

SOUTHMOD

Country report

Tanzania

TAZMOD v2.5

2012, 2015–20

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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 Centre for Microsimulation and Policy Analysis ([CeMPA](#)) 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), South Africa (SAMOD), Tanzania (TAZMOD), Uganda (UGAMOD), Viet Nam (VNMOD), and Zambia (MicroZAMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents TAZMOD, the SOUTHMOD model developed for Tanzania. This work was carried out by [University of Dar es Salaam](#) in collaboration with the project partners.

The results presented in this report are derived using TAZMOD version 2.5 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 TAZMOD results against external data sources. For further information on access to TAZMOD and other SOUTHMOD models, see the [SOUTHMOD page](#).

The TAZMOD 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’. For more information, see the [SOUTHMOD project page](#).

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Acronyms

CPI	Consumer price index
HBS	Household Budget Survey
LFS	Labour Force Survey
LGA	Local Government Authority
LMA	Law of Marriage Act
MoFP	Ministry of Finance and Planning
NBS	National Bureau of Statistics
NHIF	National Health Insurance Fund
NSSF	National Social Security Fund
PAYE	Pay-as-you-earn
PMT	Proxy means test
PSSSF	Public Service Social Security Fund
PSSN	Productive Social Safety Net
PSU	Primary sampling unit
TASAF	Tanzania Social Action Fund
TMU	TASAF monitoring unit
TRA	Tanzania Revenue Authority
TZS	Tanzanian shillings
URB	Unified Registry of Beneficiaries
VAT	Value-added tax

1 Basic information

1.1 Basic information about the tax-benefit system

The United Republic of Tanzania is a member of both the Southern African Development Community (SADC) and the East African Community (EAC).

The working age in Tanzania is 18 years and above; work below that age is referred to as child labour. Primary education is free and compulsory for all children from seven years of age, and primary education lasts for a period of seven years. The minimum school leaving age in Tanzania is 14 years. Dependent children are defined as those aged below 18 years.

The Public Service Retirement Benefits Act 1999 defines the voluntary retirement age as 55 years and statutory retirement age as 60 years. An exception was enacted in 2018, whereby the statutory retirement age for professors, senior lecturers, and medical specialists was changed to 65 years.

In terms of family structure, polygamy is fairly widespread in Tanzania, with origins in Customary Law and Islamic Law traditions. The 1971 Law of Marriage Act (LMA) allows men to have more than one wife (but not for women to have more than one husband) and was written with the intention of accommodating both Customary Law and Islamic Law traditions (Howland and Koenen, n.d.). Importantly, the Act states that each wife shall enjoy equal rights and have equal status in law. However, where informal de facto variants of polygamy occur, the 'unofficial co-wives have limited social recognition and little protection under the LMA' (Howland and Koenen, n.d.: 27).

Lone parenthood is not very prevalent but is on the rise. Tanzania's Local Customary Law (Declaration) Order of 1963 states that children of married couples belong to the father, and this custodianship continues beyond divorce. The only exception is that divorced women are given temporary custodianship of children that they are breastfeeding. If a woman has an illegitimate child, the child is said to belong to the woman's father (see Government of Tanzania 1963: chapters 3 and 4).

In Tanzania, tax policies are divided between central and local government, although central government collects most of the tax revenue (see Leyaro et al. 2015). The Ministry of Finance and Planning (MoFP, formerly the Ministry of Finance and Economic Affairs) through the Tanzania Revenue Authority (TRA) is the custodian of the design, oversight, administration, and implementation of tax policies. The fiscal year runs from 1 July to 30 June, and amendments to taxes and other related financing policies are usually submitted by MoFP to Parliament at the start of the financial year through the Finance Bill. Upon approval of Parliament and signature by the president, the Finance Bill becomes the law known as the Finance Act. At the local government level, the Local Government Finance Act guides Local Government Authorities (LGAs) on sources of revenue and management of funds and resources. The municipal and district councils introduce the taxes using bylaws and although the rates may differ from one local government to another, they usually include property taxes, fees, and levies. Other fees, fines, and charges are collected by other ministries, departments, and agencies (MDAs) of the government other than MoFP, but they make an insignificant share of total revenue collections.

Tanzania has a progressive personal income tax schedule (the minimum rate is 9 per cent and the maximum is 30 per cent), which is applied at the level of the individual. There is no statutory indexing regime for taxes to take account of inflation in Tanzania. Taxpayers need to fill in a tax return; however, tax evasion and avoidance is still quite widespread.

In Tanzania, social security is a right for everyone. This right is contained in Article 11(1) of the Constitution of the United Republic of Tanzania and in the National Social Security Policy of 2003 (Ministry of Labour, Youth Development and Sports 2003). This right is also enshrined in the Universal Declaration of Human Rights of 1948 and International Labour Organization charters. Within Tanzania, there are mandatory and voluntary contributory schemes as well as non-contributory benefits (see below and Leyaro et al. 2015), and there are a number of developments underway (Ulriksen 2016).

Finally, TAZMOD has been produced for mainland Tanzania only, as Zanzibar has different tax and benefits arrangements and undertakes its own household surveys. Therefore, it may be optimal to develop a separate model for Zanzibar (i.e. ZANMOD). Efforts are underway to accomplish this (Leyaro et al. 2020).

1.2 Social benefits

The Tanzania Social Action Fund (TASAF) is responsible for implementing the Productive Social Safety Net (PSSN). The first phase of the PSSN programme ran from 2013 to 2019. Phase 2 of the PSSN commenced in 2020 and will be in place till 2023¹. According to the website:

Phase Two will achieve its objectives by implementing various activities through three main areas which are money transfer which will increase household income and invest in children's health and education, boost the household economy by building household capacity in resource management and creating alternatives and sustainable employment and participation in community work and earning extra income for household consumption such as food and financing other basic needs while at the same time improving infrastructure in the community and gaining life skills and skills.

The money transfer aspect of Phase 2 is similar to that in Phase 1, namely two cash transfers—a fixed basic cash transfer and a variable conditional cash transfer. In addition to the two cash transfers, there is the public works programme described in this section. The PSSN also has two other strands of provision: livelihoods enhancement and targeted infrastructure. The two cash transfers arose from a pilot community-based conditional cash transfer that ran between 2010 and 2013 in three districts (Bagamoyo, Chamwino, and Kibaha).

Benefit 1 (*Basic Social Assistance: PSSN, fixed basic cash transfer*): This is a cash transfer to low-income households.

Benefit 2 (*Basic Social Assistance—Conditional: PSSN, variable conditional cash transfer*): This is a top-up cash transfer to low-income households with children, conditional on compliance with requirements related to education and health behaviour. In Phase 2 it was extended to those with a disability.

1.2.1 Not strictly benefits

Not strictly benefit 1 (*Public works programme: PSSN, public works*): This is also a strand of the PSSN scheme. This programme is intended to link the beneficiaries to the labour market.

In Tanzania there are also other different programmes that are targeted to support specific vulnerable groups in the community. Some of these programmes include the National Agriculture Input Voucher Scheme (NAIVS) and the bed net programme. Most of them are donor-funded and are time limited due to resource constraints.

¹ In practice, because of the COVID-19 pandemic, the programme only began in the third quarter of 2020.

The NAIVS is part of the government intervention in supporting small-holder farmers engaged in the production of maize and rice. The programme started in 2008 as a response to the sharp rise in global grain and fertilizer prices and was enrolled in 65 districts. The programme aimed at subsidizing about 50 per cent of the agriculture inputs, particularly the purchased chemical fertilizers and improved seeds used by farmers, so as to enable them to realize profits from the harvesting (Johari 2018). The programme had several eligibility criteria and prioritized small-holder farmers cultivating one acre or below, first-time users of fertilizer, and female-headed households. It was designed to have a graduation period after three years, and thereafter beneficiaries had to begin to purchase inputs on commercial bases and also may join other programmes, such as the credit subsidies programme. However, due to several challenges such as non-graduation of beneficiaries, the scheme was banned and replaced by another programme, namely the Universal Bulk Input Procurement Subsidy programme (Johari 2018).

The bed net programme is the government's strategic programme to address malaria endemic disease by reducing the rate of mortality and morbidity in the country. It is a donor-funded programme started in 2004 through the distribution of insecticides-treated nets (ITNs) to pregnant women and mothers of infants. The programme was implemented through the Tanzania National Voucher System (TNVS) whereby beneficiaries received a voucher during the clinic visits for antenatal care and measles vaccination (Yukich et al. 2020). The vouchers can be submitted to participating retailers to receive nets at a subsidized or reduced price. The TNVS scheme ceased in 2014, and a new net distribution programme was introduced, augmenting the TNVS but using a new approach through schooling. The School Net Program (SNP) was introduced for children attending schools in selected primary and secondary grades. The ITNs are freely distributed to students. The programme has expanded to 14 regions and has already have six rounds of annual distribution (Yukich et al. 2020).

1.3 Social contributions

There are a large number of contributory schemes in Tanzania, some of which are compulsory and some are voluntary. However, coverage is minimal (covering only about 8 percent of the population) and the programmes are complex and fragmented. Partly because of these issues, the schemes were subsequently overseen by the Social Security Regulatory Authority (SSRA) (see Leyaro et al. 2015: 9–12 and Annex 5). In 2018, the Government of Tanzania took a decision to dissolve the SSRA and merged several pension funds (Parastatal Pension Fund, Public Service Pension Fund, Local Authority Pension Fund, Government Employees Provident Fund) to form a Public Service Social Security Fund (PSSSF) for public employees. As a result of the merger, Tanzania Mainland now has only two main pension funds: the National Social Security Fund (NSSF), and the PSSSF for public employees.

Supplementary schemes are voluntary and very flexible. For example, contributions can be made daily, weekly, monthly, or annually in the form of agricultural and livestock products such as eggs or tea.

Social contribution 1 (*Pension contributory scheme 1: NSSF*): This scheme was established by the National Social Security Fund Act 1998 with subsequent amendments and new provisions consolidated in the National Social Security Fund Act 2018 and is managed by the Board of Trustees of the National Social Security Fund. This scheme is mainly for formal workers in the private sector, employees of international organizations employed in Tanzania, and self-employed people. Under Section 21(1) of the act, the following benefits are payable:

- a retirement pension;
- b invalidity pension;
- c survivors pension;
- d funeral grants;
- e maternity benefit;
- f unemployment benefit; and
- g health insurance benefit.

Social contribution 2 (*Pension contributory scheme 2: PSSSF*): This mandatory scheme was established by the Public Service Social Security Fund Act of 2018 and is managed by the Board of Trustees of the Public Service Social Security Fund. PSSSF is for all public employees who were members of earlier schemes for public service employees as well as new public employees. Under Section 29(1) of the act, the following benefits are payable:

- a retirement benefit;
- b survivors benefit;
- c invalidity benefit;
- d maternity benefit;
- e unemployment benefit;
- f sickness benefit; and
- g death gratuity.

Social contribution 3 (*Health insurance contributory scheme 1: National Health Insurance Fund, NHIF*): This mandatory scheme was established in 1999 and the contribution rates are 3 per cent each for the employer and employee, respectively. The scheme is mandatory for government employees in non-pensionable positions but is also open to others.

Social contribution 4 (*Health insurance contributory scheme 2: Community Health Insurance Fund*): This scheme started in 1996 with a pilot scheme in Igunga District, which was later expanded to other councils with the expectation of covering the whole country (Ministry of Health 1999). The scheme was identified as a possible mechanism for granting access to basic health care services to populations in the rural areas and the informal sector in the country. As such, its primary aim was not to raise additional funds but to improve access to health care for the poor and vulnerable groups. The fund is a form of pre-payment scheme designed for rural people in Tanzania (Munishi 2001). It is based on the concept of risk sharing whereby members pay a small contribution on a regular basis to offset the risk of needing to pay a much larger amount in health care user fees if they fall sick. Membership to the scheme is voluntary and each household within a district contributes the same amount of membership fee, as agreed by members of the community themselves, and is given a health card (United Republic of Tanzania 2001).

1.4 Taxes

The Tanzania Revenue Authority (TRA) was formed in 1995 by Act of Parliament No. 111. In 2013/14, the main taxes (as a percentage of total tax revenue in mainland Tanzania) were pay-as-you-earn (PAYE) (16.5 per cent), corporation tax (15.0 per cent), domestic value-added tax (VAT) (13.3 per cent), and VAT on imports (13.5 per cent) (TRA 2014).

Tax 1 (*Presumptive income tax*) Presumptive tax is applied to resident individuals with businesses that have an annual turnover of less than TZS 100 million. Individuals with an annual turnover above this threshold pay personal income tax for individuals who prepare audited accounts and are taxed on their profits (see Tax 2). Individuals with an annual turnover of less than the presumptive tax threshold but who have other income, for example from salary employment, are also not eligible to pay presumptive tax and have to submit accounts (see also Tax 2).

Tax 2 (*Personal income tax: PAYE, and personal income tax for individuals, or tax for account cases*): Employers are required by law to deduct income tax from an employee's taxable salary via PAYE (for a definition of taxable salary income, see Leyaro et al. 2015: Annex 1). For PAYE, a withholding tax approach is used (for details about the withholding tax approach, see Leyaro et al. 2015: Annex 2). Individuals with an annual turnover above the presumptive tax threshold of TZS 100 million pay personal income tax for individuals who prepare audited accounts, and are taxed on their profits. Individuals with an annual turnover of less than the presumptive tax threshold but who have other

income, for example from salary employment, are also not eligible to pay presumptive tax and have to submit accounts.

Tax 3 (*Skills and development levy*): This is collected by TRA under the Vocational Education Training Act and is payable by an employer, with certain exceptions (see TRA 2020). This levy is calculated as 4.5 per cent of the emoluments paid to employees during the month.

Tax 4 (*Capital gains tax*): This tax is payable for the realization of interest in land or buildings, at 10 per cent for residents and 20 per cent for non-residents. It is also payable on net gains when investment assets are sold. For further details, see Leyaro et al. (2015: Annex 4).

Tax 5 (*Corporate income tax*): Corporation tax is a tax charged on the taxable incomes (profits) of entities such as limited companies and other organizations including trusts, clubs, cooperative societies, non-governmental associations, charitable organizations, domestic permanent establishment (branches of non-resident companies), political parties, government agencies, and other unincorporated bodies. It is payable at 30 per cent, both by residents and by non-residents (TRA n.d.).

Tax 6 (*Excise: Domestic and international trade*): Specific rates are charged on alcoholic and soft drinks, recorded music, cigarettes, tobacco, petrol, natural gas, and vehicles of different ages and engine sizes. Ad valorem rates vary from 10 to 50 per cent (TRA 2014).

Tax 7 (*VAT on supply of domestic goods and services and on imports of goods and services*): VAT registration is required when taxable turnover exceeds TZS 40 million per year, or turnover exceeds TZS 10 million over three consecutive months. The standard rate is 18 per cent (TRA 2014).

Tax 8 (*Import duties*): Semi-finished goods are taxed at 10 per cent, and finished consumer or commercial goods are taxed at 25 per cent. Raw materials, pharmaceuticals, capital goods, and agricultural tools are taxed at 0 per cent. Certain items are taxed above 25 per cent in order to protect local businesses (TRA 2014).

Tax 9 (*Other taxes and charges*): These include stamp duty, rental tax, withholding tax, gaming tax, tourism development levy, airport service charges, port charges, motor vehicle registration, motor vehicle transfer tax, motor vehicle driving license, fire inspection charge for motor vehicles, and export tax (for raw hides and skins and for raw cashew nuts) (TRA 2014).

2 Simulation of taxes and benefits in TAZMOD

2.1 Scope of simulation

Table 2.1 shows the benefit policies that are simulated in TAZMOD. Table 2.2 lists the main taxes and social contributions and specifies which are simulated within TAZMOD.

As Tanzania's financial year runs from 1 July to 30 June, it has been decided that TAZMOD's systems for each year should reflect the position as at 1 July in each year, rather than selecting a time point in June. So, for example, TAZMOD's 2015 system refers to the arrangements that were applicable from 1 July 2015.

Table 2.1 Simulation of benefits in TAZMOD

	Variable name	Treatment in TAZMOD							Why not fully simulated?
		2012	2015	2016	2017	2018	2019	2020	
Basic Social Assistance (bsa_tz)	Bsa_s	—	PS	PS	PS	PS	PS	PS	Community assessment of eligibility cannot be simulated.
Basic Social Assistance— Conditional (bchot_tz)	Bchot_s	—	PS	PS	PS	PS	PS	PS	Community assessment of eligibility and conditionalities cannot be simulated.
Basic Social Assistance— Conditional (bsa01_tz)	Bsa01_s	—	—	—	—	—	—	—	Community assessment of eligibility and conditionalities cannot be simulated.
Public works (bun_tz)	Bun_s	—	PS	PS	PS	PS	PS	PS	A flag is created for eligible households.

Notes: '—' policy did not exist in that year; '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 taxes and social contributions in TAZMOD

	Variable name	Treatment in TAZMOD							Why not fully simulated?
		2012	2015	2016	2017	2018	2019	2020	
Health insurance (tscehl_tz and tscerhl_tz)	tscehl_s tscerhl_s	E	PS	PS	PS	PS	PS	PS	NHIF is simulated but not CHIF
Presumptive tax (ttn_tz)	ttn_s	S	S	S	S	S	S	S	
Personal income tax (tin_tz)	tin_s	S	S	S	S	S	S	S	
Excise (tex_tz)	tex02_s tex03_s tex05_s	PS	PS	PS	PS	PS	PS	PS	Simulated for certain goods only
VAT (tva_tz)	tva_s	S	S	S	S	S	S	S	
Capital gains tax	n/a	E	E	E	E	E	E	E	No information available
Pensions contributions (tscee_tz and tscor_tz)	n/a	E	E	E	E	S	S	S	PSSSF and NSSF are simulated from 2018

Notes: NHIF, National Health Insurance Fund; CHIF, Community Health Insurance Fund; VAT, value-added tax; '—' policy did not exist in that year; 'E' policy is *excluded* from the model as it is neither included in the microdata nor 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 taxes and benefits are simulated in TAZMOD. The table is a reproduction of the policy spine from the model.

Table 2.3 TAZMOD Spine: order of simulation

Policy	2012	2015	2016	2017	2018	2019	2020	Description of the instrument and main output
uprate_tz	On	On	On	On	On	On	On	DEF: Uprating factors
lma_tz	Off	Off	Off	Off	Off	Off	On	DEF: Labour market adjustments due to COVID-19
neg_tz	On	On	On	On	On	On	On	DEF: Recode negative income to zero
ildef_tz	On	On	On	On	On	On	On	DEF: Standard income lists
ildef_non_std_tz	On	On	On	On	On	On	On	DEF: Model-specific income lists
ildef_stats_tz	On	On	On	On	On	On	On	DEF: Stats Presenter income lists
ildef_exp_tz	Off	Off	Off	Off	Off	Off	Off	DEF: Expenditure income lists (COICOP)
tundef_tz	On	On	On	On	On	On	On	DEF: Assessment units
constdef_tz	On	On	On	On	On	On	On	DEF: Constants
spl_tz	On	On	On	On	On	On	On	INC: Poverty lines
ses_tz	On	On	On	On	On	On	On	INC: Equivalence scales
tsceehll_tz	On	On	On	On	On	On	On	SIC: NHIF employee contribution
tscerhl_tz	Off	On	On	On	On	On	On	SIC: NHIF employer contribution
tscee_tz	Off	Off	Off	Off	On	On	On	SIC: Employee contributions to PSSSF and NSSF
tscer_tz	Off	Off	Off	Off	On	On	On	SIC: Employer contributions to PSSSF and NSSF
ttn_tz	On	On	On	On	On	On	On	TAX: Presumptive income tax
tn_tz	On	On	On	On	On	On	On	TAX: Personal income tax
bsa_tz	Off	On	On	On	On	On	On	BEN: PSSN Fixed basic cash transfer
Bsa_01_tz	Off	Off	Off	Off	Off	Off	Off	BEN: PSSN variable conditional cash transfer (2021 onwards)
bchot_tz	Off	On	On	On	On	On	On	BEN: PSSN variable conditional cash transfer (pre-2021)
bun_tz	Off	On	On	On	On	On	On	BEN: PSSN eligibility for public works
tva_tz	On	On	On	On	On	On	On	TAX: VAT
tex_tz	On	On	On	On	On	On	On	TAX: Excise duty and VAT on excise items
tva_tex_cbs_tz	Off	Off	Off	Off	Off	Off	Off	TAX: VAT and excise duty – constant budget shares
xhhdj_tz	On	On	On	On	On	On	On	INC: Adjust consumption to new disposable income
output_std_tz	On	On	On	On	On	On	On	DEF: Standard output individual level
output_std_hh_tz	Off	Off	Off	Off	Off	Off	Off	DEF: Standard output household level

Notes: DEF, definitional policy; INC, poverty policy; SIC, social insurance contribution policy; BEN, benefit policy; PSSN, productive social safety net. For information about the policies Spl_tz, Ses_tz, and Tva_tex_cbs_tz, see Section 2.3 on policy switches.

Source: Authors' compilation

Extensions (switches) are used in three policies within TAZMOD.

The first is in respect of the poverty policy (spl_tz). This policy provides for two poverty lines, each of which has two variants—a 'normal' variant and a post fiscal variant. The two poverty lines are the basic needs poverty line and the food poverty line. By default, the two variants of the basic needs poverty line are switched ON and the two variants of the food poverty line are switched OFF.

The second policy using extensions is the VAT policy (tva_tz). Because the tz_2018_a2 dataset utilizes a more extensive list of COICOP codes for its expenditure variables, there are two variants of the VAT income list il_exp_vat01. When running the model using the tz_2018_a7 dataset (which is appropriate for the 2018, 2019 and 2020 systems), the appropriate version of the income list il_exp_vat01 is switched ON, and the version of the income list il_exp_vat01 relevant to the tz_2012_a5 dataset is switched OFF. When running systems for 2012 and 2015 to 2017 inclusive using the tz_2012_a5 dataset, the VAT income list il_exp_vat01 relevant to this dataset is switched ON, whilst the income list il_exp_vat01 relevant to tz_2018_a7 is switched OFF.

By default, the VAT and Excise duty policies calculate indirect taxes on the basis of constant consumption. There is an additional policy, tva_tex_cbs_tz, which calculates indirect taxes on the basis of constant budget shares. By default, tva_tex_cbs_tz is switched OFF.

2.3 Social benefits

2.3.1 Basic social assistance (PSSN: fixed basic cash transfer) (bsa_tz)

Definitions

For the purposes of this benefit, a child is defined as aged 5–17 years inclusive, and an infant is defined as aged 0–4 years inclusive. This benefit is applied at the household level.

Eligibility conditions²

TASAF defines the eligibility conditions for this benefit as follows:

- Households with very low and unpredictable income compared with other households in the community.
- Households that cannot afford or cannot be certain that they can afford to have three meals per day.
- Households located in extremely poor environments/settlements. TASAF further elaborated that this criterion takes into account the number of rooms, windows, and bedrooms of the house; type of foundation of the house; construction material used for the house; and the type of floor, roof, and walls.

Identification of potential beneficiary households takes place after a Village Assembly has elected and formed a community team (or Community Management Committee). The community team is briefed about the targeting process, and the community team and LGA facilitators are then responsible for identifying potential beneficiary households using pre-determined criteria that have been agreed upon at the Village Assembly meeting. The pre-determined criteria are themselves based on a standard criterion that is reviewed and agreed upon by the Village Assembly. The standard criterion is that households should be below the food poverty line of TZS 26,085.50 per adult equivalent per month for the systems up to and including 2017 (NBS 2014b: 54); and below TZS 33,748 for the 2018 and 2019 systems (MoFP-PED and NBS 2019: 9).³

Once the community teams have produced a final list of households, Village Assembly meetings are convened to approve the list. Each community team has two members: one person with a good knowledge of households in the village so that they can help identify those most in need and one person with at least primary school education to administer paperwork used in targeting and enrolment activities. Once potential beneficiaries have been identified, key household data are collected which are then entered into the Unified Registry of Beneficiaries (URB) at the local government level. The TASAF monitoring unit (TMU) then applies the proxy means test (PMT) and each household that has been entered into the URB receives a welfare score. Households whose welfare score falls below the food poverty line are considered eligible for the programme (even if this means that the resulting beneficiary number for the district is above the target set by the resource allocation formula).

In addition to the basic transfer, targeted households with children are eligible for conditional transfer, and households with able-bodied people of working age are eligible for the public works programme. This matching exercise is automated using the URB. The TMU then provides the LGAs with lists of

² The details listed in this section (2.3.1 and 2.3.2) relate to PSSN Phase 1, which in practice ran until late 2020.

³ In practice, TASAF has raised this threshold slightly to capture approximately 14 per cent of the population, rather than the 10 per cent captured below the food poverty line, in recognition that those just above the line will be at risk (personal correspondence with TASAF).

households accepted and rejected by the PMT who, in turn, take these lists to the villages for a final round of community validation.

Income test

A PMT is applied (see above) in order to identify households that are likely to be below the food poverty line, which avoids the need to collect income or expenditure data at the point of application (Leite 2012). The PMT was derived using regression analysis of variables in the Household Budget Survey (HBS), with the dependent variable being those below the food poverty line.

Benefit amount and duration

The amount payable is TZS 10,000 per month per household that contains one or more adults, and TZS 4,000 per month per household that contains one or more children or infants. In practice, this benefit is paid every two months in order to reduce the costs of implementation.

In PSSN Phase 2 (from 2021 onwards), the amount payable is TZS 12,000 per month per household that contains one or more adults, and TZS 5,000 per month per household that contains one or more children or infants.

TAZMOD notes

It is not possible to simulate the initial ranking of villages that is undertaken in order to prioritize areas for support (Leite 2012).

It is also not possible to simulate the multi-stage decision-making roles of the Village Assembly and the community team.

It was not necessary to implement the PMT, as households below the food poverty line could be identified in the HBS, without the need to implement the PMT. Indeed, the PMT was derived using regression analysis of variables in the HBS, with the dependent variable being those below the food poverty line (Leite 2012).

2.3.2 Basic social assistance—Conditional (PSSN: variable conditional cash transfer) (bchot_tz)⁴

Definitions

For the purpose of this benefit, children are divided into four groups: pre-primary (aged 0–6 years inclusive), primary (aged 7–13 years inclusive, Standard I–VII), ordinary level secondary (aged 14–17 years inclusive, Form 1–4), and advanced secondary (aged 18–19 years inclusive, Forms 5 and 6). This benefit is applied at the household level.

Eligibility conditions

TASAF defines the eligibility conditions for this benefit as follows. The first three are the same as the non-conditional cash transfer described above:

- Households with very low and unpredictable income compared with other households in the community;
- Households that cannot afford or cannot be certain that they can afford to have three meals per day;
- Households located in extremely poor environments/settlements.

⁴ This policy was created afresh for 2021 and named bsa01_tz in TAZMOD as it contains an additional category relating to people with disability.

In addition, there are the following selection criteria:

- Household with school-age children (7–17 years inclusive) that cannot afford to register or enrol the children in school or where the children have dropped out of school because the household cannot afford to send them to school;
- Households with children (0–6 years inclusive) that do not attend the clinic to get health services/treatment;
- Households with pregnant women.

The conditionalities are as follows:

Education: Annual enrolment of school-age children in primary and secondary schools (where available) and regular attendance of at least 80 per cent of the school days per month.

Maternal and infant health: all pregnant women within beneficiary households shall attend a minimum of four prenatal medical examinations; they should deliver at a health facility or be assisted by skilled personnel and attend a post-natal check-up according to the country's health protocol. Children younger than two years shall attend regular check-ups at health services at least once every month, including regular growth monitoring and distribution of micronutrients and counselling. All children of the household aged between 24 and 60 months shall attend routine health services at least once every six months; for all children younger than five years, the health facility will provide full immunization.

Income test

The same PMT is applied as for basic social assistance (see above) in order to identify households that are likely to be below the food poverty line (Leite 2012).

Benefit amount and duration

A flat rate amount of TZS 4,000 per month is paid to households that contain one or more pre-primary school-age children (aged 0–6 years inclusive). TZS 1,000 per month is paid per primary school-age child (for a maximum of four children of this age). TZS 2,000 is paid per child in lower secondary school (for a maximum of three children of this age) and TZS 3,000 per child in high secondary school (for a maximum of two children). In practice, this benefit is paid every two months in order to reduce the costs of implementation; so, for example, TZS 2,000 is paid per primary school-age child six times per year. No more than TZS 19,000 in total can be paid per month per household for the basic cash transfer plus the variable cash transfer.

In PSSN Phase 2 (from 2021 onwards), a flat rate amount of TZS 5,000 per month is paid to households that contain one or more pre-primary-school-age children (aged 0–5 years inclusive). TZS 2,000 per month is paid per lower-primary-school-age child and TZS 4,000 per month per upper-primary-school-age child, but the combined payment cannot exceed TZS 12,000. TZS 6,000 is paid per child in lower secondary school and TZS 8,000 per child in upper secondary school, but the combined payment cannot exceed TZS 16,000. In addition, a payment of TZS 5,000 per month is paid to households containing one or more disabled people. No more than TZS 55,000 in total can be paid per month per household for the basic cash transfer plus the variable cash transfer.

TAZMOD notes

This benefit is targeted at households where children are unable to attend school or the clinic because of household poverty. The HBS does not measure pregnancy status of women and so this criterion cannot be simulated. Receipt of the benefit is dependent on the child attending school and going to the clinic. This raises the conundrum when designing the policy in TAZMOD that potentially eligible children would be those who do not comply with the conditions, whereas currently eligible recipients

will be complying with the conditions. For the time being, eligibility for this benefit in TAZMOD is simply linked to the existence of children of the various age ranges.

It is not possible to simulate the multi-stage decision-making roles of the Village Assembly and the community team.

2.3.3 Public works programme (PSSN: public works) (bun_tz)

Definitions

The public works programme enables beneficiaries to earn additional income through their participation in public works during four months of the lean season.

Eligibility conditions

The beneficiary must be of working age and the household must comply with the same eligibility conditions as for the basic cash transfer and must have been part of that initiative for six months.

Income test

This is the same as for the basic cash transfer.

Benefit amount

The public works programme offers a guaranteed 15 days of paid work per month for four months to enrolled households targeted under the PSSN. The daily wage rate is TZS 3,000 (or USD 1.5 per day) and the total a household can earn in a year is USD 90. The programme runs for three years.

In PSSN Phase 2 (from 2021 onwards), the daily wage rate remained set at TZS 3,000 per day.

TAZMOD notes

Within TAZMOD it is only possible to identify potentially eligible households on the basis of receipt of the basic cash transfer. The number of potentially eligible households will not take into account the limited duration of the scheme (see benefit amount). Although in practice an eligible household is able to choose which member of the household will participate in the scheme, participation is assigned to the head of the household in TAZMOD. This means that analysis of this policy by gender (whether with respect to the gender of the household head or at individual level) would be problematic.

Social contributions: Due to the many fragmented and overlapping pension policies in existence in Tanzania, and their small coverage, these have not been implemented in TAZMOD. Although it might be possible to simulate some of the schemes at a later stage, using information in the dataset about occupational status and job title, it would be important to ascertain how these schemes relate to the health insurance schemes as some overlap. So, it would be necessary to ensure that health insurance related contributions are not simulated twice.

2.3.4 Health insurance contributions (National Health Insurance Fund) (tsceehl_tz and tscerhl_tz)

Liability to contributions

This is a mandatory scheme for civil servants. Non-civil servants can join the fund too, but voluntarily.

Income base used to calculate contributions

The employee's gross income.⁵

Contribution rates

The employer and employee each contribute 3 per cent of gross earnings.

TAZMOD notes

The main assumption here is that contributions are simulated for all individuals in the formal sector, as a proxy for relevant contributors. In reality, some people may contribute to schemes other than the NHIF as there are a number of different schemes in play.

2.3.5 Pension fund contributions (NSSF and PSSF) (tscee_tz and tscer_tz)

Liability to contributions

NSSF is mainly for formal workers in the private sector, employees of international organizations employed in Tanzania, and some self-employed people.

PSSF is a mandatory scheme for all public employees who were members of earlier schemes for public service employees as well as new public service employees

Income base used to calculate contributions

For both NSSF and PSSF, the employee's gross income.⁶

Contribution rates

NSSF: The employer and employee each contribute 5 per cent of gross earnings.

PSSF: The employer pays 15 per cent, and the employee pays 5 per cent of gross earnings.

TAZMOD notes

The main assumption here is that NSSF contributions are simulated for all individuals in the formal sector, as a proxy for relevant contributors. Note that the majority of self-employed persons in Tanzania are informal workers who are not included in the scheme.

2.4 Personal income tax

Personal income tax is typically divided into three categories: presumptive income tax, which is a simplified tax payable by people whose turnover from self-employment is less than TZS 20 million per year; personal income tax for account cases, which is payable by people whose self-employment income exceeds the presumptive tax threshold; and PAYE for those in receipt of income from salaries and wages.

2.4.1 Tax unit

The tax unit is at the level of the individual.

⁵ For those who are not formally employed but wish to contribute to the fund, a lump sum can be paid of 88,000 TShs per year per adult and 50,000 TShs per year per child.

⁶ For those who are not formally employed but wish to contribute to the fund, a lump sum can be paid of TZS 88,000 per year per adult and TZS 50,000 per year per child.

2.4.2 Exemptions

Schedule 2 of the Income Tax Act Chapter 332 (revised 2008) details the types of incomes that are exempt from income tax. These include alimony, maintenance, and child support. In addition, the Minister may by Order exempt other types of income.

2.4.3 Tax allowances

We define tax allowances as any amount subtracted from pre-tax income (including social insurance contributions). Differently from Verbist (2004), there is no distinction between those that are fixed amounts (tax allowances) and those whose level is a function of pre-tax income (deductions). Tax rebates are deductions from tax payable (as distinct from tax allowances that are deductions from pre-tax income).

In Tanzania, contributions to pensions and health insurance schemes are treated as tax allowances. In addition, there are various capital and depreciation allowances where an individual is undertaking a business that is not subject to turnover tax.

2.4.4 Tax base

Personal income tax: Income from employment, property, land, agriculture, 'other income', and—for those whose turnover exceeds TZS 20 million per year for the years 2015–18 or exceeds TZS 10 million per year in 2019—self-employment income.

Presumptive income tax: Turnover from self-employment (for those whose turnover is less than TZS 20 million per year (for the years 2015–18) or less than TZS 10 million per year (for the year 2019).

2.4.5 Tax schedule

Personal income tax has five tax bands (see Table 2.4). Between 2015 and 2019, the only change that occurred was the rate for the second tax band (band 2) that was lowered from 11 per cent in 2015 to 9 per cent in 2016. In 2020 the band structure (but not the rates) was altered.

Table 2.4 Personal income tax bands (2015–21)

Tax band	Income band (TZS per year)	2015	2016	2017	2018	2019
		Rate (%)	Rate (%)	Rate (%)	Rate (%)	Rate (%)
1	0–2,040,000	0	0	0	0	0
2	2,040,001–4,320,000	11	9	9	9	9
3	4,320,001–6,480,000	20	20	20	20	20
4	6,480,001–8,640,000	25	25	25	25	25
5	≥8,640,001	30	30	30	30	30

Tax band	Income band (TZS per year)	2020	2021
		Rate (%)	Rate (%)
1	0–3,240,000	0	0
2	3,240,001–6,240,000	9	8
3	6,240,001–9,120,000	20	20
4	9,120,001–12,000,000	25	25
5	>12,000,000	30	30

Source: Tanzania Finance Act (2015, 2016, 2017, 2018).

Presumptive income tax also has five tax bands (see Table 2.5). No changes were introduced between 2015 and 2018, but changes were introduced in 2019. The bands and rates for 2020 and 2021 were the same as for 2019.

Table 2.5 Presumptive income tax bands (2015–21)

Taz band	Income band (TZS per year)	Rate (%)	Income band (TZS per year)	Rate (%)
	2015–18		2019–21	
1	0–4,000,000	0	0–4,000,000	0
2	4,000,001–7,500,000	3.0	4,000,001–7,000,000	3.0
3	7,500,001–11,500,000	3.8	7,000,001–11,000,000	3.0
4	11,500,001–16,000,000	4.5	11,000,001–14,000,000	3.0
5	16,000,001–20,000,000	5.3	14,000,001–100,000,000	3.5

Source: Tanzania Finance Act (2015, 2016, 2017, 2018, 2019).

TAZMOD notes

Personal income tax for account cases and for those in receipt of income from salaries and wages is treated as a single policy in TAZMOD as the rules are the same. For employed persons, simulation of personal income tax is restricted to those in the formal sector.

Withholding tax is not taken into account in TAZMOD because it is a payment administration mechanism rather than a tax (see Leyaro et al. 2015: 23–5).

2.5 Indirect taxes

2.5.1 VAT (tva_tz)

Tax unit

The tax unit is the household. VAT is simulated based on family purchases of goods and services.

Exemptions

VAT-exempted items are listed in the Value Added Tax Act 2014. These include supplies and imports of certain agricultural implements (e.g. tractors), agricultural inputs (e.g. fertilizers), livestock (e.g. cattle and swine), basic agricultural products (e.g. unprocessed fish), certain food items (e.g. rice and maize flour), fisheries implements, bee-keeping implements, dairy equipment, approved medicines, items for people with special needs, educational materials and services, types of healthcare provision, immovable property, certain petroleum products, and the supply of financial services.

Tax base

VAT is applied to transactions of certain goods and services.

Tax schedule

The standard rate of VAT is 18 per cent.

TAZMOD notes

The tax unit for the purposes of the VAT policy in TAZMOD is the household. VAT is simulated based on the household's purchases of goods and services. A total of 940 purchasable items are listed in the income list 'il_exp_vat01', with zero-rated or VAT-exempt items shown as 'n/a'—this income list relates to the HBS 2017–18, as the COICOP codes comprise those provided in that dataset. For earlier years, there is a different income list which was constructed using COICOP codes from the earlier HBS. An extension (switch) within the model determines which income list to use, depending on the user's selection of the dataset.

Using the HBS 2017–18, it is possible to identify purchases of sanitary towels (COICOP code x1213118). These were zero-rated in 2018 but were assigned the standard rate of VAT in 2019, and this has been reflected in the 2018 and 2019 systems in TAZMOD.

2.5.2 Excise duty (tex_tz)

Tax unit

The tax unit is the household. Excise duty is simulated based on family purchases of goods and services.

Tax base

Excise duty is payable on items specified in the Excise (Management and Tariff) Act, Chapter 147 (revised edition 2008).

Tax schedule

The Fourth Schedule of the Excise (Management and Tariff) Act, Chapter 147 (revised edition 2008) lists the excise duty payable on different items. However, this is updated annually.

TAZMOD notes

Excise duty is only simulated for certain items in TAZMOD (alcoholic drinks, tobacco products, and vehicle fuel including fuel levy).

Given that VAT is payable on the cost of these certain items *after* excise duty, a decision was made to simulate excise and VAT for these items in the same TAZMOD policy.

3 Data⁷

3.1 General description

The TAZMOD database has been drawn from the Tanzania HBS 2017–18 (MoFP-PED and NBS 2019), a cross-sectional survey that was conducted by the National Bureau of Statistics (NBS) (Table 3.1). The survey was conducted for mainland Tanzania to obtain updated information on poverty and living standards.

The survey was undertaken in Swahili, but the questionnaire is also available in English. It captures data on household expenditure and consumption; household members' demographics, income, education, economic activities, and health status; ownership of consumer goods and assets; housing structure and materials; household access to services and facilities; and food security. The survey is representative at national level and at regional level⁸, and for urban and rural areas.

⁷ This section provides details about the preparation of the HBS 2017–18 dataset. For details about the preparation of the previous dataset, HBS 2011–12 (NBS 2012), please refer to the previous country report (Leyaro et al. 2018).

⁸ There are 26 regions in mainland Tanzania. The sample design used in previous rounds of the HBS was developed to allow estimates at regional level (NBS 2019).

Table 3.1 TAZMOD database description

Original name	Household Budget Survey
Provider	National Bureau of Statistics
Year of collection	2017–18
Period of collection	December 2017–November 2018
Income reference period	The previous month or year before the first date of interview
Sample size	45,926 individuals and 9,465 households
Response rate	99%

Note: For further details about the survey, see NBS (2019).

Source: Authors' compilation.

HBS 2017–18 has been analysed by the NBS (2019), with analysis focusing on poverty relevant indicators.

The sampling was undertaken as a two-stage cluster sample design: 'The first stage involved selection of enumeration areas (primary sampling units—PSUs) from the 2012 Population and Housing Census (2012 PHC) Frame. A total of 796 PSUs (69 from Dar es Salaam, 167 from Other Urban Areas, and 560 from Rural Areas) was selected. The NBS carried out a listing exercise in which households residing in selected PSUs were freshly listed to update the 2012 PHC list before selecting households. The second stage of sampling involved systematic sampling of households from the updated PSUs list. A sample of 12 households was selected from each selected PSU. All household members, regardless of their age, who were usual members of the selected households, and all visitors who were present in the household on the night before the survey interview, were eligible for the survey.' (MoFP-PED and NBS 2019: 3).

Households are defined within the HBS as individuals who normally live and eat their meals together.⁹ The household head is identified by the household as the person who holds the role of decision maker and controls the welfare of the household.

3.2 Data adjustment

3.2.1 General data adjustments

The survey was supplied directly by the NBS as 72 separate data files that were merged with appropriate linkage variables. These varied by data file depending on the files to be merged and the availability of linkage variables within the files. The linkage variables utilized were: *HHID* (household ID); *interview__id* (long form interview identification number); *interview__key* (short form interview identification number); and a unique identifier created from *interview__key* and *TUS__id*.

No cases were dropped, although three cases did not have any data other than geographical information, weight, and information about the household head. These cases were retained to keep the total number of households at 9,465, and certain identifier and demographic variables were manually imputed for these cases (see Section 3.3).

There were four cases from Section 23 on crops that could not be matched with the main person file (using *interview__key*), so the information was disregarded.

⁹ On the challenge of defining a household in the Tanzanian context, see Randall and Coast (2015).

3.2.2 Income shocks resulting from the COVID-19 pandemic

Policy systems for years 2018–20 in TAZMOD v2.5 use Household Budget Survey (HBS) data from 2017–18. This means that incomes and consumption expenditures in the 2020 policy system are not adjusted downwards automatically despite the economic shock resulting from the COVID-19 pandemic.

For the courtesy of the user, TAZMOD v2.5 includes a new definitional policy, 'Ima_tz', that applies relevant shocks 'on-model' in 2020. When the policy is set 'on' (default in the 2020 policy system), a portion of workers in each industry transitions from paid employment to unemployment with zero market income. Household consumption expenditures are adjusted downwards accordingly based on absolute reductions in disposable income.

The adjustment is achieved by applying the 'transition shares' listed in Table 3.2 to randomly selected workers in each sector. The transition shares are derived from changes in each industry's GDP from its counterfactual value for 2020, computed based on the pre-pandemic, 2017–19 linear trend (see Lastunen 2022 for detailed information on the methodology). The GDP shocks are used as a proxy for average losses of market income in each sector. Specifically, it is assumed that the size of the proportional GDP shock in a given sector is equivalent to the share of workers who transition to unemployment with zero market income.

Note that the GDP shocks capture not just the pandemic but also other industry-level economic developments that took place in 2020 and deviated from pre-pandemic trends. Accordingly, the related labour market transitions and shocks apply to the entire year of 2020.

Additional details of the derivation of the GDP shocks (sectoral transition shares) and the modelling of income shocks are available in a separate technical note by Lastunen (2022). It is useful to emphasize that this particular method to modelling on-model shocks in TAZMOD is based on several assumptions, equivalent in all SOUTHMOD models, that the user is free to amend.¹⁰

Finally, subject to the availability of sectoral GDP data, future versions of TAZMOD will also introduce on-model shocks for the 2021 system year. Individual-level survey data will eventually become available that can be used to underpin the model, making it possible to account for the pandemic without separate on-model adjustments.

¹⁰ Among other assumptions made in the current implementation of on-model shocks, only market income ('yem', 'yse', and 'yag', items that make up the 'earnings' income list) is reduced. Furthermore, farm income ('yag') is only reduced for formal workers in the agricultural sector who have other sources of earnings ('yem' or 'yse'). The user can change the related parameters or rely on alternative assumptions. Lastly, any sector-level positive shocks are not taken into account.

Table 3.2: Transition shares from paid employment to unemployment with no market income

Industry number (lindi00)	Industry	Transition share
1	Agriculture	0
2	Mining and quarrying	0
3	Manufacturing	0.00338
4	Electricity	0.02726
5	Water	0.00020
6	Construction	0
7	Trade and repair	0.01750
8	Accommodation and restaurants	0.13219
9	Transport and storage	0.00094
10	Information and communication	0
11	Financial and insurance activities	0
12	Public administration	0
13	Professional scientific and technical activities	0
14	Administrative and support services	0
15	Real estate	0
16	Education	0.01641
17	Health	0
18	Other services	0.02098

Source: Authors' compilation.

3.3 Imputations and assumptions

The data as provided by the NBS did not contain any derived variables. Consistency checks were undertaken at the stage of the data collection (MoFP-PED and NBS, 2019).

It was determined from the derived variable *hhhrel* (relationship to head of household) that the three cases mentioned above with missing information for most variables were the head of household. Therefore, four derived variables relating to the head of household—*hhhage* (head of household's age), *hhhsex* (head of household's sex), *hhhmarst* (head of household's marital status), and *hhheduc* (head of household's education)—could be used to populate the demographic variables *dag*, *dgn*, *dms*, and *deh*, respectively, for these cases. Individual and household identifiers were then assigned to these individuals in the variables *idperson* and *idhh*.

Five cases did not have any information on age in either the variable *S1_4* (age of respondent) or *calc_age* (calculated age from date of birth). For these cases, the ages were manually imputed using information about relationship to head of household and presence/ages of children.

The possible responses to the question on marital status (*S1_7*) are: monogamous married, polygamous married, living together, separated, divorced, never married, widow, and not stated. For the 14,064 cases with a missing (not stated) value, 99.8 per cent were aged below 14 years. Tanzania's Marriage Act sets the minimum age for marriage as 18 years for boys and 15 years for girls (with parental consent), but both girls and boys can marry at 14 years of age with the court's permission. Any cases with a missing value who were under 14 years were recoded as single in the *dms* variable. In addition, 19 children under 14 who were coded as married in the *dms* variable (11 living together, 8 monogamous married) were recoded as single. Any cases with a missing value who were spouses of the head of household were recoded as married in the *dms* variable. For the remaining cases the data were examined, and marital status was imputed as either single or married.

In two households the head was absent, and therefore a replacement head had to be identified for the variable *dhh*. In both cases the spouse of the head of household was regarded as the head.

The *idpartner* variable could only be constructed using the relationship to head of household variable (*S1_1*). For polygamous marriages, the senior wife (i.e. spouse with lowest *memid*, who was usually the oldest wife) was identified and defined as the partner. Because of a lack of information about partners in the dataset, there were 2,563 individuals aged 14 or over who were recorded as married or living together for whom a partner could not be identified.

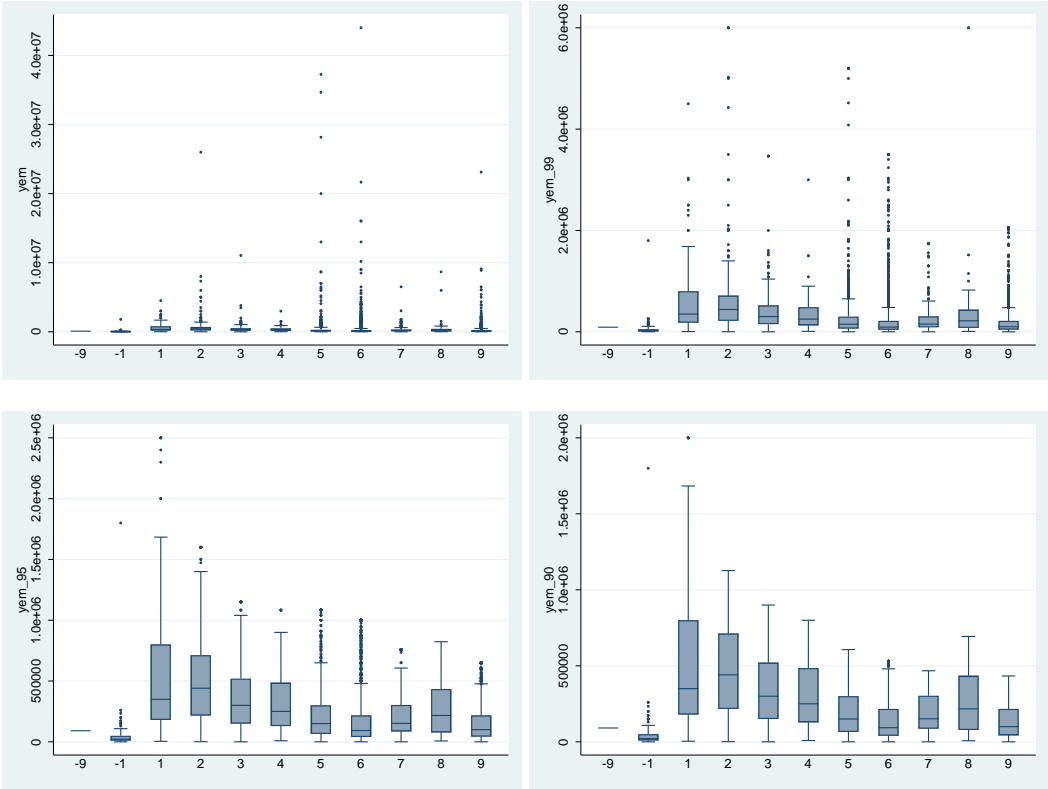
The compulsory variables *idfather* and *idmother* were created using the variables *S2_1A* and *S2_6A*, which give the line number of the father/mother. A large number of children under 18 were missing the information for *idfather/idmother*. Some additional cases were captured where *idfather/idmother* was missing but the child was assigned as the son/daughter, stepson/stepdaughter, or adopted son/daughter of the household head. After this step, there were just 11 cases where an *idfather* could not be identified where the father is living in the household (according to *S2_1*). However, in total there were 7,549 cases below 18 years of age where *idfather* could not be coded. The same process was undertaken for *idmother*, leaving just 46 cases where an *idmother* could not be identified where the mother is living in the household (according to *S2_6*), and 4,980 children under 18 in total where *idmother* could not be coded. Combining *idfather* and *idmother* into *idparent* revealed that 3,583 children had neither an *idfather* nor an *idmother*. All children without a value for *idfather* or *idmother* were assigned to either the male or female household head as the majority of them were grandchildren or other close relative of the household head. At the end of this process there were eight 'loose children', all of whom are head of household and therefore could not be assigned a value for *idparent*.

Several income variables contained obvious anomalies and were cleaned, specifically income from employment, income from self-employment, and income from agriculture. These cleaning steps are documented below along with the other adjustments made to the data.

Employment income in the HBS is separated into 'main job' and 'secondary job', along with a periodicity variable that specifies whether the money was paid monthly or weekly. There were ten cases (for main job) where the periodicity was not stated and so the employment income was set to zero. Unlike in the previous HBS, there is not a variable in the dataset which details the number of months worked in the previous 12 months which could be used to adjust employment income. Income from primary and secondary jobs was summed, and this was then capped at the 90th percentile (of cases with employment income) in each occupational class (*loc*). The following boxplots document the progression from no capping, through capping at the 99th, 95th, and 90th percentiles in order to show how the decision was reached to cap at the 90th percentile. When capping at the 90th percentile, the majority of outliers¹¹ of *yem* within each occupational category disappear.

¹¹ Defined in Stata as values more than 1.5 times the interquartile range distant from either the upper or lower quartile.

Figure 3.1: Boxplots of employment income (yem) by occupational class with yem capped at different percentiles (of cases with yem)



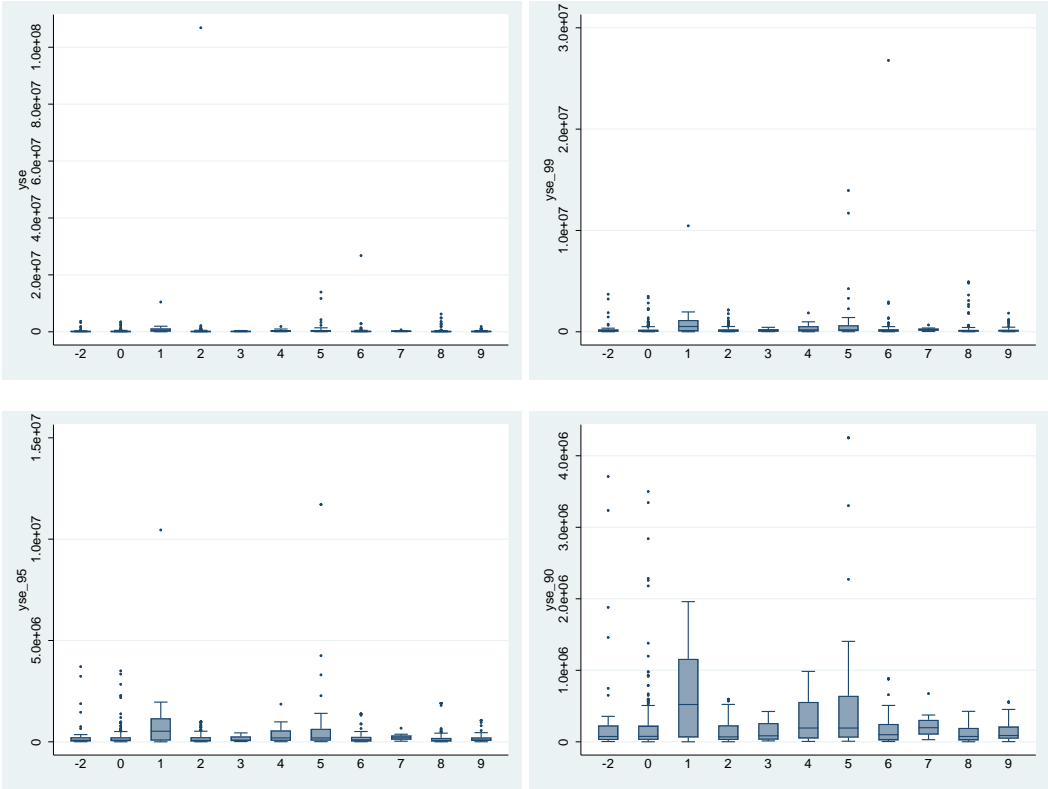
Key: 0. Armed forces; 1. Senior officials and managers; 2. Professionals; 3. Technicians and associate professionals; 4. Clerks; 5. Service and sales workers; 6. Skilled agricultural; 7. Craft and trades workers; 8. Plant and machine operators; 9. Elementary occupations; -1. Not applicable; -9. Not specified.

Source: Authors' elaboration of TAZMOD input data.

Income from employment was assumed to be net pay (the question asks 'How much in cash was the respondent paid from his/her main job?') and was converted to employment gross income (yem) using a technique described below.

In order to calculate net taxable income for self-employed income (yse), it was necessary to deduct expenses from sales. Unfortunately, this was dealt with only at a monthly level and so a large number of negative values were generated where expenses exceeded sales in that particular month. However, many of these cases will be covered by presumptive tax (a tax on turnover, which does not require information on expenses). Yse was capped at the 90th percentile (of cases with yse) within CPC (major) code (S10_02_1c). The following boxplots again show how the outliers largely disappear when capping at the 90th percentile.

Figure 3.2: Boxplots of self-employment income (yse) by CPC code with yse capped at different percentiles (of cases with yse)



Key: 0. Agriculture, forestry, and fishery products; 1. Ores and minerals; electricity, gas, and water; 2. Food products, beverages, and tobacco; textiles, apparel, and leather products; 3. Other transportable goods, except metal products, machinery, and equipment; 4. Metal products, machinery, and equipment; 5. Constructions and construction services; 6. Distributive trade services; accommodation, food, and beverage serving services; transport services; and electricity, gas, and water distribution services; 7. Financial and related services; real estate services; and rental and leasing services; 8. Business and production services; 9. Community, social, and personal services.

Source: Authors' elaboration of TAZMOD input data.

Income from agriculture (*yag*) is the sum of crop and livestock sales minus the sum of crop and livestock costs, which again generated a large number of negative values. *Yag* was also capped at the 90th percentile (of cases with *yag*), with a similar pattern seen with the outliers (boxplots not presented here as there is only one category).

Other income paid to children was deemed to be maintenance and excluded from *yot* but rather included in *yot01*.

Cleaning steps were also undertaken on the expenditure data to remove some anomalies. The values for two items were set to zero as they were deemed implausible: one household with expenditure on catering services at events costing TZS 433,355,010 (approximately US\$ 188,415) and one household with expenditure on a motorcycle costing TZS 150,000,000 (approximately US\$ 65,217) (monthly values). Information on expenditure is collected in the diary and main questionnaire, and for a number of items (identified by COICOP code) there is information in both the diary and the questionnaire. If both sets of information are included, then expenditure will be double counted for these items. Expenditure information obtained from the diary had reportedly been cleaned and therefore was given priority over the questionnaire data. Each expenditure item was capped at the 95th percentile (of cases with a value for that COICOP code), except for the food items which are taken exclusively from the diary and therefore had already been cleaned.

VAT and Excise duty (where applicable) were removed from expenditure items so that expenditure is brought into the model ex-VAT and Excise. This simplifies the modelling of indirect taxes on the

model. The VAT and Excise duty removed are carried into the model as the variables for imputed VAT (*tvaiv*) and imputed Excise duty (*texiv*). Any cigarettes, tobacco, or petrol expenditure and quantity values were set to zero where the base expenditure, after having subtracted the quantity-based excise, yielded a negative figure.

Although the diary data had been cleaned, there were some issues identified with the cleaned unit variable. In the cleaned unit variable, units are expressed as either 'kilogram or litre' (value 1) or 'units' (value 2). Whether the unit should be 'kilograms or litres' depends on the item in question (e.g. kilograms for tobacco, litres for liquids), while 'units' will only apply to cigarettes. For some instances of wine, spirits, and beer, 'units' were specified instead of 'litres'. In these cases, 'units' were treated as 'litres' for liquids.

For the correct functioning of estimates of Consumption Poverty using the Statistics Presenter application within the model, an imputed income tax variable was also imputed, and a number of other variables were constructed (see DRD).

3.3.1 Time period

The survey data were collected between December 2017 and November 2018. Income data were gathered in relation to the previous month or year before the first date of interview.

3.3.2 Gross incomes

The HBS does not contain information about gross employment income. It had been hoped that it would be possible to use the Labour Force Survey (LFS) to generate a net-to-gross ratio for employment income (by area and employment type) which could be applied to the HBS data. However, following enquiries with the NBS and scrutiny of the LFS data, it was ascertained that the LFS does not capture information on net incomes, so this option was not possible.

Therefore, an alternative approach had to be applied in order to obtain a net-to-gross ratio for employment income within the HBS. This involved computing net income for a series of gross incomes using the information on tax bands, tax rates, and health insurance employee contribution rates (i.e. reverse-engineering the tax system). Grossing-up factors were calculated accordingly for various income bands.

3.3.3 Disaggregation of harmonized variables

It was not necessary to disaggregate composite variables for the TAZMOD dataset.

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 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.

The list of uprating factors as well as the sources used to derive them can be found in Table 3.3.

The NBS was approached for the appropriate consumer price index data. They provided the team with separate indices for food items and non-food items, rebased to December 2015. Given that the Tanzanian financial year runs from 1 July to 30 June, a decision was made to uprate the model to a time point of 1 July in each year and the uprating indices have been adjusted accordingly.

3.5 Consumption levels

Consumption levels are based on the original reported consumption levels in the input data (xhh). These 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 (e.g. COVID-related decreases in earnings) as well as changes in benefits and contributions. The underlying assumption is that changes in disposable incomes lead to the same changes in consumption levels. In recognition of the fact that there may be some consumption of own-account produced food, in cases where the base year disposable income is higher than the disposable income in the policy year, a proportion of the original consumption is assumed to be unaffected. This proportion is assumed to be 25 per cent of the original consumption following Tschirley et al. (2015).

Table 3.3 Raw indices for deriving TAZMOD uprating factors

Index	Constant name	Values of the raw indices										Income components uprated by the index	Notes
		2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
Overall CPI (Base Dec 2020=100)	\$f_CPI_Overall	58.19	67.34	72.41	77.15	82.13	86.31	90.77	93.77	97.25	100.49		Rebasing involved methodology change
Food CPI (Base Dec 2020=100)	\$f_CPI_Food	50.59	60.88	66.1	71.3	78.52	84.49	92.04	94.62	97.35	101.03	Food	
Non Food CPI (Base Dec 2020=100)	\$f_CPI_Non_Food	66.95	73.63	79.02	82.91	84.05	86.75	89.49	93.27	97.18	100.27	Non-food	
Alcohol CPI (Base Dec 2020=100)	\$f_CPI_Alcohol	62.26	73.5	82.28	86.14	88.81	93.66	95.87	96.68	100.2	100.34	Alcohol	Same as for tobacco
Tobacco CPI (Base Dec 2020=100)	\$f_CPI_Tobacco	62.26	73.5	82.28	86.14	88.81	93.66	95.87	96.68	100.2	100.34	Tobacco	Same as for alcohol
Fuel (Base Dec 2020=100)	\$f_CPI_Fuel	42.71	49.67	56.08	63.92	62.6	67.18	73.08	86.64	94.67	100.09	Energy and fuels—combining electricity and other fuels for use at home with petrol and diesel	

Note: CPI, consumer price index.

Source: Authors' compilation, based on information supplied by NBS (2014a, 2014b) and from NBS website.

4 Validation

4.1 Aggregate validation

TAZMOD results have been validated against external benchmarks where feasible. The main discrepancies between TAZMOD results and external benchmarks are discussed in the following sub-sections. Factors that may explain the observed differences are also discussed.

Validation data for the years 2012 and 2015–17, which are compared against TAZMOD outputs using an underpinning dataset derived from the HBS 2011–12, can be found in Leyaro et al. (2019). The focus is therefore mainly on validation data for 2018–20.

4.1.1 Validation of incomes inputted into the simulation

It was not possible to validate the number of recipients of various types of market income in the input dataset using external statistics, nor the aggregate annual amounts of various types of market income. It was also not possible to assess the extent to which non-simulated policies are adequately captured.

4.1.2 Validation of outputted (simulated) incomes

Table A2 in Annex 1 compares the number of recipients of various types of simulated benefits/number of payers of simulated taxes or simulated social insurance contributions in TAZMOD with external statistics. The external figures for PSSN were obtained at household level and so reported simulations are also presented at household level—for 2020, TAZMOD simulates 73 per cent of the reported number of beneficiary households. There are several reasons why the simulated and reported numbers of beneficiary households may differ (see Wright et al., 2019). The simulated number of NHIF contributors in TAZMOD is much higher than the reported number of contributors in 2019 (223 per cent of the reported figure), falling to 158 per cent in 2020. The over-simulation will partly be due to the fact that the NHIF policy is applied in TAZMOD to all formal sector employees and not just certain occupational classes.

Table A3 compares the simulated and published aggregate yearly amounts for the simulated taxes and benefits in 2018–20. For direct taxes in 2020 (i.e. presumptive tax plus PAYE plus those who prepare accounts) TAZMOD simulates 105 per cent of the figure provided by the TRA. The external figure is calculated as the sum of TRA's totals for Direct tax from Domestic Revenue (Individuals plus PAYE) plus Direct Tax from Large Taxpayers (PAYE). However, in addition, TRA report separately direct tax payable on rent and interest. The amount for these items cannot be broken down between individual and corporate recipients. The simulated tax includes tax on rent and interest payable by individuals. This will explain, in part, why the model simulates over 100% of direct taxes. Moreover, the TRA reported figures are on a "cash flow" basis rather than an "accrual" basis whereas the model computes on "accrual" basis. This means that the TRA figures and those in the model will not be strictly comparable.

As can be seen, TAZMOD simulates much higher employer and employee contributions to NHIF than the reported figures. Again, this will partly be due to the fact that the policy in TAZMOD is applied to all formal sector employees and not just certain occupational classes.

TAZMOD simulates only 6 per cent of excise duty in 2019, rising to 13 per cent in 2020. The external figure for excise duty is the sum of domestic revenue from Excise on spirits, wine & liquor, and cigarettes, plus income from the Fuel Levy, plus the sum of revenue from Large Tax Payers from Excise on beer, cigarettes, and Spirits & Konyagi. The fuel levy inflates the external validation figure

considerably, and in practice the main payers of the fuel levy will not be captured in the HBS as they will be commercial operators.

Finally, TAZMOD over-simulates VAT for 2018, 2019, and 2020 (135, 132, and 137 per cent of revenue, respectively). The external figure for VAT is the sum of 'VAT-local' from the Domestic Revenue Department and from the Large Taxpayer Department less VAT Refunds. As with income tax it is worth noting that the VAT is reported by TRA on a "cash flow" basis rather than an "accrual" basis and hence the large impact of VAT refunds.

4.2 Income distribution

In Tanzania, poverty analysis is undertaken using consumption data, so the income-based poverty analysis of the TAZMOD output data will differ greatly from the published figures, but the consumption-based poverty analysis is similar to the published figures. The coefficients for the Adult Equivalence Scale used by the NBS are shown in Table 4.1.

Table 4.1 Coefficients for the Adult Equivalence Scale

Age (years)	Male	Female
0–2	0.40	0.40
3–4	0.48	0.48
5–6	0.56	0.56
7–8	0.64	0.64
9–10	0.76	0.76
11–12	0.80	0.88
13–14	1.00	1.00
15–18	1.20	1.00
19–59	1.00	0.88
60+	0.88	0.72

Source: NBS (2014b: 52).

4.2.1 Income inequality

In Tanzania, inequality is measured with reference to consumption, not income. Table A4 in Annex 1 shows the TAZMOD Gini coefficients for 2018–20 (0.38), which is the same as the published Gini coefficient using the HBS 2017–18. Using income data, the Gini coefficient in 2020 was 0.71.

4.2.2 Poverty rates

Table A5 in Annex 1 shows that using the TAZMOD output data for 2020, 26.5 per cent of the population were in basic needs poverty, and 8.2 per cent were in food poverty, using consumption data. Income-based poverty levels are much higher at 65.7 per cent for basic needs poverty and 58.7 per cent for food poverty in 2020.

4.3 Summary of 'health warnings'

As far as we have been able to ascertain, the income data in the HBS 2011–12 and HBS 2017–18 datasets have not been used previously for research purposes. Although some data cleaning processes have been undertaken, there are several ways in which this work could be extended.

Every effort has been made to collate the precise tax and benefit rules, but this was difficult to achieve and has been an iterative process.

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Annex

Table A1 Unemployment and employment figures

	TAZMOD 2018 (A)	External 2018 (B)	Ratio (A/B)
Number of employed individuals	12,374,560	21,984,534	56%
Number of unemployed individuals	849,255	2.3 million	37%

Notes: Column A: employed individuals = weighted total of those whose employment status is 'working on own farm', 'employer or self-employed', or 'employee' in response to the question about main status in the past 12 months, but excludes those who are 'unpaid household helper in business' and 'unpaid household helper in agriculture'. Unemployed individuals = weighted total of only those who stated that their main status in the past 12 months is 'long term unemployed', so this will exclude unemployed individuals who do not self-identify as long-term unemployed.

Source: Column A: TAZMOD version 2.1. Column B: NBS (2019: 39) and NBS (2020: 41).

Tables A2 and A3 are found after Tables A4 and A5.

Table A4 Income inequality

Year	TAZMOD		External consumption-based Gini (C)
	Income-based Gini (A)	Consumption-based Gini (B)	
2012	0.77	0.36	0.34
2015	0.76	0.35	-
2016	0.76	0.35	-
2017	0.76	0.35	-
2018	0.71	0.38	0.38
2019	0.71	0.38	-
2020	0.71	0.38	-

Notes: TAZMOD and external source both use the same equivalence scale.

Source: Columns A and B: TAZMOD version 2.5 using HBS 2011–12 for years 2012–17 inclusive (NBS 2012) and HBS 2017–18 for years 2018–20 (MoFP-PED and NBS 2019). Column C: NBS (2013: 6) for 2012; MoFP-PED and NBS (2019: 15) for 2018.

Table A5 Poverty rates

Year	TAZMOD (income-based)		TAZMOD (consumption-based)		External (consumption-based)	
	Basic needs poverty (A)	Food poverty (B)	Basic needs poverty (C)	Food poverty (D)	Basic needs poverty (E)	Food poverty (F)
2012	69.06	62.11	29.90	11.37	28.2	9.7
2015	68.93	61.89	30.09	6.59	-	-
2016	68.93	61.91	30.11	6.93	-	-
2017	68.95	61.97	30.21	7.07	-	-
2018	65.52	58.57	26.38	8.01	26.4	8.0
2019	65.52	58.57	26.40	8.01	-	-
2020	65.72	58.71	26.53	8.22	-	-

Notes: TAZMOD and external source both use the same equivalence scale. The 2011–12 HBS food poverty line is TZS 26,085.50 per adult equivalent per month. The 2011–12 HBS basic needs poverty line is TZS 36,482 per adult equivalent per month. These figures were inflated using the CPI for the years 2015–2017 inclusive. The new food poverty line is TZS 33,748 per adult equivalent per month, and the new basic needs poverty line is TZS 49,320 per adult equivalent per month.

Source: Columns A–D: TAZMOD version 2.5 using HBS 2011–12 for 2012–17 inclusive (NBS 2012) and HBS 2017–18 for years 2018–20 (MoFP-PED and NBS 2019). Columns E and F: NBS (2014a: 97) and MoFP-PED and NBS (2019: 10).

Table A3 Tax and benefit instruments simulated in TAZMOD: Annual amounts (TZS)

Tax–benefit policy	TAZMOD 2018, million TZS A	TAZMOD 2019, million TZS B	TAZMOD 2020, million TZS C	External 2018, million TZS D	External 2019, million TZS E	External 2020, million TZS F	Ratio 2018 G	Ratio 2019 H	Ratio 2020 I
Presumptive tax	4,922	13,074	13,821						
Personal income tax (PAYE and accounts)	2,854,040	2,966,717	2,557,132	2,597,895	2,780,058	2,444,569	110%	107%	105%
VAT	3,349,890	3,484,369	3,598,299	2,483,125	2,649,297	2,633,436	135%	132%	137%
Excise duty	83,567.65	83,573.03	83,573.25	1,310,246	1,343,715	627,791	6%	6%	13%
NSSF contributions (employer and employee)	900,186	933,592	955,184	787,500	1,078,070	1,201,050	114%	87%	80%
PSSSF contributors (employer and employee)	858,917	890,793	916,521	1,387,240	1,398,430	Not available	62%	64%	N/A
NHIF contributions (employer and employee)	795,958	825,496	846,158	415,982	431,003.12	497,530	191%	192%	170%
PSSN	175,560	175,560	175,560	401,908	169,975	171,788	44%	103%	102%

Notes: For results using the earlier HBS for the policy years 2012, 2015, 2016, and 2017, see the TAZMOD v1.8 country report (Leyaro et al. 2019). The PSSN figure in Column D was calculated by averaging the payments that were made in Nov–Dec 2018 and in Jan–Feb 2019 and multiplying by 12 to obtain an annual amount. The composite external figure for direct taxes is the sum of TRA’s totals for direct tax from domestic revenue (individuals plus PAYE) plus direct tax from large taxpayers (PAYE); and the ratios in the final three columns are calculated as the sum of presumptive tax and personal income tax derived from TAZMOD, divided by the TRA composite figure.

Source: Columns A–C: TAZMOD version 2.5. Columns D–F: direct and indirect tax data—TRA (2019, 2020, 2021). NHIF data—NHIF (2019) and CAG (2021). PSSN data was supplied by TASAF by special request (TASAF 2021). NSSF and PSSSF data—PSSSF (2020) (for PSSSF) and CAG (2021) (for NSSF).