEF 2015a, 2015b).

The CEF has considerable experience in the area of microsimulation. Microsimulation models for personal income tax, corporate profit tax, and indirect taxes, which use administrative data on tax records, have been developed and are continuously used by the institution. In this sense, an integrated model encompassing both tax and benefit policies for ex-ante evaluation using EUROMOD would represent an important tool for future research and policy analysis by the CEF.

6.3 FLACSO-Ecuador

The Latin American Faculty of Social Sciences (Facultad Latinoamericana de Ciencias Sociales, FLACSO) is an academic international organization created in 1957 by governments of Latin America and the Caribbean with the aim to promote research, teaching, and technical co-operation in the field of social sciences. FLACSO has offices, programmes, and projects in 15 countries: Argentina, Brazil, Chile, Costa Rica, Cuba, Ecuador, El Salvador, Spain, Guatemala, Honduras, Mexico, Panama, Paraguay, Uruguay, and Dominican Republic.

The FLACSO institution in Ecuador was established in 1974 and is part of the academic institutions of the university system in Ecuador. The mission of the institution is to build and disseminate knowledge and skills in the field of social sciences and humanities through teaching and, critical and creative research. It is based on the principles of pluralism and academic autonomy in seeking to contribute to the development of the various currents of Latin American and Andean thought, and to promote justice, equity, and social inclusion.

FLACSO is recognized as a leading research institution in Ecuador. One of the research strands of expertise of FLACSO is public affairs, including the study of social policy and inequality. Given their line of research, FLACSO could be a potential partner interested in the use of a tax-benefit microsimulation model for academic research on policy evaluation and inequality.

7 Long-term future

During the last years, there has been increasing interest in the use of microsimulation techniques for ex-ante policy evaluation, mainly of tax reforms, in Ecuador. The main research on tax reform evaluation using microsimulation has been carried out by the CEF. Additionally, the effect of tax and benefit policies on income inequality in Ecuador has attracted the attention of academics (Ponce and Vos 2012; Llerena et al. 2015). However, microsimulation techniques have not been used for such analysis, perhaps due to the lack of an integrated microsimulation model incorporating not only taxes but also social protection benefits.

The development of a tax and benefit microsimulation model for Ecuador could be of interest for both policy makers and academics. Informal discussions with, both, the Technical Secretariat for the Eradication of Poverty and the CEF confirmed their interest in such model, using EUROMOD, and given their experience with microsimulation modelling and their specific missions, they could be interested in taking responsibility for it in the long run. Moreover, if a tax-benefit model using EUROMOD becomes a regular tool used for analysis by one or both of these institutions, funding for updating the model and the input data could be ensured in the long run due to its need. The flexibility of EUROMOD would further allow these institutions to adapt other datasets to run in the model, in order to perform analysis specific to their own projects.

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Annex 1

Table A1: Main country indicators

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Population (thousands)[a]	13,320	13,552	13,721	13,965	14,214	14,473	14,738	15,012	15,266	15,521	15,775	16,027
Exchange rate (USD dollar/euro) [b]	0.8007	0.7337	0.8450	0.7607	0.6795	0.7085	0.6997	0.7528	0.7726	0.7565	0.7238	0.8221
GDP per capita (in USD dollars of 2007) [b]	3,150	3,351	3,484	3,574	3,589	3,748	3,702	3,762	3,991	4,130	4,252	4,345
Average wage (monthly) [b]	158.11	166.14	174.90	186.60	198.26	233.13	254.21	279.85	307.83	340.47	n/a	n/a
Unemployment rate (%)[b]	11.5	8.6	7.9	7.8	6.1	7.3	7.9	6.1	5.1	n/a	n/a	n/a

Notes: n/a: not available.

Source: [a]INEC (2015b), [b]Central Bank of Ecuador (2015).

Table A2: Revenue from taxes, 2003-14 (in millions of USD)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Income tax (incl. PIT and Corporate Profit Tax)	759	908	1,223	1,497	1,757	2,369	2,552	2,428	3,112	3,391	3,933	4,274
Motor vehicle tax	52	57	62	70	74	95	118	156	174	194	214	228
Environment tax	-	-	-	-	-	-	-	-	-	96	115	115
Property tax	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tax on money transfers	-	-	-	-	-	31	188	371	491	1,160	1,225	1,260
Value-added tax	1,759	1,911	2,194	2,476	3,005	3,471	3,431	4,175	4,958	550	6,186	6,670
Internal transactions	1,137	1,167	1,239	1,346	1,518	1,762	2,106	2,506	3,073	3,455	4,096	4,513
Imports	727	866	1,105	1,280	1,486	1,708	1,325	1,668	1,885	2,044	2,090	2,158
Excise duties	278	322	380	417	457	474	448	530	618	685	744	809
Internal transactions	241	274	319	347	381	334	351	392	455	507	569	615
Imports	36	48	60	70	76	140	97	138	162	178	175	194

Notes: n/a: not available.

Source: SRI (2015a).

Table A3: Expenditures contributory benefits, 2003-14 (in millions of USD)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013[a]	2014
Old-age, invalidity and survivor's pensions	n/a	n/a	n/a	836.51	987.86	1172.39	1133.22	1363.31	2212.23	2146.42	2338.16	n/a
Occupational Risk pensions	n/a	n/a	n/a	25.83	30.44	48.41	55.19	73.66	103.65	112.24	123.96	n/a
Rural workers' pensions	n/a	n/a	n/a	39.11	32.09	47.21	75.54	124.99	161.44	176.29	192.40	n/a
Health pensions	n/a	n/a	n/a	280.34	339.79	375.58	530.63	792.08	1284.48	1577.22	604.44	n/a

Notes: n/a: not available.

Source: IESS (2015e).[a] Figures of September 2013.

Table A4: Expenditures in non-contributory benefits, 2003-14 (in millions of USD)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
HDB	159.86	172.72	156.29	179.86	373.16	438.96	525.16	650.2	706.01	731.74	1035.15	864.99
Joaquin Gallegos Lara	-	-	-	-	-	-	-	-	0.0064	0.1371	0.71107	0.398
Housing Grant	n/a	16.28	20.31	12.27	75.79	390.29	173.90	145.41	119.23	167.51	162.31	104.49

Notes: n/a: not available.

Source: Ministry of Finance (2015).

Annex 2

Variables for the construction of Selben index based on Ponce and Arjun (2008).

1. Geographic area
2. Floor material
3. Electricity
4. Shower availability
5. Toilets availability
6. Type of cooking fuel
7. Land availability
8. Persons per bedroom
9. Number of children aged less than six living at home
10. Members of working age without income
11. Head of the home spoken language
12. Head of the home education level
13. Spouse education level
14. Is the head of the home affiliated with any insurance?
15. Has the household some credit?
16. Kitchen or kitchenette availability
17. Colour TV availability
18. Refrigerator availability
19. Telephone availability
20. Car availability
21. Stereo availability
22. VHS availability
23. Children aged between 6-15 years who don't go to school
24. Type of school children attended
25. Number of children that have died
26. Is the last child still alive?
27. Number of disabled persons at home