

# SOUTHMOD

Country report

# Peru

PERUMOD v2.4

2019–2022

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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](#)), Southern African Social Policy Research Insights ([SASPRI](#)) and the International Inequalities Institute at the London School of Economics and Political Science ([LSE](#)) 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 Bolivia (BOLMOD), Colombia (COLMOD), Ecuador (ECUAMOD), Ethiopia (ETMOD), Ghana (GHAMOD), Mozambique (MOZMOD), Peru (PERUMOD), Rwanda (RWAMOD), Viet Nam (VNMOD), Tanzania (TAZMOD), Uganda (UGAMOD), and Zambia (MicroZAMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents PERUMOD, the SOUTHMOD model developed for Peru. This work was carried out by UNU-WIDER in collaboration with the Universidad del Pacífico (UP) in Peru.

The results presented in this report are derived using PERUMOD version 2.4 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 PERUMOD results against external data sources. For further information on access to PERUMOD and other SOUTHMOD models see the [SOUTHMOD page](#).

The PERUMOD model and its documentation in this country report has been prepared within the UNU-WIDER project [SOUTHMOD – simulating tax and benefit policies for development \(Phase 2\)](#), which is part of the [Domestic Revenue Mobilization](#) programme. The programme is financed through specific contributions by the Norwegian Agency for Development Cooperation (Norad). For more information, see the [SOUTHMOD project page](#).

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## Acronyms

AFP	Pension Fund Manager (Administradora de Fondo de Pensiones)
CBSSP	Fisherman's Social Security and Benefit Fund (Caja de Beneficios y Seguridad Social del Pescador)
CIF	Cost, insurance, and freight import value
CCT	Conditional Cash Programme (Programa de efectivo condicional)
CTS	Compensation of length of service (Compensación por Tiempo de Servicios)
DNI	Document of identification (Documento Nacional de Identificación)
EPS	Health Promoting Entity (Entidad Promotora de Salud)
ESSALUD	Social Health Insurance (Seguro Social de Salud)
IGV	Sales Tax (Impuesto Gravado a las Ventas)
IPRESS	Lending Institutions of Health Services (Instituciones Prestadoras de Servicios de Salud)
LIR	Income Tax Law (Ley de Impuesto a Renta)
MINSAL	Ministry of Health (Ministerio de Salud)
MYPE	Micro and Small Business (Micro y pequeña empresa)
ONP	Pension Normalization Office (Oficina de Normalización Previsional)
SIC	Social insurance contributions (Contribuciones para el seguro social)
SISFOH	Household Targeting System (Sistema de Focalización de Hogares)
SNP	National Pension System (Sistema Nacional de Pensiones)
SUNAT	National Superintendency of Customs and Tax Administration (Superintendencia Nacional de Aduanas y de Administración Tributaria)

# 1 Basic Information

## 1.1 The tax-benefit system

Sol Peruano (originally nuevos soles) is the national currency of Peru. The exchange rate to US dollars was US\$1 = S/3.36 in December 2019; US\$1= S/3.61 in December 2020; and US\$1= S/4.00 in December 2021.

Each worker has the right to choose one of two pension systems: the public scheme, a defined benefits regime managed by the Pension Normalization Office (Oficina de Normalización Previsional, ONP), or the private scheme, consisting of individual saving accounts managed by Pension Fund Manager (Asociación de fondos privados, AFP).

The state old-age pension is a pay-as-you-go type of scheme. Retirement under this system depends on two parameters: the years of contributions and the average of your last effective remunerations of your working life, according to current law (National Pension System, SNP). Additionally, the minimum age for receiving a retirement pension depends on gender: for women the minimum age is 50 years with at least 25 years of contributions; for men the minimum age is 55 years with at least 30 years of contributions. The minimum old-age pension is S/500 and the maximum is S/893.<sup>1</sup>

Private pension funds, on the other hand, are part of a fully-funded system where contributions are deposited into a personal account administrated by a private fund which uses them for financial investments. Future benefits depend on contributions and returns on investments. There is no minimum years of contributions for accessing the retirement pension; only a minimum age of 65.

The minimum legal working age in Peru is 15 years. For workers aged 15–17 years, work must combine with study and employers must ensure this condition is met. A mandatory medical certificate must be issued by the medical services of the health sector, or social security, certifying the physical, mental, and emotional wellbeing of adolescents carrying out work.

There are eligibility criteria for households accessing most social programmes (e.g., the conditional cash programme 'Juntos') with (multi-dimensional) socioeconomic classifications of poor or extreme poor household, according to the Household Targeting System (SISFOH).

In Peru, the fiscal year runs from 1 January to 31 December. The authority in charge of national taxes is the National Superintendency of Customs and Tax Administration (SUNAT). Income is taxed individually (Presidencia de la República del Perú, 2004, Decreto Supremo N.º179-2004-EF, Articles 33–34). The tax rate depends on the category of the contributor. Withholdings are made for tax payments. According to the Tax Code (Código Tributario), where withholdings exceed personal income tax liabilities taxpayers can request reimbursement. Where withholdings are lower than tax liabilities, taxpayers need to fill in a tax form and pay the difference. Additionally, local taxes are collected by each municipality and are levied on properties, vehicles, and industrial and commercial activities.

There are no 'authentic' means-tested social programmes in Peru. There are two main safety net instruments: 'Juntos' a conditional cash transfer programme to promote health and education among children, and 'Pension 65' a non-contributory pension scheme for poor individuals with no pension. Both

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<sup>1</sup> Under this system, if all the conditions are not met the worker would not receive a pension.

instruments employ a proxy means-testing system based on a composite welfare index, known as SISFOH (Household Targeting System, Sistema de Focalización de Hogares).

The information and data contained in the National Household Survey (Encuesta Nacional de Hogares, ENAHO) 2019–21, which is representative at the national and regional level, are freely accessible under the Organic Law on Transparency and Access to Public Information (Congreso de la República del Perú, 2002, Ley 27806).

## 1.2 Social benefits

### 1.2.1 Contributory social protection

The social protection and safety net in Peru is divided in two exclusive systems: contributory and non-contributory. The contributory system is intrinsically connected to the formal labour market.

**Benefit 1:** Old-age pensions (Pensión ordinaria por vejez): if a worker is in the private pension system their mandatory monthly contribution is 10 per cent of their gross salary. The pension the worker would receive depends on the size of funds at retirement. There is no minimum of contributions to receive a pension, unless a worker is trying retire early or wants to access to some particular benefits (of the system) such as disability, survivor, and burial expenses insurance.

If a worker is in the public sector fund (ONP), the worker must contribute for at least 20 years to receive a pension. As in any pay-as-you-go scheme, the fiscal stability depends on future contributions of younger workers to the ONP. To be precise, the system redistributes the contributions of younger workers to payments to old-age pensioners.

**Benefit 2:** Invalidation pensions (Pensión por invalidez): a worker is considered eligible for invalidity pension if during the last three years contributed for at least 12 months and has been declared with a loss of at least 50 per cent of labour capacity due to a non-labour related accident or illness. ONP contributors will receive 50 per cent of their referential income with a maximum of S/893, and if the contributor requires permanent care of an extra person they will receive a bonus that does not exceed the maximum pension. If a person has insurance in the private (AFP) system, the pension depends on the disability grade: 'partial' (more than 50 per cent of labour capacity but less than 66.6 per cent); 'total' (more than 66.6 per cent of labour capacity). In the partial grade the contributor will receive 50 per cent of average income, and in the total grade the contributor will receive 70 per cent of average income. If the contributor does not have AFP insurance, they will receive the amount of the pension according to the accumulated capital (ONP and AFP)

**Benefit 3:** Survivors' pensions (Pensión de sobrevivientes): family relatives (spouse or children under 18 or other economic dependents) of a deceased worker or pensioner, due to a non-labour related accident or illness, are entitled to a pension only if the worker's contributions during the last three years prior to death are at least of 12 weeks. In the ONP the pension depends on the relation of the deceased worker to the family member: widow/widower, orphan, or other family member/relative. Widows/widowers and orphans receive the 50 per cent of the pension of the deceased worker. The relative receives 20 per cent of the pension of the deceased worker. In AFP, relatives can receive the pension in different modalities.

- (1) The scheduled pension consists of a monthly pension (of the residue) from the personal fund.
- (2) The family life income scheme consists of transferring the totality of the funds to an insurance company in charge, and from then on, of a life income for the survivors.
- (3) The temporary income with deferred life income that consists in the redistribution of the funds to the AFP and an insurance company.

(4) Staggered rent that consists of a transfer of funds to the insurance company for a life annuity in soles (or dollars) divided into two tranches.

**Benefit 4:** Private unemployment scheme (Compensación por Tiempo de Servicio): mandatory for salaried formal workers. The contribution is exclusively paid by the employer and is equivalent to 1.5 months' wage for each year of work, but with a maximum of 12 wages. Also, there is a Compensation of Length of Service (CTS) that is equivalent to one-twelfth of the remuneration received for the year.

**Benefit 5:** Severance compensation: to be eligible for severance pay compensation, a person must have worked at least four hours a day, for longer than a trial period of three months. The mandatory payment for job termination (not related to the approved causes by the government) is equal to 1.5 months' wages for each full year of work with a cap at 12 remunerations. However, if the person has been working for less than five years and has a fixed-date contract, the payment would be equivalent to 1.5 months' wages for each month the person is not working, until the expiration of the contract, with a limit of 12 remunerations. Workers in small or micro-firms, as well as agricultural workers, have specific arrangements.

**Benefit 6:** Extra salaries: mandatory payments for salaried or dependent workers. The extra payment is equal to one month's wages, and it is paid in July and December.

**Benefit 7:** Workers' profit participation: workers, on the payroll of a company with more than 20 employees have the right to participate in the company's profits. The rate of participation depends on the industry related: 10 per cent for fishing, 10 per cent for telecommunications, 10 per cent for industry, 8 per cent for minerals, 8 per cent for restaurants and commerce, and 5 per cent for other. The amount of profit will be distributed according to the following rules: 50 per cent will be distributed based on the days worked within a year, and the other 50 per cent will be in proportion to the remuneration of each employee.

### 1.2.2 Non-contributory social protection

**Benefit 5:** Pension 65: is a state-subsidised pension programme.<sup>2</sup> It consists of a monthly benefit of around S/250 payable every second month for low-income elderly. The programme is means-tested, beneficiaries must be classified through SISFOH, and must be at least 65 years old. Despite targeting poor elderly, the programme is not universal for the population.<sup>3</sup>

**Benefit 6:** Juntos: is a conditional cash programme (CCT) which aims at promoting human capital accumulation and alleviating poverty by complementing income with S/100 per month to families that meet the criteria. It was launched in 2005 with two objectives: in the short term, increase consumption especially with regard to children, and in the medium term, prevent transmission of intergenerational poverty. All households classified in SISFOH with at least one child are eligible to receive the transfer, but with the condition that the children will receive education and good nutrition. It is not a permanent monetary benefit, as every four years the programme evaluates recipients and if they are no longer in poverty the benefit is stopped; those recipients who still remain in poverty are given an incentive but 20 per cent less.

**Benefit 7:** Housing grant (Techo Propio): the aim of this grant is to provide financial assistance to families living in Peru to help them to finance their first property purchase, the construction of a property on their own land, or improvement of their current property. Eligible households must (i) be permanently

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<sup>2</sup> It has its origins in 2011 as an in-kind and in-cash transfer programme for the elderly.

<sup>3</sup> The government does not have the full capacity to identify the target population. There is a segment of the population that does not have national identity documentation (Documento Nacional de Identidad, DNI), and another segment is not registered in the SISFOH.

resident in Peru; (ii) be older than 18 years and younger than 25 years, or if living with a disabled member of the household older than 25 years; (iii) not own another house in Peru, in the 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 S/3,715 to buy a house, below S/2715 to construct or improve a house; and (v) intend to purchase or build a property with a maximum value of S/464,200. The amount of the grant is between S/7,300–25,700.

**Benefit 8:** Temporary independent transfer (Bono Independiente): is a one-time transfer to self-employed workers in poor households of about US\$220. The programme was implemented in April 2020.

**Benefit 9:** Temporary transfer for rural households (Bono Rural): is a one-time transfer to poor households living in rural areas of around US\$220, and who had not received any other economic support at the time the transfer/programme was implemented (second quarter of 2020).

**Benefit 10:** Temporary transfer to stay at home (Bono Yo me quedo en casa): is a one-time transfer to poor households living in high sanitary-risk areas (given the pandemic) of around US\$110.

**Benefit 11:** Temporary universal family transfer (Bono Familiar Universal): is a one-time transfer to poor households without any income (from formal sources) of around US\$220. The programme was implemented in the second quarter of 2020.

**Benefit 12:** Temporary sickness absence: when a worker is unable to work due to a work-related cause, they are entitled to receive full wages for each day of absence up to 20 days. If the sickness continues for 120 days after, then the worker must solicit a subvention according to the duration of the sickness with a maximum time of 11 months and 10 days.

**Benefit 13:** Maternity leave: this consists of 98 days of paid leave for women: 49 pre-natal and 49 post-natal. To be eligible, the worker must be registered in the social welfare of ESSALUD. The benefit consists of a payment by ESSALUD equivalent to the wage on the last month before the leave.

**Benefit 14:** Lactation subsidy: this is granted by ESSALUD to the mother of the living new-born child. It is a single payment of S/820. In the case of multiple births, the allowance is paid for each child. In addition, the subsidy holder must be accredited and working in the month of birth of the new-born.

**Benefit 15:** Paternity leave: this consists of 10 working days of paid leave for men starting at childbirth. To be eligible, the worker must have contributed for the whole pregnancy period. The benefit consists of a payment by the employer equivalent to the daily wage on the previous month of the leave.

**Benefit 16:** Severance pay insurance: on the event of unemployment, a worker can withdraw the complete balance of their severance account. The payment is 1.5 times the wage multiplied by years of work. If the dismissal is arbitrary the worker must receive 1.5 times the equivalent of a month's wage for every missing month. For both instances there is a maximum of 12 months' wages.

**Benefit 17:** Vacation: this consists of 30 days of vacation for every year of service in the general regimen, but in the MYPE regimen it consists of 15 days for every year of service.

### 1.3 Social contributions

Social insurance contributions (SICs) finance pensions, and other contributory benefits (e.g., severance pay). Contributions determine eligibility and amount of contributory benefits. There are two large SICs: pension contribution and health contribution. Contributions shall not be based on a labour income lower than the minimum wage.



**Social insurance contribution 1:** Pension contribution: mandatory for salaried and dependent workers. It consists of a payment of 10 per cent of labour income if the worker belongs to the private pension system (AFP); or 13 per cent of labour income if the worker belongs to the public pension system (ONP).

The differences between these types of pensions are that, generally speaking, the ONP system works relatively similar to a redistribute mechanism between the contributions of young workers and old-age pensioners., while and the AFP system works as a forced private retirement fund.

**Social insurance contribution 2:** Health contributions: mandatory for salaried and dependent workers. They consist of a payment of 9 per cent of labour income. Contributions are the sole responsibility of the employer. However, in the case of pensioners formerly affiliated to the Fisherman's Social Security and Benefit Fund (CBSSP), the contribution is equivalent to four per cent of the monthly pension accrued, and it is paid by the pensioner.

## 1.4 Taxes

### 1.4.1 National taxes

**Income tax:** the categories of income tax relate to source of income and whether it is a person or a corporation. Table 1.2 shows the categories.

**Table 1.1: Classification of Income Tax**

	Category	Rents
Capital Income	First category	Lease, sub-lease and transfer of assets.
	Second category	Other capital income not included in the first category.
Business Income	Third category	Commerce, industry, and other businesses considered by the income tax law
Labour Income	Fourth category	Independent work.
	Fifth category	Of the work in relation to dependence and other income from independent work expressly indicated by the LIR.

Source: authors' compilation.

**Tax 1:** Personal income tax (Impuesto a la renta de personas naturales – fourth and fifth categories): in Peru, income is taxed individually. Personal income tax is applied to incomes related to work by dependent or independent workers. There are two deductions to taxable income. The first one is a universal deduction of seven tax units (UITs),<sup>4</sup> while the second one comes from personal expenditures (related to restaurants, bars, housing/rent, SSC for household workers, medical services, and other professional services), up to a maximum of three UITs. The tax base is defined as taxable income minus deductions. The tax schedule has six bands and rates between 0–30 per cent.<sup>5</sup>

**Tax 2:** Income tax on housing rent (first category): this is a tax on income from rent from real estate (apartments and land) and vehicles. The tax rate is equal to five per cent of the rental amount.<sup>6</sup>

<sup>4</sup> UIT refers to a tax unit (Unidad Impositiva Tributaria). Its value is updated annually at the beginning of the year. For 2020, its value was close to US\$1,200.

<sup>5</sup> 0%, 8%, 14%, 17%, 20%, and 30%.

<sup>6</sup> At the end of the fiscal year, the revenue collected (related to 5% of the rent) is compared to 5% of 6% of the value of the property. If the first amount is lower than the second, the difference should be paid to the Peruvian Tax Collection Superintendence (Superintendencia Nacional de Aduanas y de Administración Tributaria, SUNAT).

**Tax 3:** Corporate profit tax (third category): is applied on corporate taxable income (gross income minus expenditure and deductions). Until 2014, the applicable rate was 30 per cent, which went down to 28 per cent for 2015 and 2016. From 2017 onwards the figure is 29.5 per cent.

**Tax 4:** Value-added tax (Impuesto general a las ventas, IGV): this is an indirect tax on the purchase of all goods and services with a rate of 18 per cent. It applies to national operations as well as imported ones. Some goods are, nevertheless, considered to be basic necessities (i.e., food items) and are not taxed.<sup>7</sup>

**Tax 5:** Selective consumption tax (Impuesto Selectivo al Consumo): an indirect tax on goods and services that generate negative externalities to the individual and social order, or the environment; for example: cigarettes, fuel, etc. The tax base (value vs amount) and rate depends on the good or service.

**Tax 5:** Tariffs (Impuesto por importaciones): a tax on the cost, insurance, and freight import value (CIF) value of imports for all goods that enter the country. The rates are between 0–11 per cent.

**Tax 6:** Financial transactions tax (Impuesto a las transacciones financieras): created in 2003, it taxes financial transactions on the total amount. The original tax rate was 0.10 per cent of the total amount of the given transaction in 2004, but since 2011 the tax rate has been 0.005 per cent.

**Tax 7:** Temporal net assets tax (Impuesto temporal a los activos netos): is a tax levied on net assets of a company. The tax applies to firms who belong to the general income tax regime, and whose net assets value exceeds S/1 million. The tax rate is 0.4 per cent to value of net assets, in excess S/1 million.

**Tax 8:** Mining tax (Impuesto a la minería): an additional tax on profits of mining companies created in 2011. The tax is calculated from the operating profit of the company with rates varying between 2.0–8.4 per cent, depending on the operating margin.

#### 1.4.2 Sub-national taxes

**Tax 9—**Property tax (Impuesto predial): This tax is administered by the district municipalities. In Peru, there are 196 provincial municipality, each with it owns district municipality, so there may be the same number of methodologies for the payment of this tax. The calculation of the payment of the tax is based on a progressive accumulative scale according of the value of the property. However, some agents are unaffected to the property tax like foreign governments, Non-profit organizations, religious organizations, farmers communities, etc.

**Tax 10:** Recreational boats tax (Impuesto a las embarcaciones de recreo) this is administered by the district municipalities, and levied on the ownership of recreational boats and similar craft that are required to register with the Port Captaincies. The calculation of the payment is five per cent of the original value of the acquisition.

**Tax 11:** Games of chance tax (Impuesto a los Juegos de Azar): for bingo or raffles, this tax is administered by the district municipalities. For lotteries, this tax is administrated by the provincial municipality. Taxes the performance of activities related to games, such as lotteries, bingo and raffles, as well as prizes in games of chance. The taxpayer is the company or institution that performs the taxable activities, as well as those who obtain the prizes.

**Tax 12:** Tax on non-sports public events (Impuesto a los espectáculos públicos no deportivos): this tax is administered by the district municipalities. The tax on non-sports public events is levied on the amount paid for admission to non-sports public shows in closed venues and parks, except for live theater shows,

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<sup>7</sup> Of this 18%, 2 percentage points go to municipalities through government transfers. The remaining 16% goes to the central government.

zarzuela, classical music concerts, opera, operetta, ballet, circus and national folklore, classified as public cultural shows by the National Institute of Culture.

**Tax 13:** Alcabala Tax (Impuesto de alcabala): this tax is administered by the district municipalities, and is applied to the purchase or transfer of real estate. Payment is the responsibility of the buyer of the property and must be in cash without altering the payment that has been agreed for the purchase of the property.

**Tax 14:** Taxes income tax for real estate transfer (Impuesto a la renta por transferencia de inmuebles – second category): The tax applies to the increase in value of the property being transferred. The tax rate is five per cent of the increased in value of the property, for the first two properties a single individual sells in one year. From the third sale onwards, the individual is considered a habitual seller and the income obtained (from the sale) will be categorized as ‘third category’, in which case the person pays a 29.5 per cent rate.

**Tax 15:** Motor vehicle tax (Impuesto Vehicular): is tax applied to the ownership of automobiles, vans, station wagons, trucks, buses and omnibuses that are no more than three years old from their first registration in the Peruvian Vehicle Ownership Registry. The annual payment is made in January for up to three years. The amount paid is one per cent of the original value of the acquisition of the vehicle.

## 2 Simulation of taxes and benefits in PERUMOD

### 2.1 Scope of simulation

Table 2.1 and table 2.2 present, respectively, the tax and benefit components included in the model. Both tables differentiate between components that are: excluded, included in the model but not simulated, and those that are simulated in PERUMOD. It also explains the reasons why simulation was not feasible.

**Table 2.1: Simulation of taxes and social contributions in PERUMOD**

	Variable name(s)	Treatment in PERUMOD 2019–22	Why not fully simulated?
Personal income tax	tin_s	S	
Selective consumption tax	tsc_s	E	No data on contribution records
External sector taxes and tariffs	test_s	E	No data on contribution records
Financial transactions tax	tft_s	E	No data on contribution records
Temporal net assets tax	ttna_s	E	No data on contribution records
Mineral taxes	tmin_s	E	No data on contribution records
Social insurance contributions self-employed health	tscse_s	S	
Social insurance contributions of employers health	tscer_s	S	
VAT (ITA and ICE)	Tva_s	S	

Notes: ‘-’ policy did not exist in that year; ‘E’ policy is excluded from the model as it is neither included in the microdata nor simulated; ‘I’ policy is included in the microdata but not simulated; ‘PS’ policy is partially simulated as some of its relevant rules are not simulated; ‘S’ policy is simulated although some minor or very specific rules may not be simulated.

Source: authors’ compilation.

**Table 2.2: Simulation of benefits in PERUMOD**

	Variable name(s)	Treatment in PERUMOD 2019–2022	Why not fully simulated?
Old-age pension	poa	I	No data on contribution records
Invalidity pension	pdi	I	No data on contribution records
Survivors' pension	psu	I	No data on contribution records
Social assistance child cct (juntos)	bsa_s	S	
Social assistance subsidised pension (Pension 65)	bsaoa_s	S	

Notes: '-' policy did not exist in that year; 'E' policy is excluded from the model as it is neither included in the microdata nor simulated; 'I' policy is included in the microdata but not simulated; 'PS' policy is partially simulated as some of its relevant rules are not simulated; 'S' policy is simulated although some minor or very specific rules may not be simulated.

Source: authors' compilation.

## 2.2 Order of simulation and interdependencies

Table 2.3 shows the order in which the policies in PERUMOD are simulated. Social insurance contributions are simulated first as they are deducted from taxable income in the simulation of personal income tax. Benefits are then calculated and lastly income taxes.

**Table 2.3: PERUMOD Spine: order of simulation**

Policy	PE_2019	PE_2020	PE_2021	PE_2022	Description of the instrument and main output
uprate_pe	on	on	on	on	DEF: Uprating factor
constdef_pe	on	on	on	on	DEF: Constants
ildef_std_pe	on	on	on	on	DEF: Standard income lists
ildef_non_std_pe	on	on	on	on	DEF: Model specific income lists
ildef_stats_pe	on	on	on	on	DEF: Stats presenter income lists
ildef_exp_pe	on	on	on	on	DEF: Expenditure income lists (Coicop)
tundef_pe	on	on	on	on	DEF: Assessment units
yem_pe	off	off	off	off	DEF: Minimum wage
neg_pe	on	on	on	on	INC: Recode negative incomes to zero
ses_pe	on	on	on	on	INC: Equivalence scales
spl_pe	on	on	on	on	INC: Poverty lines
tscee_pe	on	on	on	on	SIC: Social insurance contributions employee pension
tscse_pe	on	on	on	on	SIC: Social insurance contributions self-employed health
tscer_pe	on	on	on	on	SIC: Social insurance contributions of employers health
tin_pe	on	on	on	on	TAX: Income tax
tva_pe	on	on	on	on	TAX: Value-added tax
tex_pe	on	on	on	on	TAX: Selective consumption tax
bsa_oa_pe	on	on	on	on	BEN: Social assistance old age
bsa_pe	on	on	on	on	BEN: Social assistance conditional cash transfer
bsa00_pe	n/a	on	n/a	n/a	BEN: Bono me quedo en casa
bsa01_pe	n/a	on	n/a	n/a	BEN: Bono Independiente
bsa02_pe	n/a	on	n/a	n/a	BEN: Bono Rural
bsa03_pe	n/a	on	n/a	n/a	BEN: Bono Universal
bsa04_pe	n/a	n/a	on	n/a	BEN: Bono Yanapay (2021)
xhadj_pe	on	on	on	on	INC: Adjust consumption to new disposable income
output_std_pe	on	on	on	on	DEF: Standard output individual level
output_std_hh_pe	off	off	off	off	DEF: Standard output household level

Source: authors' compilation.

## 2.3 Policy switches

There were no structural changes in the tax–benefit system in Peru between 2019 and 2021. Parameter changes during these years are explained in detail in the following sections for the tax–benefit instruments simulated in the model.

By default, PERUMOD uses the national poverty line to calculate headcount poverty rates. The model also contains an extension switch ('POV'), which allows the user to employ the extreme poverty line for model simulations instead of the standard line.

## 2.4 Social benefits

### 2.4.1 Juntos (bsa\_pe)

**Definitions:** Juntos is a conditional cash programme (CCT) designed to alleviate poverty; in the short run through a monetary incentive, and in the long run through better health and increased human capital for children. The programme has two components: health and educational.

**Eligibility conditions:** Juntos eligible households must be financially vulnerable (identified by the Household Focalization System) and have at least: a pregnant woman, or a child, or teen younger than 19 years.<sup>8</sup>

**Income test:** The Household Focalization System (SISFOH) classifies, through an index, the social economic status of a household. The index is based on a series of variables related to characteristics such as Health, Education, Dwelling, Individual Vulnerability and Contextual Vulnerability. To be eligible, a household social economic category must be classified as: 'poverty' or 'extreme poverty'.

**Conditionality:** As mentioned above, the programme has two components: health and educational. The health component requires children of beneficiary households to assist in all relevant medical checks related to their growth. Likewise, pregnant woman must assist in their pre-natal controls. The education component requires all children, of beneficiary households, to attend primary or secondary education. They must attend at least 80 per cent of classes, and not lose two academic years or more. These criteria try to reduce absence of children in primary and secondary levels, and increase household spending in children's nutrition.

**Benefit amount:** The benefit amount is S/100 per month to beneficiary families. Every four years the programme evaluates recipients and if they are no longer in poverty the benefit is removed. There is an extra incentive for the students that live in VRAEM (River Apurimac, Ene and Mantaro Valley). It consists of S/300 for students that successfully finish the school year and S/200 extra for those that are part of the upper third.

**PERUMOD notes:** We simulate the benefit as a monthly payment. VRAEM students' component is not simulated because there is no data on contribution records.

### 2.4.2 Pension 65 (bsaoa\_pe)

**Definition:** Pension 65 is a state subsidised non-contributory pension programme, aiming to provide basic living conditions for the elderly. It officially started on 1 January 2012, with 193,774 beneficiaries. By December 2019 it had 544,202. However, the programme is considered not yet universal as a share

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<sup>8</sup> In 2023, the eligibility conditions changed to exclude families with children older than 14 years old.

of the population do not have a national identification document (Documento Nacional de Identidad, DNI), and another share are not registered within the SISFOH.

**Eligibility conditions:** Beneficiaries are people of 65 years or more, with a socioeconomic class identified as extreme poverty according to the SISFOH.

**Income test:** The Household Focalization System (SISFOH) classifies, through an index, the social economic status of a household. The index is based on a series of variables related to characteristics such as Health, Education, Dwelling, Individual Vulnerability and Contextual Vulnerability. To be eligible for Pension 65, a household socioeconomic category must be classified as 'extreme poverty', which means that the beneficiaries' income cannot afford the basic food basket.

**Benefit amount:** It consists of an assignment of a monthly value of around S/250 payable every two months to a specific individual.

## 2.5 Social contributions

Social insurance contributions in Peru depend mostly on worker status: employed or self-employed. Employed workers must contribute to the health system (although the employer pays) and to a retirement pension fund, either to the state-owned system or the private association fund. It is also possible to contribute to the health system independently in order to receive health services.

**Liability to contributions:** It should be noted that, in practice, a large share of workers does not pay SIC at all as many are informal workers. In our model, employee income (yem) and self-employment income (yse) are divided into these two categories to account for SIC evasion. For formal income, the ending 're' (registered) is used (yemre and ysere), while for informal incomes the ending 'nr' (not registered) is used (yemnre and ysenr). Employers are liable to pay SIC for their employees/dependents. Employees are, on the other hand, liable to pay into to the state-owned system (ONP) or the private pension system (AFP). Lastly there are voluntary contributions of non-working people, that we define as 'others' in the model.

### 2.5.1 Health Contribution (twl)

Mandatory for salaried and dependent workers.

**Employers:** For dependent workers, contributions are the responsibility of the employer. The employer must pay nine per cent of each employee wage. In the case of micro enterprises, the employer is responsible for 50 per cent of the contribution and the worker the other 50 per cent.<sup>9</sup>

### 2.5.2 Pension Contribution (poa)

Salaried and dependent workers must pay 10 per cent of labour income if the worker belongs to the private pension system (AFP); or 13 per cent of labour income if the worker belongs to the public pension system (ONP).<sup>10</sup> The amount is taken directly for their monthly salaries. Additionally, in the case of the private pension system, workers can make voluntary extra payments to contribute to their own private fund.

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<sup>9</sup> In the special case of pensioners formerly affiliated to the Fisherman's Social Security and Benefit Fund, the contribution is equivalent to 4% of the monthly pension accrued, and it is paid by the pensioner.

<sup>10</sup> However, a particular private pension firm may charge insurance and administrative fees of about 3.5%.

## 2.6 Personal income tax (tin\_s)

The Peruvian income tax system is divided in three large groups: capital income, business income and labour income. The tax categories are related with the groups.

For instance, the first and second tax categories relate with the capital income. The first category includes taxes to leases, sub-leases and transfer of assets, while the second category taxes other capital income (not included in the first category). The third category taxes business net income. It is corporate profit tax. The fourth and fifth category are related with labour income.

Fourth category income is obtained by any profession, trade or activities not expressly included in the third category, and by the performance of: functions of directors of companies, functions of municipal or regional council members for which per diems are received. People must declare their income through receipts for physical or electronic fees and must pay monthly, as a tax payment, a fee of eight per cent on the monthly gross income.

Lastly, fifth category income is obtained as compensation for personal work provided in a dependency relationship, including public office, whether elective or not. In addition, it includes annuities and pensions that have their origin in personal work, worker shares, income from work cooperatives (received by members).

Natural (or legal) persons (and public or private entities) that have employees must withhold a monthly amount of the remuneration paid to such employees (to ensure payment of their fifth-category income tax). Specifically, one-twelfth of the tax employees are due to pay on their total taxable income projected for the year.

**Table 2.4: Classification of income tax**

	Category	Rents
Capital Income	First category	Lease, sub-lease and transfer of assets.
	Second category	Other capital income not included in the first category.
Business Income	Third category	Commerce, industry, and other businesses considered by income tax law
Labour Income	Fourth category	Independent work.
	Fifth category	Of the work in relation to dependence and other income from independent work expressly indicated by the LIR.

Source: authors' compilation.

### 2.6.1 Tax unit

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

### 2.6.2 Taxable income

In what follows, we present the structure for the 2019 ordinary tax system.

To calculate the income tax, the starting point is the gross income of the fourth category. This income is deducted by 20 per cent of the total (gross income of the fourth category), up to a limit of 24 tax units (UITs). After that, the net fourth category income and the fifth income are summed. Then, a fixed amount of seven UITs are deducted of this new broader income concept. This seven UIT deduction is applied even if the taxpayers only receive self-employed (fourth-category) or employed (fifth-category) income.

Lastly, before the application of a progressive tax rate, personal expenditure deductions should be deducted. These expenditures must have been declared to the government as income of other agents.

**Table 2.5: Calculation of net taxable income**

Gross income		Deductions		Net taxable income
Fourth-category	Exercise of a profession, art, science or another occupation that is done without having a dependency relationship. (receipts for fees)	(-) 20% of gross income Until the limit of 24 UIT	Special deduction (-)7UIT	Net Income of fourth and fifth category.
	Rents perceived for having worked as a business director, syndic, mandatary, executor or similar activities. Revenues of municipal or regional council diets	No deduction of 20%		
Fifth-category	Worker on payroll	No deduction of 20%		

Source: authors' compilation.

**Table 2.6: Taxable income, exemptions and deductions**

Category	Element	Description	Variables
Total Income	+employment income		yem
	+self-employment income		yse
	= taxable income	Sum of yem and yse	il_TaxableY
Deductions	- general deduction	Equal to 7 UIT	
	- personal expenditure deductions	Set of personal expenses - up to 3 UITs	i_ITDed1
	- self-employment deductions	20% of gross self-employment income until the limit of 24 UIT	i_ITDed2
	= preliminary tax base		i_IT_baseY
	= tax base		i_TaxbaseY

Source: authors' compilation.

**Definition of Income:** Total income is composed of labour earnings (employment and self-employment) pension income and incomes from investments (except dividends).

### 2.6.3 Personal Expenditure Tax deductions

Deductions for personal expenditures apply to expenditure in restaurants, bars, hotels, professional services, and housing. There are individual deductions for each type of expenditure. The list of personal expenditure deductions includes: 30 per cent of the expenditure on housing rent, 20 per cent of expenditure on hotels and restaurants, 30 per cent of expenditure in doctors and dentists, 100 per cent of expenditure on housekeeper health contributions, 25 per cent of expenditure on travel or tourist agencies, 50 per cent of expenditure on tourist guides, and 30 per cent of expenditure on services of independent workers. However, these deductions must have been formally declared to the government and have a limit of three UITs.<sup>11</sup>

Finally, these deductions only applied if a person's annual income is higher than seven UITs; that is, if the person has any taxable income after the fixed seven UIT deduction mentioned above.

### 2.6.4 Tax base

The tax base for income tax calculations is defined as total income minus exemptions, minus deductions. The tax base must be transformed to tax units for the purpose of calculating tax liabilities.

<sup>11</sup> This version of PERUMOD, only considers 30% of expenditure on housing rent as part of the possible personal expenditure to be deducted. We do not have sufficient information for the rest of expenditure, nor do we know if they were declared to the government. We assume housing rent expenditure is declared by household owner.



## 2.6.5 Tax schedule

The tax schedule was modified as part of the reforms introduced in 2015. As a result of the tax reforms, since 2015, the tax schedule has been more progressive, with five tax bands and rates between 5 and 30 per cent. Table 2.5 presents the tax schedule for the years 2019–21.

**Table 2.7: Personal income tax schedule, 2019–21**

Tax rate, %	2019	2020	2021
8	0-21,000	0-21,500	0-22,000
14	21,000-84,000	21,500-86,000	22,000-88,000
17	84,000-147,000	86,000-150,500	88,000-154,000
20	147,000-189,000	150,500-193,500	154,000-198,000
30	189,000+	193,500+	198,000+

Source: authors' compilation.

## 2.7 Indirect taxes

### 2.7.1 Value-added tax (VAT)

IGV is an indirect tax on sales for most goods and services of the economy and is applied to national transactions as well as imports. Under the value-added system, goods can be categorized as belonging to three types: 'taxed', 'exempt', and 'excluded'. Since 2012 there are three different rates for each of these categories: zero per cent for exempt and excluded goods, five per cent reduced rate for specific goods, and a general rate of 18 percent (since 2016, Act 1819 of 2016).<sup>12</sup> Excluded items mainly consist of non-processed food and essential services such as health and education.

### 2.7.2 Excise tax/selective consumption tax

The Impuesto Selectivo al Consumo (ISC) is an excise tax on goods and services that generate negative externalities to the society or the environment; for example: cigarettes, fuel, etc. Due to its nature, the ISC tax base (value vs amount) and rate vary on the nature of the good or service being taxed.

Hence, to simulate the ISC it is needed to know which particular product has been consumed to be able to apply the correct tax policy. However, the information from the survey does not contain this degree of consumption specificity. As a result, it is only simulated for alcohol and cigarettes where the tax rates are similar. For alcohol consumption, we assume a 23 per cent of tax rate over the original price (without the VAT) and for cigarettes consumption we assume a 1 per cent of tax rate over the original price. The variables simulated are *tex01\_s* for the alcohol tax and *tex02\_s* for the cigarettes tax. The total amount of ISC is simulated by the *tex\_s* variable.

## 3 Data

### 3.1 General description

For PERUMOD the Household Income Survey (Encuesta Nacional de Hogares, ENAHO) is used. ENAHO is a nationally representative cross-sectional survey of households in Peru. The survey aims to provide information of labour, income, and expenditures of Peruvian households as well as the demographic

<sup>12</sup> Of this 18%, 2 percentage points go to municipalities through government transfers. The remaining 16% goes to the central government.

and socioeconomic characteristics of the household members. ENAHO 2019 contains information for 34,565 households and 116,493 individuals, ENAHO 2020 contains information for 34,490 households and 115,777 individuals, and ENAHO 2021 contains information for 34,245 households and 109,867 individuals. PERUMOD v2.4 uses ENAHO 2019 and 2020.

ENAHO holds useful information for this project, such as main job income employment and self-employment income, contributions to social security and tax payments, social cash transfers, public pensions, income from capital and property, private transfers and remittances. Data on household expenditures is also available, as well as information on demographic and socioeconomic characteristics of each member of the household. Information about affiliation to different social security regimes is also reported.

**Table 3.1: PERUMOD database description, ENAHO 2019**

PERUMOD database	PE_2019_a1
Original name	ENAHO 2019
Provider	Instituto Nacional de Estadística e Informática, INEI
Year of collection	2019
Period of collection	1-2019/12-2019
Income reference period	Previous month
Sample size	34,565 households/116,493 individuals
Response rate	78.79%

Source: authors' compilation.

**Table 3.2: PERUMOD database description, ENAHO 2020**

PERUMOD database	PE_2020_a1
Original name	ENAHO 2020
Provider	Instituto Nacional de Estadística e Informática, INEI
Year of collection	2020
Period of collection	1-2020/12-2020
Income reference period	Previous month
Sample size	34,490 households / 115,777 individuals
Response rate	64.56%

Source: authors' compilation.

**Table 3.3: PERUMOD database description, ENAHO 2021**

PERUMOD database	PE_2021_a1
Original name	ENAHO 2021
Provider	Instituto Nacional de Estadística e Informática, INEI
Year of collection	2021
Period of collection	1-2021/12-2021
Income reference period	Previous month
Sample size	34,245 households / 109,867 individuals
Response rate	78.68

Source: authors' compilation.

## 3.2 Data adjustment

Adjustments to the data and variables are kept to a minimum. Two data adjustments are made for the simulations. First, individuals recorded as domestic employees in a household have been dropped, as information about their own household (e.g., number of children, expenditures) is not available. Second, all income and expenditure variables are nationally adjusted to reflect a national common cost of living.

### **3.3 Imputations and assumptions**

#### **3.3.1 Time period**

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

All monetary amounts in the ENAHO are expressed in monthly terms, as required for the PERUMOD database. In PERUMOD 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 ENAHO datasets contain information about gross monetary incomes.

#### **3.3.3 Disaggregation of harmonized variables**

The ENAHO dataset include a single variable covering different groups of household expenditure. The different groups are home spending, home maintenance, transport and communications, housing services, leisure, entertainment and culture services, personal care goods and services, clothing and footwear, furniture and fixtures, education expenditure and home equipment. Each group of household expenditure have the expenditure of the household of a specific item. To cover the 15 categories of expenditures we construct the variables using each item of the expenditure dataset.

#### **3.3.4 Labour market formality**

A variable to identify workers in formal employment (lim) was created in the data. Formal employment is defined based on two conditions relating to the labour market status of the worker. Self-employed workers are considered to be in formal employment if they have a public health insurance or private health insurance, meaning that they have work social security. Employees are considered to be in informal employment if they do not have public or private health insurance.

#### **3.3.5 Own produce in income lists**

In Peru, the National Statistics Institute considers own produce from self-employed activities (yse) as part of earnings, as is the case for in-kind benefits for employees. For urban workers the survey asks for monthly income received. For rural workers the net profit from the harvest or business for the last 12 months. For self-employed, net incomes is transformed to gross income (before taxes) by adding SIC and income tax as reported in the survey. In the model, we therefore consider own produce as part of earnings, which enters the concept of market income. The income lists of disposable income with and without own produce are therefore equivalent. However, the user can adapt the model and subtract own produce (yse and yem) from disposable income (yds) to assess the effect of excluding it from this concept.

#### **3.3.6 Imputation of expenditure data in ENAHO**

Expenditure data need to be imputed in ENAHO as part of the data work to generate PERUMOD's input data. Our approach to impute expenditure data in ENAHO draws closely on the method used by Akoguz

et al. (2020) to impute expenditure data in the EUROMOD input data for EU countries. The approach follows seven main steps, which we summarize below.

Step 1: We start from two output datasets produced by PERUMOD v2.3 based on one input dataset corresponding to a common policy year. The output is based on the PERUMOD input data generated from ENAHO. Monetary variables are updated to income and price levels of the policy year for which we want to perform the imputations using PERUMOD.

Step 2: We define broad categories of expenditure variables and convert them into shares of disposable income in the source dataset. In our case, we define 15 categories corresponding to the 15 COICOP income lists in PERUMOD. Aggregating expenditures under broad categories should reduce the infrequent expenditure problem. However, some households with zero expenditures might remain; they are considered as true zeros.

### **3.4 Updating**

PERUMOD is available for the years 2019–22.

### **3.5 Consumption levels**

Consumption levels are updated from the base year to the policy year and adjusted by absolute changes in disposable income from the base year to the policy year. The change in disposable income takes into account changes in market incomes and changes in benefits and social insurance contributions. The underlying assumption is that changes in disposable incomes lead to the same changes in consumption levels.

## **4 Validation**

### **4.1 Aggregate validation**

PERUMOD results have been validated against official benchmarks. A detailed comparison of the number of people employed, receiving a given income component, and total yearly amounts are shown in Annex A. Input data for market income, as well as simulated taxes and benefits are validated against external data. Discrepancies between PERUMOD results and external benchmarks are discussed in the following sub-sections.

#### **4.1.1 Validation of incomes input into the simulation**

Tables A1 in Annex A shows the number of employed and unemployed individuals in the dataset used for EUROMOD simulations against external benchmarks for the years 2019, 2020, and 2021. The PERUMOD database offers a good approximation for employment and unemployment for 2020 and 2021.

The discrepancy might be, to some extent, due to the fact that official estimates include unpaid work, whereas our statistics consider only people in paid work. Moreover, during 2020 many employees were offered the opportunity to be furlough/suspended from work until the pandemic crisis passed.

Tables A2 compares the number of income recipients of either employment or self-employment in PERUMOD's input databases, with the number of people reported by the Peruvian Statistics Institute. For 2019, our calculations are relatively comparable with external numbers. We seemed to only slightly underestimate the number of dependent workers, and overestimate the number of self-employed

workers. The accuracy of the comparability, however, changes for 2020 and 2021; where our calculations underestimate both figures. The year 2020 was an exceptional year. During the crisis the government offered the different options for employers to stop wage payment without actually laying off workers. That PERUMOD's estimates of employment come from self-reporting might explain part of the difference. Table A3 presents the aggregate amount of employment and self-employment income calculated in PERUMOD. Comparable external statistics, however, are not available to validate these results.

Similarly, Table A4 and A5 present the number of pension recipients and total income received (such as old-age pensions, and housing grants). As in the previous table we found no official statistics to properly compare it to.

#### **4.1.2 Validation of output (simulated) incomes**

Tables A6 and A7 present the number of recipients (and income received) of simulated benefits and payers of simulated taxes and contributions. Official benchmarks are, however, limited. From the Peruvian revenue agency, we find numbers of the total social assistance beneficiaries and total labor income collected in one year.

Table A6 shows our simulations of social assistance and old-age assistance beneficiaries; that is beneficiaries of the social programme 'JUNTOS' and 'Pension65'. Similar to our results in Table A1 (and, to some extent, Table A2) our calculations of number of beneficiaries are relatively comparable to official numbers. Slightly below the official number but overall accurate. Nevertheless, we have not found official information regarding other beneficiaries or taxpayers, such as, disability beneficiaries or number of labor income taxpayers.

Table A7 present figures related to aggregate annual expenditure in social benefits and revenue from taxes and SICs. The official recovered information is still limited. There is information regarding payment of labor income taxes and VAT. Our simulations clearly underestimate labour income tax, by a gap of 66–84 per cent, from official figures. It is worth mentioning that the gap is larger in 2020 and 2021, where the pandemic crisis generated a recession.

Table A7 also simulates revenue collected from VAT. Again, PERUMOD figures underestimate the amount collected in taxes. Our figures are around 50–60 per cent lower than the official numbers. Though the ENAHO is a survey design to recover information regarding living conditions of Peruvian households, questions regarding tax payment may suffer from self-reported bias. Unfortunately, we have not found official information for other taxes and contributions.

## **4.2 Income distribution**

The results presented in this section focus on 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. For 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 individuals aged 14 years and above = 0.5, and additional individuals aged below 14 years = 0.3.

However, the Peruvian Statistics Institute calculates poverty comparing the household per capita expenditure to predetermined expenditure lines that change according to the region and density of the locality. As such, the comparison of the poverty results needs to be treated with care. The variable used in PERUMOD (and calculations from it) and the one used by the Peruvian Statistics Institute are not comparable.

## 4.2.1 Poverty rates

Table A8 presents statistics on poverty and extreme poverty in Peru, derived using PERUMOD simulations and those published by Peruvian Statistics Institute annually. It shows that, compared with annual official poverty estimates, PERUMOD results overestimates poverty. For example, for 2019 PERUMOD results show about a 45 per cent higher poverty levels. The results are less divergent for urban areas, but still show higher numbers than the officially calculated. From 2020 onwards, however, the divergence increases. Although, figures move in the same directions, pointing an increase in poverty levels, the change is more pronounced in PERUMOD estimates.

This divergence is explained by the particulars of 2020 and the different variables use. During 2020, Peru experienced a significant increase in unemployment, and a reduction in income. As mentioned above, while PERUMOD figures uses income to identify poverty, official estimates use household expenditure. As expenditure is less volatile than income during a crisis, the poverty rates calculated through income might be higher.

## 4.3 Statistics presenter

A series of variables and income lists were created in PERUMOD for the use of the Statistics Presenter tool in the EUROMOD platform. These variables are created following the SOUTHMOD Modelling Conventions. This section describes the elements implemented in the model for the use of the tool.

Two constants were created in the model to define the values of the poverty line ( $\$Povline$ ) and extreme poverty line ( $\$ExtPovline$ ) in Peru. These constants relate to the values used by the Peruvian Statistics Institute.

The following income lists were 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*: social security contributions by employees, self-employed, and employers
- *ils\_bch*: child-related benefits—this income list is empty in PERUMOD as there are no specific child-related benefits in Peru
- *ils\_bsa*: social assistance-related benefits, containing the conditional cash transfer JUNTOS, old age pension for poor elder people, and the transfers made because of the pandemic crisis during 2020 (Bono me quedo en casa, Bono independiente, Bono Rural, Bono Universal)
- *ils\_bsu*: orphan and widowhood-related benefits—this income list is empty in PERUMOD as there are no specific transfers for orphans and widows in Peru
- *ils\_bdi*: disability-related benefits—empty in PERUMOD
- *ils\_bun*: unemployment-related benefits, containing severance payment—this income list is empty in PERUMOD as there are no unemployment benefits in Peru
- *ils\_bag*: agricultural benefits—empty in PERUMOD
- *ils\_dispyx*: disposable income with imputed values for own produce (food and non-food)—in PERUMOD, as mentioned above, this income list is identical to *ils\_dispy*
- *ils\_dispyx\_pf*: post-fiscal income taking account of own produce, defined as disposable income accounting for own produce (*ils\_dispyx*) minus indirect taxes (*ils\_taxind*)
- *ils\_con*: simulated consumption (*xhh\_s*), defined as household expenditure as recorded in the data (*xhh*), uprated from the base year to the policy year and adjusted by absolute changes in disposable income from the base year to the policy year, and

- *ils\_con\_pf*: post-fiscal simulated consumption, defined as simulated consumption (*ils\_con*) minus simulated indirect taxes (*ils\_taxind*).

#### 4.4 Summary of 'health warnings'

There are some considerations to be kept in mind when using the ENAHO survey to simulate the (gross and net) income, poverty and inequality patterns of the Peruvian economy.

There is under-representation of high-income workers in the ENAHO survey, which is likely to result in an underestimation of personal income tax and SICs. Likewise, given that the Peruvian economy is highly informal and that information on indirect tax payments is based on self-assessment, our estimations also likely underestimate indirect taxes.

The comparison of poverty and inequality results should be regarded with care when the ENAHO input data is used for simulations of policy years 2019–22. Although the ENAHO is used to officially calculate poverty, the official calculations use overall expenditure concepts, whereas PERUMOD uses income concepts. The Peruvian statistic institute inequality estimates did use income as their base variable, however, they have stop publishing them in the last years. As a result, there are no official numbers on inequality to compare our estimates to.

The policy systems provided in PERUMOD v2.4 reflect policies as they were in place as of 1<sup>st</sup> June of that specific year, providing a 'snapshot' of the tax-benefit system at this date for each policy year simulated. Nevertheless, we use the complete annual data set of the ENAHO for our simulations.

COVID-related policies are paid once by the government with a specific range of day for the payment. Hence, these benefits are implemented using a month-to-year payment adjustment. This means that the transfer amounts are divided by 12 months (i.e.,  $S/760 \div 12$ ). Therefore, the monthly payment simulated is not exactly the one given by the government.

Starting in 2020, laws changed to allow people to take out their private unemployment fund (compensation of length of service, CTS) and their private retirement fund (AFP).<sup>13</sup> However, we do not have information on who precisely decided to withdraw from their funds and what amount. As a result, these exceptional policies were not simulated.

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<sup>13</sup> For the retirement fund, there was a maximum allowed to be withdrawal.

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## Annex

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

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Number of employed	15,084	12,488	12,488	12,488	17,133	14,902	17,120	n/a	0.88	0.838	0.729	n/a
Number of unemployed	470	1055	1055	1055	697	1,193	1,029	n/a	0.675	0.884	1.025	n/a

Source: Peruvian Ministry of Job and Employment Promotion (MTPE) and National Institute of Statistics and Informatics (INEI).

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

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Employment Income	7,894	6,170	6,170	6,170	9,029	7,168	8,663	n/a	0.874	0.861	0.712	n/a
Self-employment income	8,921	7,100	7,100	7,100	8,104	7,734	8,457	n/a	1.101	0.918	0.839	n/a

Source: Peruvian Ministry of Job and Employment Promotion (MTPE)

**Table A3: Market income in EUROMOD: annual amounts (in millions)**

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Employment Income	156,737	119,727	129,752	132,508	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Self-employment income	98,502	63,817	69,162	70,631	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: no official data found.

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

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Old age pensions	909	851	851	851	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Disability pensions	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Survivor's pensions	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Housing grant	950	674	674	674	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: no official data found.

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

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Old age pensions	10345	8963	8963	9878	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Disability pensions	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Survivor's pensions	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Housing grant	1289	1257	1257	1385	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: no official data found.

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

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
<b>Benefits</b>												
Social assistance benefits	685	678	678	678	660	698	692	722	1.04	0.97	0.98	0.94
Old age social assistance benefits	519	503	503	503	557	557	557	602	0.93	0.9	0.9	0.84
BSA: Bono me quedo en casa	n/a	2,478	n/a	n/a	n/a	2,588	n/a	n/a	n/a	0.96	n/a	n/a
BSA: Bono Independiente	n/a	814	n/a	n/a	n/a	773	n/a	n/a	n/a	1.05	n/a	n/a
BSA: Bono Rural	n/a	788	n/a	n/a	n/a	804	n/a	n/a	n/a	0.98	n/a	n/a
BSA: Bono Universal	n/a	1,311	n/a	n/a	n/a	985	n/a	n/a	n/a	1.33	n/a	n/a
BSA: Bono Yanapay	n/a	n/a	8852	n/a	n/a	n/a	13,584	n/a	n/a	n/a	0.65	n/a
Disability carer benefit	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Taxes and social insurance contributions (SICs)</b>												
Income tax	1,429	1,004	1,084	645	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Employee SIC	1,123	1,058	1,058	1,058	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Armed forces and police SIC	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	1,112	7,22	722	722	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Employers SIC	3,652	2,878	2,878	2,878	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Government SIC for armed forces and police	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: Peruvian Ministry of Development and Social Inclusion (MIDIS).

**Table A7: Tax–benefit instruments simulated in EUROMOD: annual amounts (in millions)**

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
<b>Benefits</b>												
Social assistance benefits	822	814	814	814	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Old age social assistance benefits	778	754	754	754	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSA: Bono me quedo en casa	n/a	942	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSA: Bono Independiente	n/a	619	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSA: Bono Rural	n/a	599	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSA: Bono Universal	n/a	996	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BSA: Bono Yanapay	n/a	n/a	3,098	n/a	n/a	n/a	5,145	n/a	n/a	n/a	0.6	n/a
Disability carer benefit	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Taxes and social insurance contributions (SICs)</b>												
Income tax	3,614	2,562	3,012	2,977	10783	10180	11565	n/a	0.335	0.252	0.26	n/a
Employee SIC	3,555	3,295	3,571	3,647	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Armed forces and police SIC	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	2,183	1,424	1,424	1,424	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Employers SIC	9,563	7,383	7,985	8,170	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Government SIC for armed forces and police	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	19,935	16,915	16,915	16,915	37,892	32,708	42,608	n/a	0.526	0.517	0.397	n/a
ICE alcohol	32.94	28.59	28.59	28.59	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ICE cigarettes	19.4	12.25	12.25	12.25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Source: Central Bank of Peru (BCRP) and Peruvian Ministry of Development and Social Inclusion (MIDIS).

**Table A8: Absolute poverty rates and income inequality**

	PERUMOD				External				Ratio			
	2019	2020	2021	2022	2019	2020	2021	2022	2019	2020	2021	2022
Poverty <sup>14</sup>												
Total	29.43	47.54	47.08	46.28	20.2	30.1	25.9	n/a	1.457	1.579	1.818	n/a
Urban	19.55	39.76	38.94	37.72	13.6	23.1	22.3	n/a	0	1.721	1.746	n/a
Rural	71.06	78.85	79.21	78.73	31	32	39.7	n/a	2.292	2.464	1.995	n/a
Extreme poverty												
Total	13.96	27.55	27.91	27.39	2.9	5.1	4.1	n/a	4.813	5.401	6.807	n/a
Urban	6.5	20.6	20.36	19.54	1	2.9	2.1	n/a	6.5	7.105	9.694	n/a
Rural	45.95	56.54	59.14	58.98	9.8	13.7	12.1	n/a	4.689	4.127	4.887	n/a
Inequality												
Gini	46.76	53.49	53.69	54.58	41.6	43.8	n/a	n/a	1.12	1.22	n/a	n/a

Source: National Institute of Statistics and Informatics (INEI).

<sup>14</sup> In Peru, the poverty rate is calculated using the household per capita expenditure, not the income as most other SOUTHMOD models do.