

SOUTHMOD

Country report

Ecuador

ECUAMOD v1.2

2011-2017

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About the project

[SOUTHMOD – simulating tax and benefit policies for development](#)

SOUTHMOD is a joint project between the United Nations University World Institute for Development Economics Research ([UNU-WIDER](#)), the European Union Tax–Benefit Microsimulation Model ([EUROMOD](#)) team at the Institute for Social and Economic Research ([ISER](#)) at the [University of Essex](#), and Southern African Social Policy Research Insights ([SASPRI](#)) in which tax–benefit microsimulation models for selected developing countries are being built. These models enable researchers and policy analysts to calculate, in a comparable manner, the effects of taxes and benefits on household incomes and work incentives for the population of each country.

SOUTHMOD models are currently available for Ecuador (ECUAMOD), Ethiopia (ETMOD), Ghana (GHAMOD), Mozambique (MOZMOD), Namibia (NAMOD), Vietnam (VNMOD), South Africa (SAMOD), Tanzania (TAZMOD), and Zambia (MicroZAMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents ECUAMOD, the SOUTHMOD model developed for Ecuador. This work was carried out by the [ISER](#) in collaboration with the Instituto de Altos Estudios Nacionales.

The results presented in this report are derived using ECUAMOD version 1.0 running on EUROMOD software. The report describes the different tax–benefit policies in place, how the microsimulation model picks up these different provisions, and the database on which the model runs. It concludes with a validation of ECUAMOD results against external data sources. For further information on access to ECUAMOD and other SOUTHMOD models see the [SOUTHMOD page](#).

The ECUAMOD model and its documentation in this country report has been prepared within the UNU-WIDER project on ‘SOUTHMOD—simulating tax and benefit policies for development’, which is part of a larger research project on ‘The economics and politics of taxation and social protection’. For more information, see the [SOUTHMOD project page](#).

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Acronyms

CPI	Consumer price index
ENEMDU	National Survey of Employment, Underemployment and Unemployment (<i>Encuesta Nacional de Empleo, Desempleo y Subempleo</i>)
ENIGHUR	National Survey of Income and Expenditures of Urban and Rural Households (<i>Encuesta Nacional de Ingresos y Gastos de Hogares Urbanos y Rurales</i>)
HDI	Household disposable income
HDT	Human development transfer (<i>Bono de Desarrollo Humano</i>)
IESS	Ecuadorian Institute of Social Security (<i>Instituto Ecuatoriano de Seguridad Social</i>)
INEC	National Institute of Statistics and Census (<i>Instituto Nacional de Estadística y Censos</i>)
ISD	Tax on international money transfers (<i>Impuesto a la Salida de Divisas</i>)
ISSPOL	Institute of Social Security of the National Police (<i>Instituto de Seguridad Social de la Policía Nacional</i>)
ISSFA	Institute of Social Security of the Armed Forces (<i>Instituto de Seguridad Social de las Fuerzas Armadas</i>)
LRTI	Law of Internal Tax Regime (<i>Ley de Régimen Tributario Interno</i>)
MIES	Ministry of Social and Economic Inclusion (<i>Ministerio de Inclusión Económica y Social</i>)
SRI	Internal revenues service (<i>Servicio de Rentas Internas</i>)
SICs	Social insurance contributions
UBS	Unified basic salary
USD	US dollar
VAT	Value-added tax (<i>Impuesto al valor agregado</i>)

1 Basic Information

1.1 Basic information about the tax–benefit system

Since 2000, Ecuador has adopted the US dollar (USD) as national currency.

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 below 18 years or those older if they are in full-time education, not receiving earnings, or not affiliated to the Ecuadorian Institute of Social Security (*Instituto Ecuatoriano de Seguridad Social*, IESS). No age limits apply to children with disabilities.

For the purpose of human development transfer (HDT, *Bono de Desarrollo Humano*), a family is defined as a couple or single adult with children aged 0–18 years, where children aged 5–18 years must be enrolled and attending education.

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 Revenue Service (*Servicio de Rentas Internas*, SRI) [e.g. personal income tax, value-added tax (VAT, *Impuesto al valor agregado*)]. 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) (Asamblea Nacional 2014), whereas other regulations apply to local taxes. Social security benefits do not differ across regions and are administered by the IESS in the case of contributory benefits or specific ministries in the case of non-contributory benefits.

Income is taxed individually in Ecuador (see Article 5 of the LRTI).¹

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).² 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.

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.

There are no ‘authentic’ means-tested benefits in Ecuador. The main safety net instrument, HDT, uses a system of proxy means-testing based on a composite welfare index known as Selben or index of the Social Registry.

The information and data contained in the ENIGHUR 2011–2012 survey is access free according to the Law of Information and Transparency (2004).

1.2 Social benefits

Benefit 1 [Old-age pensions (*Jubilación ordinaria por vejez*): Entitlement to contributory old-age pensions is assessed with respect to the age of the person and the number of contributions made. For example, there is no age limit if the person has an equivalent of 40 years of contributions (480 contributions), while an equivalent of 10 years of contributions is required for a person aged 70 years. The pension amount is based on previous earnings multiplied by an

1 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 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.

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

old-age pension coefficient. Ceilings and floors apply to the old-age pension amounts, which are calculated in terms of the unified basic salary (UBS), and depend on the number of years of contributions.

Benefit 2 [Invalidity pensions (*Jubilación por invalidez*): A person is considered eligible for invalidity pension if they are unable to work due to illness or physical and/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: (i) 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; (ii) the unemployed person has paid a minimum of 120 contributions and is not a 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 pay 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.

Benefit 3 [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 (IESS 2015d). 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.

Benefit 4 [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). Invalidity resulting from an accident or health problem related to work is classified in four categories, depending on the severity of the injuries: (i) temporary invalidity, (ii) partial permanent invalidity, (iii) total permanent invalidity, and (iv) absolute permanent invalidity. The amount of pension depends on the severity of the injury.

Benefit 5 [Severance pay insurance benefit (*Seguro de cesantía*): To be eligible for severance pay insurance benefit, a person must: (i) have made at least 24 non-simultaneous contributions to the IESS, (ii) have been unemployed at least 60 days, and (iii) 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 12 months before unemployment (Asamblea Nacional 2015: Social Security Law, Article 277). 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 (Asamblea Nacional 2015: Social Security Law, Article 285).

Benefit 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 and 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 (Asamblea Nacional 2015: Social Security Law, Article 9).

Benefit 7 [HDT (*Bono de desarrollo humano*): HDT is a proxy means-tested benefit based on the composite index of socioeconomic classification of the Social Registry. Eligibility to the HDT is restricted to those below the official threshold of the index. Families with children aged 18 years or below, elderly adults, and disabled persons are eligible for the transfer. The benefit amount was USD 35 per month in 2011 and increased to USD 50 in 2015. Two types of conditionality apply for families with children receiving the HDT. First, it is required that children aged 6–18 years 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 below 6 years in the household attend health centres at least twice per year for medical check-ups. The conditionality of the programme also 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.

Benefit 8 [Transfer Joaquín Gallegos Lara (*Bono Joaquín Gallegos Lara*): This benefit aims at improving living conditions of people with severe disabilities or illness, who are unable to live independently and who live under critical economic conditions (Presidencia de la República 2010: Executive Decree 422). The benefit is paid to the person responsible for the care of the individual with the 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 death of the person with the disability.

Benefit 9 [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 either their first property purchase, the construction of a property on their owned land, or the improvement of their current property. Eligible individuals must: (i) be a permanent resident in Ecuador; (ii) be older than 18 years, or, if living alone with no dependents, be older than 50 years; (iii) 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; (iv) have household income below 2.9 times the UBS; (v) intend to purchase or build a property with a maximum value of USD 30,000. The amount of the grant is USD 5,000 in rural areas and USD 20,000 in urban areas.

Benefit 10 [Unemployment insurance benefit (*Seguro de desempleo*): Unemployment insurance is introduced in March 2016, as an insurance for unemployed people who are affiliated to the general social security regime of IESS and who have not found a job after two months of unemployment. Unemployment payments are withdrawn from contributory unemployment insurance fund. The 12-month salary average is paid off in five monthly payments, starting with the first payment that is 70% of the 12 month average, subsequent payments are reduced 5% every month (eg. first month 70%. second month 65%...fifth month 50%).

1.2.1 Not strictly benefits

Not strictly benefit 1 [Free school meals (*Programa de alimentación escolar*): The programme aims at providing free school meals to children aged 3–14 years in order to reduce the gap in access to universal education and to improve its quality and efficiency in public primary school institutions.

Not strictly benefit 2 [Free pre-school and elementary school uniforms and textbooks (*Programa Hilando el Desarrollo y textos escolares gratuitos*): The aim of the programme is to reduce the barriers to access education through the distribution of free uniforms and textbooks for children in public schools.

1.3 Social contributions

Social insurance contribution 1 (to the general regime, *Aportaciones al IESS*): Social insurance contributions (SICs) finance pensions and other contributory benefits (e.g. severance pay). Conditions regarding contributions in the past determine eligibility and amount of contributory benefits. SICs are defined according to the sector of work of the person affiliated with the IESS. SICs cover six types of insurances: pension insurance, health insurance, occupational risk insurance, rural worker insurance, severance pay insurance, and disability insurance (since 2014), as well as administration costs. SICs are assessed on gross incomes above the UBS.

Social insurance contribution 2 (for the armed forces and police, *Aportaciones al ISSFA o ISSPOL*): Members of the armed forces and the national police are affiliated to special regimes of social security with the Institute of Social Security of the Armed Forces (*Instituto de Seguridad Social de las Fuerzas Armadas, ISSFA*) and the Institute of Social Security of the National Police (*Instituto de Seguridad Social de la Policía Nacional, ISSPOL*), respectively. Contribution to these regimes finance contributory benefits such as pension insurance and health.

1.4 Taxes

Tax 1 [Personal income tax (*Impuesto a la renta de personas naturales*): Personal income tax is assessed at the individual level in Ecuador. Taxable income is composed of earnings from labour, SICs, extra pay, capital income, and income from rent. Exemptions apply to the pay for the 13th and 14th months, reserve funds, and deductions for disability and old age. Deductions to taxable income are composed of SICs and deductions from personal expenditures. The tax base is defined as taxable income minus exceptions, minus deductions. The tax schedule is formed of eight bands and rates between 5 and 35 per cent.

Tax 2 [Corporate profit tax (*Impuesto a la renta de personas jurídicas*): Until 2011, income from companies was taxed at a flat rate of 25 per cent. Since 2011, the tax rate was progressively decreased by 1 percentage point per year until it reached 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.³ A higher tax rate of 25 per cent applies in case companies have actionists, partners, constituents, or beneficiaries who are residents, who 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.

Tax 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 years and older are subject to exemptions or reduced rates of property tax.

Tax 4 [Motor vehicle tax (*Impuesto a los vehículos motorizados*): 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.

Tax 5 [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 of 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 and professional drivers, vehicles destined to transport people with disabilities, classic cars, electric vehicles, ambulances, vehicles of international organizations or diplomatic service, vehicles linked to the economic activity of the owner, and vehicles of senior citizens.

Tax 6 [Tax on international money transfers (*Impuesto a la salida de divisas*): In 2008, a tax on international money transfers (*Impuesto a la Salida de Divisas*, ISD) from Ecuador was introduced by the Law for Tax Equity of 29 December 2007 (Article 155) with the aim to control the flow of capital leaving the country (CEF 2013).⁴ Initially, the tax rate was 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 USD 31 million. The amount rose to more than USD 1,200 million in 2014 (SRI 2015a).

Tax 7 (VAT): 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. In 2016, the VAT rate

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

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

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

increased to 14 per cent in all provinces except Manabí and Esmeraldas, which were hit by the earthquake of April 2016.

Tax 8 [Excise duties (*Impuesto a los Consumos Especiales*, ICE)]: Excise duties are applied to luxury goods, such as alcohol, tobacco products, and automobiles. 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 special consumption tax (or ICE) applies in 2014. The rates vary widely with respect to the type of good, from 5 per cent for motor vehicles (up to 3.5 tonnes of cargo and sale price less than or equal to USD 20,000) to 300 per cent for guns and ammunitions.

2 Simulation of taxes and benefits in ECUAMOD

2.1 Scope of simulation

Tables 2.1 and 2.2 present, respectively, the tax and benefit components included in the model. The tables differentiate between those components that are included in the model but not simulated and those that are simulated in ECUAMOD, and provide reasons why simulation was not feasible.

Table 2.1: Simulation of taxes and social contributions in ECUAMOD

	Variable name(s)	Treatment in ECUAMOD (2011–17)	Why not fully simulated?
Personal income tax	<i>tin_s</i>	S	
Property tax	<i>tpr</i>	I	No information on property values in the data
Motor vehicle tax	<i>tca</i>	I	No information on vehicle values in the data
Value added tax (VAT)	<i>tva_s</i>	S	
Special consumption tax (ICE) (excise duties)	<i>tex_s</i>	S	
Employee social insurance contributions (SICs)	<i>tscee_s</i>	S	
Armed forces and police SICs	<i>txcee_s</i>	S	
Self-employed SICs	<i>tscse_s</i>	S	
Employer SICs	<i>tscer_s</i>	S	
Government SICs for armed forces and police	<i>txcer_s</i>	S	

Note: 'S' policy is *simulated* although some minor or very specific rules may not be simulated; 'I' policy is *included* in the microdata but not simulated.

Source: Authors' compilation.

Table 2.2: Simulation of benefits in ECUAMOD

	Variable name(s)	Treatment in ECUAMOD (2011–17)	Why not fully simulated?
Old-age pension	<i>poa</i>	I	No data on contribution records
Invalidity pension	<i>pdi</i>	I	No data on contribution records
Survivors' pension	<i>psu</i>	I	No data on contribution records
Human development transfer (HDT)	<i>bsa</i>	S	
Joaquín Gallegos Lara	<i>bdi</i>	PS	No data on severity of disability in the data
Housing grant	<i>bho</i>	I	No information about the price of the property individuals intend to buy nor about the cost of planned remodelling for their current house

Notes: 'I' policy is *included* in the microdata but not simulated; 'S' policy is *simulated* although some minor or very specific rules may not be simulated; 'PS' policy is *partially simulated* as some of its relevant rules are not simulated.

Source: Authors' compilation.

There have been no structural changes in the tax–benefit system in Ecuador between 2011 and 2013. Parameter changes during these years are explained in detail in the following sections for the tax–benefit instruments simulated in the model. In 2014, the only structural changes concern the introduction of a disability insurance contribution for employees at a rate of 0.1 per cent and the introduction of a severance pay insurance contribution for the self-employed at a rate of 3 per cent.

Structural changes

In March 2016, the unemployment insurance benefit was implemented/introduced. In order to be eligible for unemployment insurance, the person must have contributed to the social security system over 24 months, the benefit amount is based on the average earnings of the last 12 months in work, and decreases over time. The maximum duration is 5 months. In 2017, Jjune 1, the VAT rate was reduced from 14% to 12% in all provinces.

2.2 Order of simulation and interdependencies

Table 2.3 shows the order in which the policies in ECUAMOD are simulated. The order is the same for all years.

Table 2.3: ECUAMOD spine: Order of simulation

Policy	EC_2011	EC_2012	EC_2013	EC_2014	EC_2015	EC_2016	EC_2016	Description of the instrument and main output
Uprate_ec	On	On	On	On	On	On	On	DEF: UPRATING FACTORS
ConstDef_ec	On	On	On	On	On	On	On	DEF: CONSTANTS
llsdef_ec	On	On	On	On	On	On	On	DEF: STANDARD INCOME CONCEPTS
lldef_ec	On	On	On	On	On	On	On	DEF: INCOME CONCEPTS
TUDef_ec	On	On	On	On	On	On	On	DEF: ASSESSMENT UNITS
yem_ec	Off	Off	Off	Off	Off	Off	Off	DEF: Minimum Wage
neg_ec	On	On	On	On	On	On	On	DEF: recode negative self-employment income to zero
tscee_ec	On	On	On	On	On	On	On	SIC: Employee Social Insurance Contributions (Aportaciones personales IESS asalariados)
txcee_ec	On	On	On	On	On	On	On	SIC: Armed Forces and Police Social Insurance Contributions (Aportaciones personales ISSFA o ISSPOL)
tscse_ec	On	On	On	On	On	On	On	SIC: Self-employed Social Insurance Contributions
tscer_ec	On	On	On	On	On	On	On	SIC: Employers Social Insurance contributions (Aportaciones patronales IESS)
txcer_ec	On	On	On	On	On	On	On	SIC: Government Social Insurance Contributions for armed forces and police (Aportaciones patronales ISSFA/ISSPOL)
tin_ec	On	On	On	On	On	On	On	TAX: Personal Income Tax (Impuesto a la renta de personas naturales)
bsa_ec	On	On	On	On	On	On	On	BEN: Human Development Transfer (Bono de Desarrollo Humano)
bcrdi_ec	On	On	On	On	On	On	On	BEN: Disability carer benefit (Bono Joaquín Gallegos Lara)
tva_ec	On	On	On	On	On	On	On	TAX: Value Added Tax (IVA)
tex_ec	On	On	On	On	On	On	On	TAX: Special Consumption Tax – Excise and ad valorem (Impuesto a los Consumos Speciales)
output_std_ec	On	On	On	On	On	On	On	DEF: STANDARD OUTPUT INDIVIDUAL LEVEL
output_std_hh_ec	Off	Off	Off	Off	Off	Off	Off	DEF: STANDARD OUTPUT HOUSEHOLD LEVEL

Notes: DEF, definitional policy; SIC, social insurance contribution policy; BEN, benefit policy.

Source: Authors' compilation.

Minimum wage is simulated first, as the simulation of this policy affects employment income that is subsequently an input to SICs, personal income tax, and means-tested benefits. National minimum wage is also known as UBS (defined earlier) and it represents the basis for the calculation of floors and ceilings of contributory pensions and benefits. The UBS was fixed at USD 264 in 2011, USD 292 in 2012, USD 318 in 2013, USD 340 in 2014, USD 354 in 2015, and USD 366 in 2016 and by 2017 it was increased to USD375. Note, however, that minimum wage is turned off in all years.

SICs are simulated first as they are deducted from taxable income in the simulation of personal income tax. HDT and the disability carer benefit are not taxable and are therefore simulated after income tax. VAT is simulated at the end.

2.3 Social benefits

2.3.1 Human Development Transfer (bsa_s)

Definitions

The objective of HDT is to improve human capital and avoid the persistency of poverty by means of direct monetary transfers to poor families aiming at: (i) guaranteeing a minimum level of income to families, (ii) introducing co-responsibilities oriented to investment in health and education, and (iii) protecting elderly adults and people with disabilities.

Eligibility conditions

Three population subgroups are eligible for HDT:

- families with children younger than 18 years,
- elderly adults who do not receive any pension, and
- disabled persons.

Income test

HDT is a proxy means-test benefit. The proxy means test is based on the composite index of socioeconomic classification of the Social Registry. The index is based on a series of variables containing information on household characteristics, characteristics of the head of the household, housing, living conditions, assets, and territory (Fabara 2009).

In order to be eligible for HDT, families (a couple or single adult with children aged 0–18 years, where children aged 5–18 years must be enrolled and attending education) of children aged 18 years or below need to belong to the poorest population according to the composite index; that is, they need to fall below the poverty line established by the Ministry of Social Development Coordination (*Ministerio de Coordinación de Desarrollo Social*). Elderly adults and disabled persons (with 40 per cent or higher degree of disability) need to be in vulnerability conditions (as defined by the Ministry of Social Development Coordination) and cannot be affiliated with any type of social security institutions.

Conditionality

Two types of conditionality apply for mothers with children receiving HDT. First, it is required that children aged 6–18 years 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 below 6 years in the household attend health centres at least twice per year for medical check-ups. Additionally, the conditionality of the programme 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.

Benefit amount

In 2011, the benefit amount for HDT was USD 35 per month. Since 2013, the amount has been fixed at USD 50 per month (Presidencia de la República 2009, 2013).

ECUAMOD notes

In order to simulate eligibility for HDT, a pseudo composite index was generated in the input data. Our pseudo index and the official index are likely to have different distributions as they are based on different samples. Therefore, we determine the threshold for eligibility as the value of the pseudo index below which we identify the same number of individuals as the official index. In 2014, the official threshold was revised for families with children. The new threshold for our pseudo index is determined in the same way, that is, the value below which we identify the same number of individuals as with the official threshold.

2.3.2 Transfer Joaquín Gallegos Lara (bcrdi_s)

Definitions

In 2010, the transfer Joaquín 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 (Presidencia de la República 2010: Executive Decree 422).

Eligibility conditions

The following categories are eligible for 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 or receiving pensions from the IESS, ISSFA, or ISSPOL;
- children below the age of 14 years living with HIV/AIDS; and
- orphans.

Income test

There is no income test.

Benefit amount

The amount of the benefit is USD 240 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 death of the person with a disability. Also, the carer can have access to a life insurance of USD 500.

ECUAMOD notes

The transfer Joaquín Gallegos Lara is only part simulated in ECUAMOD, meaning that eligibility to the benefit is based on whether individuals are observed receiving the benefit in the data. Full simulation (simulation of eligibility) is not possible because information about the degree of disability is not available in the data.

2.3.3 Unemployment insurance benefit (not simulated in the model)

Eligibility criteria

In order to receive unemployment benefits, an individual has to be unemployed for at least 60 days; have contributed to the general social security system through an employer for at least 24 cumulative and non-simultaneous contributions in relation to dependence, of which 6 contributions need to have been made consecutively before unemployment and immediately prior to the contingency; not be retired; and not to have voluntarily quit a job.

Amount of the payment

Unemployment benefits are based on two criteria, the average of the past 12 months' salary and the total amount that the employee has accumulated in her entire unemployment fund. Unemployment payments are withdrawn from this fund. The 12-month salary average is paid off in five monthly payments, starting with the first payment that is 70% of the 12 month average, subsequent payments are reduced 5% every month (eg. first month 70%, second month 65%, fifth month 50%). At the end of the 5 months unemployment period, the employee can decide to withdraw the entirety of the remaining employment fund.

Duration of the benefit

The duration of payment is 5 months, starting from the 4th month of unemployment.

ECUAMOD notes

The unemployment insurance benefit is currently not simulated in the model because information on previous work history is not available in the data to simulate eligibility and

benefit amounts. Part-simulation is not possible due to the fact that the benefit was introduced in 2017 and the input data for ECUAMOD is from 2011–2012 so recipients cannot be identified.⁶

2.4 Social contributions

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. The following categories have been defined since 2011:

- Category A: private sector employees and secular clergy members
- Category B: bank employees, employees of municipal and decentralized public institutions, notaries, and property and commercial registrars
- Category C: civil servants, including public education teachers and employees in the judiciary system, or other dependencies providing public services
- Category D: foreign service officers living abroad
- Category E: temporary workers in the sugar industry
- Category F: self-employed workers
- Category G: voluntary affiliates to the IESS.

The following sub-sections describe SICs for employees, employers, and the self-employed according to the definition of the different categories presented above for the period 2011–16. In particular, we are able to distinguish between five of the categories for the simulations in ECUAMOD: A, B, C, F, and G. The categories that cannot be distinguished in the data represent only a small proportion of the workforce and are assumed to pay social contributions in line with the rules for the main category (A).

2.4.1 Employee social contributions (tscee_s)

Liability to contributions

All employees are liable to pay SICs based on their labour income.

Income base used to calculate contributions

The contribution base is defined as gross employment income. Contributions are not paid in the event employment income drops below the UBS.

Contribution rates

In 2011, employees were liable to four types of social contributions: pension insurance, rural worker insurance, severance pay insurance, and administrative costs. Since 2014, an additional SIC for disability was implemented (IESS 2014a). In 2016 contributions to health insurance were introduced but they were abolished in 2017.

Contribution rates in Table 2.4 apply to workers under category A for years 2011–16.

Table 2.4: Employee SIC rates for category A (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	6.64	6.64	6.64	6.64	6.64	5.76	6.64
Rural worker social insurance	0.35	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	2.00
Disability insurance	—	—	—	0.10	0.10	0.10	0.10
Health insurance	—	—	—	—	—	0.88	--
Administration costs	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Total	9.35	9.35	9.35	9.45	9.45	9.45	9.45

Source: IESS (2011a, 2011b, 2014a, 2014b, 2015f, 2016b).

⁶ The minimum severance pay guarantees at least three months.

Workers under categories B and C are subject to contribution rates for years 2011–16 as shown in Table 2.5 for years 2011–17. In 2016 contributions to health insurance were introduced but they were abolished in 2017.

Table 2.5: Employee SIC rates for category B (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	8.64	8.64	8.64	8.64	8.64	7.76	8.64
Rural worker social insurance	0.35	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	2.00
Disability insurance	—	—	—	0.10	0.10	0.10	0.10
Health insurance	—	—	—	—	—	0.88	--
Administration costs	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Total	11.35	11.35	11.35	11.45	11.45	11.45	11.45

Source: IESS (2011a, 2011b, 2014a, 2014b, 2015f, 2016b).

Workers under category C are subject to contribution rates as shown in Table 2.6 for the years 2011–17. In 2016 contributions to health insurance were introduced and retained for this category.

Table 2.6: Employee SIC rates for category C (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	8.64	8.64	8.64	8.64	8.64	5.76	6.64
Rural worker social insurance	0.35	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	2.00
Disability insurance	—	—	—	0.10	0.10	0.10	0.10
Health insurance	—	—	—	—	—	2.88	2.00
Administration costs	0.36	0.36	0.36	0.36	0.36	0.36	0.36
Total	11.35	11.35	11.35	11.45	11.45	11.45	11.45

Source: IESS (2011a, 2011b, 2014a, 2014b, 2015f, 2016b).

ECUAMOD notes

Employee SICs of worker categories A–C are simulated in ECUAMOD according to the information available in the data. The categories that cannot be distinguished in the data represent only a small proportion of the workforce and are assumed to pay social contributions in line with the rules for the main category (A).

2.4.2 Employer social contributions (tscer_s)

Liability to contributions

All employers are liable to pay SICs on gross employment income.

Income base used to calculate contributions

The contribution base is defined as gross employment income. Contributions are not paid in the event that employment income is lower than the UBS.

Contribution rates

Employers are liable to six types of SICs: pension insurance, health insurance, occupational risk insurance, rural worker insurance, severance pay insurance, and administrative costs.

For workers under categories A and B, contribution rates in Table 2.7 apply.

Table 2.7: Employer SIC rates for categories A and B (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	3.10	3.10	3.10	3.10	3.10	0.10	0.16
Health insurance	5.71	5.71	5.71	5.71	5.71	9.06	9.00
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.20	0.20
Rural worker insurance	0.35	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	1.00
Administration costs	0.44	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	11.15

Source: IESS (2011a, 2011b, 2014b, 2015f).

For category C, contribution rates in Table 2.8 apply.

Table 2.8: Employer SIC rates for category C (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	1.10	1.10	1.10	1.10	1.10	0.10	0.16
Health insurance	5.71	5.71	5.71	5.71	5.71	7.06	7.00
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.20	0.20
Rural worker insurance	0.35	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	1.00
Administration costs	0.44	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	9.15

Source: IESS (2011a, 2011b, 2014b, 2015f, 2016b).

ECUAMOD notes

Employer SICs of three worker categories A–C are simulated in ECUAMOD according to the information available in the data. The categories that cannot be distinguished in the data represent only a small proportion of the workforce and are assumed to pay social contributions in line with the rules for the main category (A).

2.4.3 Self-employed social contributions (tsce_s)

Liability to contributions

Self-employed workers can contribute to SICs on a voluntary basis.

Income base used to calculate contributions

Self-employed workers contribute to social insurance based on their declared gross self-employment income with specific rates. Contributions are not paid in case self-employment income drops below the UBS.⁷

Contribution rates

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 2.9 and 2.10.

⁷ In the case of housewives, the contribution is fixed at 2 USD per month. ECUAMOD does not simulate these cases, which represent only 0.37 per cent of the sample.

Table 2.9: Self-employed SIC rates for category F (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	9.74	9.74	9.74	9.74	9.74	5.86	6.80
Health insurance	5.71	6.06	6.06	5.71	5.71	9.94	9.00
Occupational risk insurance	0.55	0.55	0.55	0.55	0.55	0.20	0.20
Severance pay insurance	—	—	—	3.00	3.00	3.00	3.00
Rural worker insurance	0.70	0.35	0.35	0.70	0.70	0.70	0.70
Disability insurance	—	—	—	—	—	0.10	0.10
Administration costs	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Total	17.50	17.50	17.50	20.50	20.50	20.50	20.60

Source: IESS (2011a, 2011b, 2014b, 2015f, 2016b).

Table 2.10: Voluntary affiliates SIC rates for category G (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Pension insurance	9.74	9.74	9.74	9.74	9.74	5.86	6.80
Health insurance	5.71	6.61	6.61	5.71	5.71	9.94	9.00
Occupational risk insurance	0.55	—	—	0.55	0.55	0.20	0.20
Severance pay insurance	—	—	—	3.00	3.00	3.00	3.00
Rural worker insurance	0.70	0.35	0.35	0.70	0.70	0.70	0.70
Disability insurance	—	—	—	—	—	0.10	0.10
Administration costs	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Total	17.50	17.50	17.50	20.50	20.50	20.50	20.60

Source: IESS (2011a, 2011b, 2014b, 2016b).

An additional category of workers included in the simulation of self-employed SICs is rural workers, who are affiliated to the special rural worker social security regime (*Seguro Campesino*). In order to be member of the rural worker social security regime a person must: (i) have a residency in the rural area or be an artisanal fisherman, (ii) not be affiliated to the general social security regime, (iii) not receive remuneration from an employer, and (iv) not be a permanent employer. The amount of SICs paid by members of the rural worker social security regime is equal to 2.5 per cent of 22.5 per cent of the UBS.

ECUAMOD notes

Self-employed SICs of two worker categories F and G are simulated in ECUAMOD according to the information available in the data.

2.4.4 Armed forces and police social contributions (txcee_s and txcer_s)

Members of the armed forces or the national police contribute to special regimes of social insurance. Members of the armed forces are affiliated to the ISSFA, whereas members of the national police are affiliated to the ISSPOL.

The information available in the input data for ECUAMOD allows us to distinguish those individuals who are affiliated to the IESS from those who are affiliated to the ISSFA or ISSPOL (but not to each of them). For this reason, in addition to SICs to the IESS, ECUAMOD simulates contributions made by members of the armed forces or the national police, as well as government contributions to these regimes (employer contributions).

The rate of SICs for members of the ISSFA is 23 per cent, whereas the rate for members of the ISSPOL is 23.10 per cent. For both regimes, the government contribution is 26 per cent of earnings.

ECUAMOD notes

The level of detail in the input data for ECUAMOD does not allow distinguishing whether an individual is affiliated to the ISSFA or the ISSPOL. For this reason, we simulate jointly SICs to these regimes, with a contribution rate fixed at 23.05 per cent of earnings.

2.5 Personal income tax (tin_s)

Personal income tax is regulated by the LRTI. Major reforms to this tax 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 personal income tax and to improve tax collection.

2.5.1 Tax unit

Personal income tax in Ecuador is assessed at the individual level.

2.5.2 Taxable income

Since 2008, taxable income is composed of earnings from labour (employment and self-employment income) plus contributions to social security, plus extra pay, plus utilities participation (Asamblea Constituyente 2007: Equity Tax Reform Act, Articles 16 and 17).⁸ Before the introduction of the Law of Tax Equity, the pay for the 13th and 14th months and the reserve funds were also part of taxable income.

2.5.3 Exemptions

Until 2007, the main sources of income exemption of personal income tax concerned income from pensions from the IESS. One of the reforms introduced in 2008 included as additional exemptions the pay for the 13th and 14th months, reserve funds, and deductions for old age and disability (Asamblea Constituyente 2007: Equity Tax Reform Act, Article 9, numerals 11, 12, and 15). The pay for the 13th month is equal to one-twelfth of earnings from labour received during the calendar year. The pay for the 14th is equal to one UBS, equal to USD 340 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.

2.5.4 Tax deductions

Deductions for taxable income are composed of contributions to social security and, since 2008, deductions from personal expenditures (Asamblea Constituyente 2007: Equity Tax Reform Act, Article 10, numerals 9 and 16). 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.

2.5.5 Tax base

The tax base for personal income tax calculations is defined as taxable income minus exemptions, minus deductions.

2.5.6 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

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.

progressive, with eight tax bands and rates between 5 and 35 per cent. Table 2.11 presents the tax schedule for the years 2011–17.

Table 2.10: Personal income tax schedule (2011–16)

Per cent	2011	2012	2013	2014	2015	2016	2017
0	0–9,210	0–9,720	0–10,180	0–10,410	0–10,800	0–11,170	0–11,290
5	9,210–11,730	9,720–12,380	10,180–12,970	10,410–13,270	10,800–13,770	11,170–14,240	11,290–14,390
10	11,730–14,670	12,380–15,480	12,970–16,220	13,270–16,590	13,770–17,210	14,240–17,800	14,390–17,990
12	14,670–17,610	15,480–18,580	16,220–19,920	16,590–19,470	17,210–20,670	17,800–21,370	17,990–21,600
15	17,610–35,210	18,580–37,160	19,920–38,830	19,470–39,830	20,670–41,330	21,370–42,740	21,600–43,190
20	35,210–52,810	37,160–55,730	38,830–58,390	39,830–59,730	41,330–61,980	42,740–64,090	43,190–64,770
25	52,810–70,420	55,730–74,320	58,390–77,870	59,730–79,660	61,980–82,660	64,090–85,470	64,770–86,370
30	70,420–93,890	74,320–99,080	77,870–103,810	79,660–106,220	82,660–110,190	85,470–113,940	86,370–115,140
35	93,890–	99,080–	103,810–	106,200–	110,190–	113,940–	115,140–

Source: SRI (2015b, 2016, 2017).

ECUAMOD notes

Personal income tax is simulated under the assumption of full compliance. Simulation of some sort of tax evasion could be included in future versions of the model, based on certain assumptions about people who might be evading tax payments.

2.6 Indirect taxes

2.6.1 VAT (tva_s)

VAT is regulated by the LRTI. Since 2000, the VAT rate has been set at 12 per cent⁹. In 2016, the VAT rate was increased to 14 per cent in all provinces except those hit by the earthquake in April 2016. 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.

2.6.2 Special consumption tax (tex_s)

The ICE represents a form of excise duty that applies to specific products and services, such as alcohol, tobacco products, and automobiles. 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. The rates vary widely with respect to the type of good, from 5 per cent for motor vehicles (up to 3.5 tonnes of cargo and sale price less than or equal to USD 20,000) to 300 per cent for guns and ammunitions.

Five groups of goods are subject to ICE according to Article 82 of the LRTI:

Group 1

- Tobacco products and tobacco substitutes
- Soda drinks
- Perfumes and eaux de toilet
- Video games

⁹ The VAT rate changed from 10 per cent to 12 per cent on 1 January 2000 (reform to the LRTI published in the Supplement R.O. 321 of 18 November 1999).

- Firearms, sporting weapons, and ammunition. except those acquired by the public force
- Incandescent lights except those used as inputs, automotive stoves, heaters and boilers for domestic use that work fully or partially with gas.

Group 2

- Motorized vehicles of up to 3.5 tonnes of cargo
- Hybrid or electric vehicles of up to 3.5 tonnes of cargo
- Airplanes and helicopters except those intended for commercial transport of passengers, cargo, and services; jet skis; tricars; quads; yachts; and recreation boats.

Group 3

- Paid television services
- Casinos, gambling rooms (bingo – mechanics), and other games of chance.

Group 4

- Fees, membership, affiliations, and others that charge their members and users of the social clubs, to provide their services, when the amount exceeds USD 1,500 per year.

Group 5

- Cigarettes
- Alcoholic drinks, including beer

According to Article 75 of the LRTI, three different types of tariffs may apply to goods and services subject to ICE: (i) specific tariffs, which are levied as a fixed charge per unit of good; (ii) ad valorem tariffs, which are levied as a fixed percentage of the value of the good or service; and (iii) mixed tariffs, which are a combination of both previous tariffs.

ICE for four types of goods is considered in our simulations based on the number of observations in data for which consumption of these goods is observed. In particular, we simulate ICE for alcoholic drinks including beer, cigarettes, soda drinks, and perfumes. Table 2.11 presents the tariffs applied to these goods for the years 2011–16.

Table 2.11: Special consumption tax tariffs (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Specific tariffs							
Cigarettes (USD per unit)	0.08	0.08	0.081	0.0862	0.0925	0.16	0.16
Beer (USD per litre of pure alcohol)	6.2	6.08	6.93	6.93	7.1	12	12
Wine and spirits (USD per litre of pure alcohol)	6.2	6.08	6.93	6.93	7.1	7.24	7.24
Ad valorem tariffs (in %)							
Beer	75	75	75	75	75	75	75
Wine and spirits	75	75	75	75	75	75	75
Perfumes	20	20	20	20	20	20	20
Soda drinks	10	10	10	10	10	10	10

Source: Authors' compilation. 2016 & 2017. Resolutions of SRI No. NAC-DGERCGC16-00000520 and 521 published in the Third Supplement of R.O. 912 of December 29. 2016. ECUAMOD notes.

Note: The 20% tariff on perfumes is applied to the tax base, which is calculated applying an increment to the ex-customs price or total production price. The range of the increment applied to the ex-customs price or total production price or total production costs is: a) 150% vif the price is between USD 0.00 to USD 1.50; B) 180% if the price is between USD 1.51 A USD 3.00; C) 240% if the prices is between USD 3.01 A USD 6.00; and D) 300% if the price is USD 6.01 or above .

ECUAMOD notes

In order to calculate the specific part of ICE for beers and alcoholic drinks, the following degrees of alcohol per litre are assumed: 4 per cent for beers, 2 per cent for light beers, 15 per cent for wine, and 35 per cent for all other spirits. For simplicity, the ad valorem part of ICE is applied to all expenditures on beer and alcoholic drinks after VAT has been deducted. This corresponds to

applying the ad valorem tariff based on the sale price, whereas the tax base is based on the ex-fabric or ex-customs price.

3 Data

3.1 General description

The National Survey of Income and Expenditures of Urban and Rural Households (*Encuesta Nacional de Ingresos y Gastos de Hogares Urbanos y Rurales*, ENIGHUR) is a nationally representative cross-sectional survey on income and expenditures of households in Ecuador (ANDA 2012). The survey is conducted approximately every eight years. The latest ENIGHUR is for years 2011–12 and contains information for 39,617 households (Table 3.1). 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.¹⁰

Table 3.1: ECUAMOD database description

ECUAMOD database	EC_2011_a4
Original name	ENIGHUR 2011–12
Provider	National Institute of Statistics and Census (Instituto Nacional de Estadística y Censos, INEC)
Year of collection	2011/2012
Period of collection	04-2011/03-2012
Income reference period	2011/2012
Sample size	39,617 households/153,341 individuals
Response rate	96.79%

Source: Authors' compilation.

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 programmes (HDT, Joaquín 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.

3.2 Data adjustment

Adjustments to the data and variables are kept to a minimum. Individuals recorded as domestic employees in a household have been dropped, together with the children, as information about their own household (e.g. number of children, expenditures) is not available. In total, 103 individuals (0.07 per cent of the sample) were dropped from the original sample but no households were dropped. No adjustments to the weights were made as a result of these drops.

Some data cleaning has been done to ensure that the relationship between household members is consistent. In particular, partner's identifiers had to be generated based on information about identifiers of mothers and fathers, relationship to the head of the household, gender, and age of individuals. Such adjustments concern mostly households where multiple couples are observed.

Imputations were made for a small number of observations which had inconsistent information between expenditure and quantities following the calculation of excise duties in the data preparation, and which resulted in excise duties larger than the expenditure amount. In those cases, mean quantity was used to compute the corresponding excise duties and remove them from expenditure data.

¹⁰ The nine self-represented cities are: Cuenca, Machala, Esmeraldas, Guayaquil, Loja, Manta, Quito, Ambato, and Santo Domingo.

3.3 Imputations and assumptions

3.3.1 Time period

Information about demographic variables in ENIGHUR refers to the time of data collection. Information on earnings refers to the last pay period. Similarly, information about pensions and benefits refers to receipts in the most recent relevant period (e.g. month, last 3 months, last 12 months, etc.) before the interview. Self-employment income is based on the last 6 months. Investment income is based on the last 3-month receipt. For expenditures, information is collected differentiating between daily, monthly, 3-month, 6-month, and yearly expenditures.

All monetary amounts in ENIGHUR are expressed in monthly terms, as required for the ECUAMOD database. In the ECUAMOD calculations, it is implicitly assumed that income is received at the same rate throughout the year. However it should be remembered that this may not be the case and, in particular, that income tax (based on annual income) simulations do not take account of changes that may happen during the year.

3.3.2 Gross incomes

The ENIGHUR dataset contains information about gross monetary incomes.

3.3.3 Disaggregation of harmonized variables

ENIGHUR data includes a single variable covering all pension payments. This variable includes contributory old-age, disability, and survivors' pensions, as well as severance pay and alimony for divorce and children. This single variable is split into five in the ECUAMOD database. One variable corresponds to old-age pension, where the disaggregation is based on the individual's age (attributed if individuals are 60 years or older). The second variable is disability pension, attributed to individuals reporting to be disabled in the data. The third variable is survivors' pension, attributed to widows or widowers as well as orphans. The fourth variable is severance pay, attributed to unemployed individuals who are affiliated to national social insurance according to the data. Finally, for individuals who do not match any of the characteristics used to split the previous four variables, the amount observed in the aggregated variable is recorded under a variable for alimony.

3.4 Updating

To account for any time inconsistencies between the input dataset and the policy year, uprating factors are used. Each monetary variable (i.e. each income component) is updated so as to account for changes in the non-simulated variables that have taken place between the year of the data and the year of the simulated tax-benefit system. Uprating factors are generally based on changes in the average value of an income component between the year of the data and the policy year.

As a rule, uprating factors are provided for simulated and non-simulated income components present in the input dataset. However, in the case of simulated variables, the actual simulated amounts are used in the baseline rather than the uprated original variables in the dataset. Uprating factors for simulated variables are provided so as to facilitate the use of the model in cases when the user wishes to turn off the simulation of a particular variable. The list of uprating factors as well as the sources used to derive them can be found in Table 3.2.

Table 3.2: Raw indices for deriving ECUAMOD uprating factors

Index	Constant name	Value of raw indices							Source	Income component uprated by the index
		2011	2012	2013	2014	2015	2016	2017		
CPI, World Bank	<i>\$HICP</i>	104.47	109.8	112.81	116.84	121.48	123.58	124.09	http://data.worldbank.org/indicator/FP.CPI.TOTL?locations=EC	
GDP deflator, World Bank	<i>\$f_gdp_wb</i>	130.12	136.61	140.84	145.10	141.49	142.78	147.25	http://data.worldbank.org/indicator/NY.GDP.DEFL.ZS?end=2015&locations=EC&start=1998	
GDP deflator	<i>\$f_gdp</i>	130,12	136,61	140,84	145,63	142,39	143,67	143,86	Central Bank of Ecuador	<i>yiy, ydv, yil, yro, ypr</i>
CPI	<i>\$f_cpi</i>	105,41	109,80	112,76	116,90	120,85	122,94	123,45	Central Bank of Ecuador	<i>amrrm, amrtn, ate, aco, aca, afc, bed, bfa, tpr, tscee, tscse, tscer, tin, tis, tva, tseot, twl, tprtf, tca, xmp, xpp, xhc, xhcr, xhcmomi, xhcot, xca, xcd, xfd, xcl, xdf, xhs, xhl, xtr, xpt, xcm, xle, xleot, xed, xrs01, xrs02, xog, xot, ypp</i>
CPI: alcohol and tobacco	<i>\$f_cpi_at</i>	191,10	227,30	245,20	253,60	282,90	325,85	332,52	Central Bank of Ecuador	<i>xal, xtbo1, xtbo2</i>
Average wage (monthly), USD	<i>\$f_yem</i>	307,83	340,47	370,82	396,52	412,90	426,92	437,44	Central Bank of Ecuador	<i>bun, bhl, kfb, kivho, yivwg, yem, yse, ypt, yot, yemre, yemn, ysere, ysenr, yemxp, yemsv, yembo, yemot, yxp, ybo, ypv, yaj, yab, ycd, ywl, ysv, yseag, yotoc</i>
UBS (monthly) USD	<i>\$f_minwage</i>	264	292	318	340	354	366	375	Statutory parameter	<i>bsa, bho, bcrdi, pdi, poa, psu</i>
Unity index	<i>\$f_unit</i>	1	1	1	1	1	1	1		

Notes: Uprating indices for 2017 are calculated based on growth of CPI from December 2016 to November 2017, using statistics from the Central Bank of Ecuador, except for alcohol and tobacco, in which case the CPI for this specific category is used as of November 2016.

Source: Authors' compilation, based on Central Bank of Ecuador (2017).

4 Validation

4.1 Aggregate validation

ECUAMOD results have been validated against external benchmarks. Detailed comparisons of the number of people receiving a given income component and total yearly amounts are shown in the Annex. Both market incomes and non-simulated taxes and benefits in the input dataset as well as simulated taxes and benefits are validated against external official data. The main discrepancies between ECUAMOD results and external benchmarks are discussed in the following sub-sections. Factors that may explain the observed differences are also discussed.

4.1.1 Validation of incomes inputted into the simulation

Table A1 in the Annex shows the number of employed and unemployed in the dataset used for EUROMOD simulations against external benchmarks. The database underrepresents the number of people in work compared with information from the Survey on Employment, Underemployment and Unemployment (*Encuesta Nacional de Empleo, Desempleo y Subempleo*, ENEMDU), whereas there is a more important overestimation of the number of people in unemployment.

Table A2 in the Annex compares the number of recipients of either employment or self-employment income in ECUAMOD's input database with the corresponding information obtained from the number of people in employment and self-employment based on ENEMDU in 2011. No adjustment is made to reflect employment/self-employment trends in subsequent years. The number of recipients of employment income in ECUAMOD represents well the number of people in employment according to ENEMDU, with only a slight overestimation. The number of persons receiving self-employment income is also well represented in the input dataset compared with external information. However, self-consumption has not been considered as part of self-employment income but as a separate income component in ECUAMOD's input data.

Table A3 in the Annex presents the aggregate amount of employment and self-employment income obtained with ECUAMOD. Comparable external statistics are not available to validate these results.

Tables A4 and A5 report the validation of benefits included in ECUAMOD but not simulated. A comparison of the total number of recipients of three pension types is shown in Table A4 in the Annex. It is worth reminding that pension payments in ENIGHUR are recorded in a single variable. Therefore, the total number of recipients of specific pension types is the result of our disaggregation of pension payments. Our disaggregation results in a good representation of the number of old-age pensioners in 2011 (the baseline year) compared with external data. However, the total number of recipients of disability and survivors' pension is underestimated in all years, highlighting the difficulties of disaggregating information for this type of pensions.

Table A5 in the Annex presents a comparison of aggregate amounts of non-simulated benefits, as derived from the input database and as reported by the IESS. Following the same pattern as the number of recipients, the aggregate amount of old-age pension is comparable, but over time we observe some underestimation. On the other hand, disability and survivors' pensions are underestimated as it was the case for the number of recipients of this type of pensions. Finally, the aggregate amount of housing grant derived from the input data is also underestimated compared with information from the Ministry of Urban Development and Housing.

4.1.2 Validation of outputted (simulated) incomes

The numbers of recipients of simulated benefits and payers of simulated taxes and contributions are compared with external benchmarks in Table A6 in the Annex. The external statistics provide information about recipients of social assistance (HDT) and the disability carer benefit (Joaquín Gallegos Lara), as well as number of members to social security and payers of income tax.

Table A6 shows that for HDT, there is an underestimation of around 20 per cent of recipients in 2011. In order to assess eligibility for HDT, we replicated the index of the Social Register with the input data and fixed the threshold of eligibility by identifying the same number of people below the official threshold. The underestimation of recipients of the HDT could be related to discretion as to who is eligible for the transfer, which cannot be captured in our simulations. Results for the disability carer benefit, which are also based on actual benefit receipt in the data, are underestimated compared with external sources. Disability carer benefit is only partially simulated as eligibility depends on the severity of disability and this information is unavailable in the data.

The number of tax payers and employee SIC payers is underestimated compared with data from the IESS and the SRI, as shown in Table A6. The underestimation is important for payers of armed forces and police SICs and even more so for payers of self-employed contributions. It is important to note that external statistics of number of SIC payers disaggregated between

employees and self-employed are only available in 2011 and 2012. Aggregate information on total payers of SICs is disaggregated for other years based on the shares of employees and self-employed payers in 2012.

Tables A7a and A7b in the Annex present a set of figures related to aggregate annual expenditure in social benefits and revenue from taxes and SICs. Results for aggregate expenditures on benefits follow the same pattern as number of recipients of the benefits. The underestimation of amounts of simulated social assistance in comparison to both the input data and external statistics is around 7 per cent in 2011 (Table A7b). The underestimation of disability carer benefit compared with external sources follows a very similar pattern to that observed for the number of recipients (Table A7b).

Tables A7a and A7b further show simulated aggregate amounts of personal income tax and SICs by type of payer. Our simulations overestimate the amount of taxes and SICs with respect to those obtained with the original data (Table A7a). This is probably related to the difficulties of recording this type of deductions in surveys. On the other hand, compared with external sources, we observe an underestimation of tax and social contribution amounts (Table A7b). The underestimation follows the pattern observed in terms of number of tax payers and social insurance contributors. The underestimation of income tax and employee SICs is not too severe, with a gap of around 20 per cent. The underestimation of self-employed and armed forces SICs is more important, in line with the underestimation of the number of payers. The underestimation of income tax and SICs is likely to be related to the fact that, in general, surveys fail to properly capture the top of the income distribution and this is particularly the case for developing countries such as Ecuador. As it was the case for the number of payers, external statistics of SIC amounts disaggregated between employees and self-employed are only available in 2011 and 2012. Aggregate information on total SICs is disaggregated for other years based on the shares of employees and self-employed contributions in 2012.

Additionally, Table A7b provides a comparison of aggregate amount of VAT and excise duties on certain products. Compared with external statistics, VAT and excise duties are in general underestimated by around 50 per cent. However, it is worth reminding that official statistics on VAT include payments by firms, whereas our simulation results are based on consumption of households only. Excises on cigarettes present an important underestimation, with our simulated aggregate amounts representing only about 18 per cent of the aggregate amount of official statistics. On the other hand, excises on perfumes are overestimated by around 36 per cent in 2011.

4.2 Income distribution

The results presented in this section focus on income inequality and poverty. The results are computed for individuals according to their household disposable income (HDI) equalized by the number of people in the household. HDI is calculated as the sum of all income sources of all household members net of income tax and SICs. Equalizing HDI by the number of members of the household is the approach used by the National Institute for Statistics and Census (*Instituto Nacional de Estadística y Censos*, INEC) to calculate income poverty.

Additionally, for the case of relative income poverty we provide results based on HDI equalized by the 'modified OECD equivalence scale', which is the approach used to calculate poverty in developed economies. The weights in the scale are: first adult = 1, additional people aged 14 years and above = 0.5, and additional people aged below 14 years = 0.3.

The comparison of poverty and inequality results needs to be treated with care because the definitions of household income used in ECUAMOD and those used by INEC are not completely comparable. In particular, the approach taken by INEC, based on ENEMDU, is to add back the deductions from SICs and income tax to employment income. Moreover, some social benefits are not included in the income concept used by INEC, as they are not available in ENEMDU. These are compensations from accidents, scholarships, housing grants, and termination payments. Finally, income information in ENIGHUR is recorded at a more disaggregated level than in ENEMDU, which could improve the precision of income information. In addition to inequality and poverty statistics from INEC, we also compare ECUAMOD results to those obtained directly from ENIGHUR for 2011, using a definition of HDI similar to that of ECUAMOD.

4.2.1 Income inequality

Table A8 in the Annex compares income inequality from ECUAMOD results and official statistics based on ENEMDU, using as an inequality measure the Gini coefficient. Income inequality obtained with ECUAMOD slightly underestimates the official estimates, based on ENEMDU. A similar underestimation is observed when ECUAMOD results are compared with those obtained directly from ENIGHUR data in 2011.

4.2.2 Poverty rates

Table A8 also presents statistics on poverty and extreme poverty in Ecuador, derived using ECUAMOD simulations and those published by INEC. Two issues are worth highlighting. First, the official poverty estimates from Ecuador use the concept of absolute poverty. Second, the official estimates are based on ENEMDU. As previously mentioned, the income concept used for the calculation of poverty is not exactly the same as that used in ECUAMOD, and ENIGHUR contains much more detailed information on certain income components. The absolute poverty lines used for the indicators are presented in Table 4.1.

Table 4.1: Poverty and extreme poverty lines in monthly US dollars (2011–17)

	2011	2012	2013	2014	2015	2016	2017
Poverty	72.87	76.34	78.1	81.04	83.79	84.68	84.49
Extreme poverty	41.06	43.02	44.01	45.67	47.22	47.72	47.62

Source: INEC (2017).

Table A8 shows that compared with official poverty estimates, ECUAMOD results underestimate poverty by around 27 percentage points, whereas the underestimation of extreme poverty is more important (around 50 percentage points). The discrepancy is mainly driven by the fact that ENIGHUR, on which ECUAMOD input data are based, contains more detailed income information than ENEMDU, which is used to calculate the official poverty estimates. In fact, ECUAMOD results match better those obtained directly from ENIGHUR data in 2011, with poverty and extreme poverty rates only slightly underestimated. Poverty and extreme poverty estimates are also compared for urban and rural populations, and for three age groups. In all cases, poverty is underestimated in ECUAMOD compared with official statistics based on ENEMDU, whereas a better fit is observed with respect to ENIGHUR data.

Table A9 in the Annex provides information about relative poverty rates calculated with ECUAMOD but now for HDI equivalized using the modified OECD equivalence scale. The aim of Table A9 is to provide a representation of poverty rates with a similar methodology as that used for developed countries. Relative poverty rates obtained at the usual 60 per cent median threshold are relatively similar to those obtained with the absolute poverty threshold, whereas those obtained with a 40 per cent median threshold are 3 percentage point higher than those of absolute extreme poverty. ECUAMOD relative poverty rates are only slightly underestimated, compared with those from ENIGHUR data in 2011.

4.3 Statistics Presenter

A series of variables and income lists have been created in ECUAMOD for the use of the Statistics Presenter tool in the EUROMOD platform. This section describes the elements implemented in the model for the use of the tool

Two constants have been created in the model to define the values of the poverty line (spl) and extreme poverty line (spl01) in Ecuador, according to the values in Table 4.1 above.

A variable defining the size of the household (ses) has been created in the model to be used as equivalence scale for the household, in line with the methodology used by INEC, where poverty and inequality are calculated based on disposable income per capita. The variable is attributed to the head of the household as defined in the survey (dhh), whereas for all other household members the value zero is attributed.

The following income lists have been created in the model for the use of the Statistics Presenter tool:

- “ils_taxind”: indirect taxes, containing VAT and Special Consumption Tax (ICE).
- “ils_sic”: contains social security contributions by employees, self-employed and employers.
- “ils_bch”: child-related benefits. This income list is empty in ECUAMOD as there are no specific child-related benefits in Ecuador.
- “ils_bsa”: social assistance-related benefits, containing the Human Development Transfer and Housing Grants.
- “ils_bsu”: orphan and widowhood-related benefits, containing survivors’ pensions (montepío).
- “ils_bdi”: disability-related benefits, containing disability pensions and the Joaquín Gallegos Lara transfer.
- “ils_bun”: unemployment-related benefits, containing severance payment.
- “ils_tistn”: contains income tax, employee and self-employed social security and turnover tax as recorded in the data. Turnover tax is set to zero in ECUAMOD.
- “ils_dispy2”: disposable income with imputed values for own produce (food and non-food). In ECUAMOD this income list is identical to ils_dispy, which already contains own produce (kivot01 and kivot02) as these variables are part of original income (ils_origy).
- “ils_bendata”: benefits that are collected in the data and also simulated in the model, containing the Human Development Transfer and the Joaquín Gallegos Lara transfer.
- “ils_xhh_s”: simulated consumption, which is defined as: household expenditure as recorded in the data (xhh) minus simulated taxes (ils_taxsim), minus simulated employee SICs (ils_sicce), minus simulated self-employed SICs (ils_sicse), plus direct taxes from the data (ils_tistn), plus simulated benefits (ils_bensim), minus benefits in the data (ils_bendata).

4.4 Summary of ‘health warnings’

Pension payments in ENIGHUR are recorded in a single variable. In order to provide specific information on different types of pension income (e.g. old-age pensions, disability pensions, survivors’ pensions), the information from ENIGHUR was disaggregated based on personal characteristics of the recipients of pension payments. Therefore, there will be inevitably some bias due to benefit splitting.

There is underrepresentation of people with higher incomes in the ENIGHUR survey, which are likely to result in an underestimation of personal income tax and SICs.

The comparison of poverty and inequality results should be taken with care. Income information in ENIGHUR is much more detailed than that of ENEMDU, which is used to calculate official poverty and inequality estimates. Using the original ENIGHUR data, poverty estimates are considerably lower than those obtained with ENEMDU. Due to the discrepancies between both data sources, ECUAMOD results underestimate poverty and inequality compared with ENEMDU.

The household income concept used for calculations of official poverty statistics also differs from the concept of HDI used in ECUAMOD. For instance, taxes and SICs are not deducted from the measure of income used for poverty and inequality calculations.

Extreme poverty rates are importantly underestimated in ECUAMOD compared with official statistics based on ENEMDU, but only a minor underestimation is observed compared with statistics from ENIGHUR data in 2011.

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Annex: Macrovalidation tables

Table A1: Number of employed and unemployed (in thousands)

	ECUAMOD				External							Ratio				
	2011	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	
Number of employed	5,727.3	6,304.8	6,424.8	6,664.2	6,921.1	7,140.6	7,463.6	7,639.7	0.91	0.89	0.86	0.83	0.80	0.77	0.75	
Number of unemployed	318.9	276.8	276.2	288.7	273.4	357.9	410.4	403.7	1.15	1.15	1.10	1.17	0.89	0.78	0.79	

Note: The population of reference of INEC statistics is working age population aged 15 years or more.

Source: INEC (2016b).

Table A2: Market income in EUROMOD: Number of recipients (in thousands)

	ECUAMOD				External							Ratio				
	2011	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	
Employment income	3,840.5	3,656.8	3,816.4	4,158.5	4,304.9	4,420.1	4,396.0	4,499.8	1.05	1.01	0.92	0.89	0.87	0.87	0.85	
Self-employment income	2,588.4	2,648.0	2,608.5	2,505.8	2,616.2	2,720.6	3,067.5	3,139.9	0.98	0.99	1.03	0.99	0.95	0.84	0.82	

Note: The population of reference of INEC statistics is working age population aged 15 years or more.

Source: INEC (2016b, 2016c).

Table A3: Market income in EUROMOD: Annual amounts (in millions)

	ECUAMOD							External							Ratio							
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	
Employment income	17,588	19,452	21,187	22,655	23,591	24,392	24,993	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Self-employment income	9,495	10,501	11,437	12,230	12,735	13,168	13,492	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: N/A, not available.

Source: Authors' compilation.

Table A4: Tax–benefit instruments included but not simulated in EUROMOD: Number of recipients/payers (in thousands)

Benefits	ECUAMOD							External							Ratio						
	2011	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017						
Old-age pensions ^a	291.6	298.3	302.9	331.8	362.7	393.1	426.0	446.4	0.98	0.96	0.88	0.80	0.74	0.68	0.65						
Disability pensions ^a	11.0	21.2	23.1	24.9	27.7	30.0	32.5	34.6	0.52	0.48	0.44	0.40	0.37	0.34	0.32						
Survivors' pensions ^a	23.8	110.2	115.9	121.4	127.8	138.5	150.1	154.7	0.22	0.21	0.20	0.19	0.17	0.16	0.15						
Housing grant	9.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A						

Note: N/A, not available.

Source: ^a IESS (2015e).

Table A5: Tax–benefit instruments included but not simulated in EUROMOD: Annual amounts (in millions)

Benefits	ECUAMOD							External							Ratio						
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	2011	2017	2013	2014	2015	2016	2017
Old-age pensions ^a	1.184	1.310	1.427	1.525	1.588	1.642	1.682	1.152	1.361	1.736	2.108	2.400	2.724	3.049	1.03	0.96	0.82	0.72	0.66	0.60	0.55
Disability pensions ^a	33	37	40	43	45	46	47	63	73	86	103	115	128	142	0.53	0.51	0.47	0.42	0.39	0.36	0.33
Survivors' pensions ^a	56	62	67	72	75	77	79	218	249	277	315	345	377	409	0.26	0.25	0.24	0.23	0.22	0.21	0.19
Housing grant ^b	38	42	46	49	51	53	54	119	168	162	104	126	121	116	0.32	0.25	0.28	0.47	0.40	0.44	0.47

Note: N/A, not available.

Source: ^a IESS (2015e); ^b Ministry of Finance (2015).

Table A6: Tax–benefit instruments simulated in EUROMOD: Number of recipients/payers (in thousands)

	ECUAMOD							ENIGHUR			External							Ratio						
	2011	2012	2013	2014	2015	2016	2017	2011	Ratio	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	
Benefits																								
Social assistance benefits ^a	1,523	1,523	1,523	1,118	1,118	1,118	1,118	1,681	0.91	1,854	1,910	1,717	1,120	1,099	1,037	1,020	0,82	0,80	0,89	1,00	1,02	1,08	1,10	
Disability carer benefit ^b	9	9	9	9	9	9	9	9	1.00	14	17	18	20	23	25	27	0.62	0.52	0.48	0.44	0.39	0.36	0.33	
Taxes and social insurance contributions (SICs)																								
Income tax ^c	331	368	403	444	448	449	471	35	9.53	472	494	503	510	492	511	511	0.70	0.75	0.80	0.87	0.91	0.88	0.88	
Employee SIC ^d	2,047	2,047	2,087	2,087	2,087	2,087	2,087	1,836	1.11	2,510	2,763	2,944	3,113	3,517	3,659	3,730	0.82	0.74	0.71	0.67	0.59	0.57	0.56	
Armed forces and police SIC	56	56	56	56	56	56	56	N/A	N/A	84	87	90	93	87	92	101	0.67	0.64	0.62	0.60	0.64	0.61	0.55	
Self-employed ^d SIC	307	307	307	307	307	307	307	74	4.16	1,093	1,187	1,238	1,256	1,292	901	1,099	0.28	0.26	0.25	0.24	0.24	0.34	0.28	
Employers SIC	1,736	1,736	1,776	1,776	1,776	1,776	1,776	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Government SIC for armed forces and police	56	56	56	56	56	56	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

Note: External statistics of SIC payers disaggregated between employees and self-employed are only available in 2011 and 2012. Aggregate information on total payers of SICs is disaggregated for other years based on the shares of employees and self-employed payers in 2012. N/A, not available.

Source: ECUAMOD calculations; ^a *Registros del Programa Bono de Desarrollo Humano* – MIES (n.d.a); ^b *Informe de Gestión* – MIES; ^c the estimates have been supplied by Nicolás Oliva and Nestor Villacreses based on administrative data using the personal income tax calculator of the Internal Revenue Service (SRI); ^d IESS (2013, 2014c).

Table A7a: Tax–benefit instruments simulated in EUROMOD: Annual amounts (in millions)

	ECUAMOD							ENIGHUR							Ratio						
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017
Benefits																					
Social assistance benefits	656	656	937	687	687	687	687	706	780	850	909	946	978	¹⁰⁰²	0.93	0.84	1.10	0.76	0.73	0.70	0.69
Disability carer benefit	26	26	26	26	26	26	26	24	26	29	31	32	33	³⁴	1.07	0.97	0.89	0.83	0.80	0.77	0.76
Taxes and SICs																					
Income tax	615	711	804	896	933	965	1.011	19	20	21	21	22	23	²³	31.79	35.31	38.90	41.81	42.09	42.78	42.78
Employee SIC	1.503	1.662	1.825	1.970	2.051	2.121	2.0.21	1.322	1.377	1.414	1.466	1.516	1.542	^{1.548}	1.14	1.21	1.29	1.34	1.35	1.38	1.31
Armed forces and police SIC	218	241	263	281	293	302	310	N/A	N/A	N/A	N/A	N/A	N/A	^{N/A}	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Self-employed SIC	456	504	549	587	611	632	648	268	279	286	297	307	312	³¹³	1.70	1.81	1.92	1.98	1.99	2.02	2.07
Employers SIC	1.361	1.505	1.655	1.769	1.842	1.905	1.952	N/A	N/A	N/A	N/A	N/A	N/A	^{N/A}	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Government SIC for armed forces and police	246	272	296	317	330	341	350	N/A	N/A	N/A	N/A	N/A	N/A	^{N/A}	N/A	N/A	N/A	N/A	N/A	N/A	N/A
VAT	1.708	1.779	1.827	1.894	1.958	2.295	2.003	592	617	634	657	679	691	⁶⁹⁴	2,88	2,88	2,88	2,88	2,88	3,32	2,89

Note: N/A, not available.

Source: ECUAMOD calculations and ENIGHUR.

Table A7b: Tax–benefit instruments simulated in EUROMOD: Annual amounts (in millions)

	ECUAMOD							External							Ratio						
	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017
Benefits																					
Social assistance benefits ^a	656	656	937	687	687	687		706	732	1,035	865	651	N/A		0.93	0.90	0.90	0.79	1.06	N/A	
Disability carer benefit ^b	26	26	26	26	26	26		41	49	53	58	62	N/A		0.62	0.52	0.48	0.44	0.41	N/A	
Taxes and SICs																					
Income tax ^c	615	711	804	896	933	966		784	856	935	1,022	1,019	N/A		0.78	0.83	0.86	0.88	0.92	N/A	
Employee SIC ^d	1,503	1,662	1,825	1,970	2,051	2,121		1,842	2,216	2,573	2,858	3,303	3,991		0.82	0.75	0.71	0.69	0.62	0.53	
Armed forces and police SIC ^d	218	241	263	281	292	302		416	442	472	505	528	559		0.52	0.55	0.56	0.56	0.55	0.54	
Self-employed SIC ^d	456	504	549	587	611	632		802	952	1,082	1,153	1,214	983		0.57	0.53	0.51	0.51	0.50	0.64	
Employers SIC	1,361	1,505	1,655	1,769	1,842	1,905		N/A	N/A	N/A	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	
Government SIC for armed forces and police ^d	246	272	296	317	330	341		455	471	502	459	488	491		0.54	0.58	0.59	0.69	0.68	0.69	
VAT ^e	1,710	1,781	1,829	1,896	1,960	2,241		3,073	3,455	4,096	4,513	4,778	N/A		0.56	0.52	0.45	0.42	0.41	N/A	
ICE alcohol ^e	13	13	14	14	15	15		24	34	43	45	44	N/A		0.55	0.39	0.33	0.32	0.34	N/A	
ICE beer ^e	55	57	60	62	64	73		135	152	170	166	188	N/A		0.41	0.37	0.35	0.37	0.34	N/A	
ICE cigarettes ^e	27	27	28	30	32	55		149	156	176	178	195	N/A		0.18	0.18	0.16	0.17	0.16	N/A	
ICE soda drinks ^e	20	21	22	22	23	23		43	51	57	53	59	N/A		0.47	0.41	0.38	0.42	0.39	N/A	
ICE perfume ^e	27	28	28	30	31	31		20	14	8	19	44	N/A		1.36	1.93	3.76	1.51	0.70	N/A	

Note: External statistics of SIC payers disaggregated between employees and self-employed are only available in 2011 and 2012. Aggregate information on total payers of SICs is disaggregated for other years based on the shares of employees and self-employed payers in 2012. N/A, not available.

Source: ECUAMOD calculations; ^a *Registros del Programa Bono de Desarrollo Humano – MIES* (n.d.b); ^b *Informe de Gestión – MIES* (n.d.b); ^c the estimates have been supplied by Nicolás Oliva and Nestor Villacreses based on administrative data using the personal income tax calculator of the SRI; ^d IESS (2013, 2014c); ^e SRI (2015a).

Table A8: Absolute poverty rates and income inequality

	ECUAMOD							ENIGHUR	Ratio	External (ENEMDU)							Ratio						
	2011	2012	2013	2014	2015	2016	2017	2011	2011	2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	
Poverty																							
Total	20.9	19.0	15.8	15.9	15.8	15.1	14.3	21.6	0.96	28.6	27.3	25.6	22.5	23.3	22.9	21.5	0.73	0.70	0.62	0.71	0.68	0.66	0.67
Urban	12.4	10.9	8.5	8.7	8.5	8.0	7.5	13.2	0.94	17.4	16.1	17.6	16.4	15.7	15.7	13.2	0.71	0.67	0.48	0.53	0.54	0.51	0.57
Rural	37.9	35.5	30.5	30.5	30.4	29.5	28.1	38.5	0.98	50.9	49.1	42.0	35.3	39.3	38.2	39.3	0.74	0.72	0.72	0.86	0.77	0.77	0.72
0–18 years	27.2	24.8	20.8	20.9	20.7	19.8	18.7	28.1	0.96	37.3	36.2	34.7	30.0	31.0	31.9	28.9	0.73	0.68	0.60	0.70	0.67	0.62	0.65
19–64 years	15.5	14.0	11.5	11.6	11.5	11.0	10.3	16.1	0.96	22.8	21.7	19.9	17.6	18.3	18.8	16.9	0.68	0.65	0.58	0.66	0.63	0.58	0.61
65+ years	24.5	23.3	19.2	19.4	19.7	19.2	18.5	25.3	0.97	29.7	27.4	20.9	18.2	20.1	18.0	17.6	0.83	0.85	0.91	1.06	0.98	1.07	1.05
Extreme poverty																							
Total	5.8	5.4	4.0	4.2	4.2	4.0	3.8	6.1	0.95	11.6	11.2	8.6	7.7	8.5	8.7	7.9	0.50	0.48	0.46	0.54	0.50	0.46	0.48
Urban	2.2	2.0	1.4	1.5	1.5	1.4	1.4	2.6	0.85	5.0	5.0	4.4	4.5	4.4	4.5	3.3	0.44	0.40	0.31	0.34	0.35	0.32	0.41
Rural	13.0	12.2	9.3	9.5	9.6	9.2	8.7	13.3	0.98	24.6	23.3	17.4	14.3	17.0	17.6	19.7	0.53	0.52	0.53	0.66	0.56	0.52	0.44
0–18 years	7.5	6.9	5.4	5.6	5.7	5.4	5.1	8.1	0.93	15.6	15.1	12.4	10.9	11.8	11.9	11.5	0.48	0.46	0.43	0.52	0.48	0.48	0.44
19–64 years	4.1	3.8	3.0	3.1	3.1	2.9	2.8	4.2	0.98	8.8	8.3	6.5	5.7	6.4	6.8	5.9	0.46	0.45	0.46	0.54	0.48	0.43	0.47
65+ years	8.5	8.5	4.0	4.1	4.2	4.1	3.9	8.6	0.99	13.0	12.9	5.0	4.6	5.7	6.3	4.8	0.65	0.66	0.80	0.89	0.75	0.65	0.82
Inequality																							
Gini	46.0	46.1	45.6	46.0	46.0	46.1	46.2	47.3	0.97	47.3	47.7	48.5	46.7	47.6	46.6	45.9	0.97	0.97	0.94	0.99	0.97	0.99	1.00

Notes: Computed for individuals according to their household income equalized by the number of household members. ECUAMOD household income corresponds to household disposable income (HDI) calculated as the sum of all income sources of all household members net of income tax and SICs. INEC household income corresponds to the sum of all income sources (available in ENEMDU) of all household members but using employment income before taxes and SICs.

Source: ECUAMOD calculations and ENIGHUR; external figures come from INEC (2016a), based on ENEMDU.

Table A9: Relative poverty rates by region and age

	ECUAMOD						ENIGHUR	Ratio	
	2011	2012	2013	2014	2015	2016	2017	2011	
Relative poverty (different thresholds)									
40% of median HDI	8.9	9.0	8.4	8.9	9.0	9.1	9.2	9.3	0.98
50% of median HDI	14.6	14.9	14.1	14.8	14.9	14.9	15.0	15.1	0.99
60% of median HDI	21.6	21.9	21.0	21.8	21.8	21.9	21.9	22.2	0.99
70% of median HDI	29.2	29.4	28.9	29.5	29.4	29.5	29.5	29.6	1.00
Relative poverty by subgroups (60% median HDI)									
Urban	12.7	12.9	12.4	13.2	13.1	13.1	13.1	13.6	0.96
Rural	39.4	39.9	38.5	39.3	39.4	39.5	39.7	39.6	1.00
0–18 years	26.0	26.4	25.4	26.5	26.5	26.5	26.6	26.1	1.02
19–64 years	17.9	18.1	17.5	18.1	18.1	18.1	18.2	17.5	1.04
65+ years	16.4	16.6	16.0	16.7	16.7	16.7	16.7	34.5	0.48

Notes: Computed for individuals according to their HDI equalized by the modified OECD equivalence scale. HDI are calculated as the sum of all income sources of all household members net of income tax and SICs.

Source: EUROMOD calculations and ENIGHUR.