SOUTHMOD

Country report

Mozambique

MOZMOD v2.10
2015–2022

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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), Zambia (MicroZAMOD), and Zanzibar (ZANZIMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents MOZMOD, the SOUTHMOD model developed for Mozambique. This work was carried out by the Ministry of Economy and Finance of Mozambique in collaboration with the project partners.

The results presented in this report are derived using MOZMOD version 2.10 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 MOZMOD results against external data sources. For further information on access to MOZMOD and other SOUTHMOD models, see the SOUTHMOD page.

The MOZMOD 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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The United Nations University World Institute for Development Economics Research provides economic analysis and policy advice with the aim of promoting sustainable and equitable development. The Institute began operations in 1985 in Helsinki, Finland, as the first research and training centre of the United Nations University. Today it is a unique blend of think tank, research institute, and UN agency—providing a range of services from policy advice to governments as well as freely available original research.

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Acronyms

BSSP	Basic social subsidy programme (*Programa do Subsídio Social Básico*), a sub-programme of DSA
CPI	Consumer price index
DRD	Data requirement document
DSA	Direct social action (*Acção Social Directa*)
DSSP	Direct social support programme (*Programa Apoio Social Directo*), a sub-programme of DSA
FYA	Full-year adjustment
GdM	Government of Mozambique (*Governo de Moçambique*)
INAS	National Institute of Social Action (*Instituto Nacional de Acção Social*)
INE	National Institute of Statistics (*Instituto Nacional de Estatística*)
IOF	Household Budget Survey (*Inquérito aos Orçamentos Familiares*)
IRPS	Personal income tax (*Imposto sobre o Rendimento das Pessoas Singulares*)
ISPC	Simplified tax (*Imposto Simplificado para Pequenos Contribuintes*)
MGCAS	Ministry of Gender, Children and Social Action (*Ministério do Género, Criança e Acção*)
MMAS	Ministry of Women and Social Action (*Ministério da Mulher e Acção Social*)
Mt	Metical
NBSSS	National basic social security strategy (*Estratégia Nacional de Segurança Social Básica*)
NISS	National Institute of Social Security (*Instituto Nacional de Segurança Social*)
PASP	Productive Social Action Programme *(Programa Acção Social Produtiva)*
PdM	Parliament of Mozambique (*Parlamento de Moçambique, ou Assembleia da República*)
PSU	Primary sampling unit
UNDP	United Nations Development Programme
VAT	Value-added tax (*Imposto sobre o Valor Acrescentado*)

1 Basic information

1.1 Basic information about the tax–benefit system

Mozambique is defined as a low-income country by the World Bank and a low-human-development country by the United Nations Development Programme (UNDP) but has experienced rapid growth for more than two decades, averaging 7.9 per cent between 1993 and 2015—among the highest in sub-Saharan Africa (World Bank 2021). This trend was interrupted, and the economic growth fell to an average of 2.4 per cent[1] in 2016–21 due to a combination of natural disasters, the COVID-19 pandemic, and the revelation of undisclosed debts which led to a crisis of economic governance. There is a strong commitment to reducing the levels of poverty in Mozambique. For example, Mozambique's National Development Strategy 2015–35 commits to providing social security to 75 per cent of poor and vulnerable households by 2035 (United Nations Mozambique 2015: 13).

The official age at which people may start to work in Mozambique is 18 years (PdM 2007a, 2007c).[2] The Labour Law allows young people aged 15–17 years to work, as long as they do not work more than 38 hours a week and 7 hours a day.

Female workers are entitled to state pension at the age of 55 years and male workers at the age of 60 years, or after 35 working years (PdM 2009a).

Children start school at the age of six years.[3] The new law of the National Education System defines six years of primary education as the minimum number of schooling years (PdM 2018).

The fiscal year runs from 1 January to 31 December.

Main taxes such as on personal income, corporate income, value added, excise and customs duties are defined by common laws at the national level (GdM 2002; PdM 2009b, 2009d, 2012a, 2012b, 2012c, 2013). For specific local taxes, rates may vary among municipality categories, such as the case of personal municipal tax (GdM 2008a, 2008c).

The personal income tax *Imposto sobre o Rendimento das Pessoas Singulares*[4] (IRPS) law 33/2007 defines dependent members of the family as those below 18 years according to Labour Law and those up to 25 years who are working and earning less than the annual highest minimum salary, or are also studying or in the military service (PdM 2007b, 2007d). Other specific categories apply to this definition of dependent members of the family.

The IRPS law approved in 2007 was revised in 2013. Therefore, for the cases where tax calculation has changed both periods will be mentioned: 'up to 2013' and 'from 2014 onwards'. Up to 2013, income tax for a couple was calculated jointly (ACIS et al. 2011a). For applying a tax rate, taxable income was divided by two as if it was calculated individually. After applying the tax rate, income tax was multiplied by two to obtain the joint income tax for the couple. From 2014 onwards, income tax is calculated individually, and not as a couple (PdM 2013).

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[1] Data calculated by National Institute of Statistics.

[2] PdM refers to 'Assembleia da República' in Mozambican publications.

[3] Children enroll in first grade if they turn six between 1 January and 30 June. Those who turn six between 1 July and 31 December enroll the following year.

[4] All foreign terms have been translated from Portuguese.

Up to 2013, different income sources were taxed using the same procedure. The calculation started with employment income tax, that is, income from salaries and wages. The other income sources were added up in the second stage of calculation. From 2014 onwards, employment income tax is calculated using a different procedure from income originated from other sources, such as self-employment, capital, property, and other.

Taxpayers need to file a tax return. Up to 2013, income tax was withheld by employers and paid to tax authorities. At the beginning of each fiscal year, taxpayers were expected to fill and submit a tax return on annual income referring to the previous fiscal year. Tax authorities would assess the tax return forms and decide the tax liability for each taxpayer, that is, if a taxpayer should pay any additional amount, be reimbursed, or be even.

From 2014 onwards, taxpayers still need to fill and submit tax returns. However, tax authorities do not change the tax liability status of each taxpayer. Withholdings match the exact amount due at the end of the fiscal year. The rates and amounts that should be paid are clearly defined, as well as the payment schedule.

Since 2015, taxpayers whose income derives from salaries and wages have not been required to submit a tax returns form.

Tax nominal values are adjusted periodically through updated legislation. For instance, tax values were set by Ministerial Diploma No. 109/2008 dated 27 November, Ministerial Diploma No. 243/2011 dated 12 October, and Ministerial Diploma No. 64/2013 dated 12 June (Ministry of Finance 2011; Sal & Caldeira 2013).

Lone parents do not receive special tax benefits, according to clause 18 of the IRPS law (PdM 2007d). The benefits accrue as the number of dependent family members increases (PdM 2013). People receiving a pension as retired workers, invalids, or surviving members of the family do not pay personal tax (PdM 2007d). Companies' expenditures on social services and leisure activities for workers are eligible for tax reductions.

The legal framework on social protection in Mozambique was approved by Law No. 4/2007 of 7 February. Under this law, the social security system is structured in three different levels: basic social security (*Segurança Social Básica*), compulsory social security (*Segurança Social Obrigatória*), and complementary social security (*Segurança Social Complementar*).

Further, the Government of Mozambique (*Governo de Moçambique*, GdM) approved the regulation of the basic social security sub-system (*Subsistema de Segurança Social Básica*) by Decree No. 85/2009 of 29 December. The approved regulation establishes the rights of the most vulnerable target groups and sets the types of benefits for those target groups:

- Risk allowances (*prestação de risco*): support in goods, products, payment services, and financial values to mitigate risks or ensure survival and regular monetary social transfers;
- Provision of social support (*prestação de apoio social*): social transfer for a fixed term and social insertion programmes through work.

For the operation of the regulation of the basic social security sub-system, GdM approved through the Resolution of Cabinet No. 17/2010 of 27 May the national basic strategy for social security (NBSSS, *Estratégia Nacional de Segurança Social Básica*) for the period 2010–14 (see GdM 2010).

Still, challenges exist despite the expansion of the coverage of basic social security programmes and the increase in budget allocated to social protection. The World Bank observed in 2012 that:

> Generally, the major social assistance programs in Mozambique have low coverage relative to the number of individuals at risk. [. . .] Those who remain largely uncovered by the [social protection] system in Mozambique are poor families with children, young people, and the working poor, particularly those facing recurrent weather-related shocks. (World Bank 2012: 83)

Hodges and Pellerano (2010) undertook a detailed study of the social protection system for the United Nations Children's Fund in Mozambique and highlighted the fragmented nature of provisions. Since then, the International Labour Organization and others have worked closely with GdM to further develop the vision for comprehensive social security (Cunha et al. 2013; United Nations Mozambique 2015). In addition, Mozambique is a flagship country for the One UN Initiative, which emphasizes the importance of coordination across different UN agencies when interacting with the government of a country. The collaborations around the development of a social protection floor are considered to be a 'best practice' example of this initiative (United Nations Mozambique 2015: 7).

More recently, the authorities have prepared a new strategy on basic social security: the NBSSS 2016–24. This was approved by the Council of Ministers in February 2016 at the Fifth Ordinary Session. The new strategy was intended to help realize GdM's Five Year Programme for 2015–19 through the implementation of actions that will contribute to poverty reduction and ensure that the growth of the Mozambican economy benefits all citizens, especially those living in poverty, and prioritizes their social rights. Therefore, social security arrangements in Mozambique have been undergoing significant changes (United Nations Mozambique 2015). Most recently, the programmes were revised via Decree No. 47/2018 of August 6, and these revisions are included in the 2019–20 systems of MOZMOD and described below.

The means test for social assistance payments takes into account, among other things, both the individual's and the household's monthly income. The amounts of subsidies to be transferred to the beneficiaries are adjusted for inflation, and according to Decree No. 52/2011 of 12 October, the amount can be reviewed annually by the Council of Ministers.

1.2 Social benefits

The NBSSS operates in four key areas associated with specific institutional responsibilities. One key area that can be located most easily within the category of social benefits is direct social action (DSA, *Acção Social Directa*). DSA itself has three strands that are listed here, although the third strand is not strictly a social benefit.

Benefit 1 (*Programa do Subsídio Social Básico*): The basic social subsidy programme (BSSP) includes unconditional regular cash transfers and is described in detail below.

Benefit 2 (*Programa do Apoio Social Directo*): The direct social support programme (DSSP) consists of time-limited in-kind support for eligible households and is described in detail below. Additional support was provided as part of this programme due to the COVID-19 pandemic (*Programa do Apoio Social Directo Transferências directas pós-emergência,* PASD-PE 'Covid'). This policy is not simulated within MOZMOD v2.9.

Benefit 3 (*Programa dos Serviços Sociais de Acção Social*): The programme of social services of social action consists of social welfare services, including provision of institutional assistance by providing shelter in social facilities such as crèches, elderly support centres, transit centres, child shelter centres, open centres, and shelter centres for abandoned individuals with severe deficiencies. It also includes social work activities in the communities with individuals living in the streets, children, the elderly, and

individuals with deficiencies. These services consist of psychosocial support, access to information, guidance, and family reunification. This policy was renamed PAUS (*Programa de Atendimento em Unidades Sociais*) in 2018. Additional support was provided as part of this programme due to the COVID-19 pandemic. This policy is not simulated within MOZMOD v2.9.

Coordination of DSA is the responsibility of the former Ministry of Women and Social Action (*Ministério da Mulher e Acção Social*, MMAS), now the Ministry of Gender, Children and Social Action (*Ministério do Género, Criança e Acção Social*, MGCAS), whereas the implementation is conducted by its subordinate institutions including the National Institute of Social Action (Instituto Nacional de Acção Social, INAS), civil society organizations, and faith-based organizations.

In 2018, Decree No. 47/2018 of August 6 introduced revisions to the social security arrangements. BSSP and DSSP were retained as initiatives, but the eligibility criteria were changed quite considerably; these changes are reflected in the 2019–20 systems of MOZMOD v2.9.

1.2.1 Not strictly benefits

The three remaining key areas of NBSSS are not strictly benefits and are described as follows.

Not strictly benefit 1 (*Acção Social Escolar*): The school social action fund covers actions that have the objective of promoting the participation of the most vulnerable pupils/students in the education system. The responsibility of implementing student welfare is that of the former Ministry of Education, now the Ministry of Education and Human Development (*Ministério da Educação e Desenvolvimento Humano*), in coordination with MGCAS and its subordinate institutions. This fund is payable to schools. This policy is not simulated within MOZMOD v2.9.

Not strictly benefit 2 (*Acção Social da Saúde*): Health social action includes actions with the objective of improving the quality of health of the most vulnerable populations, with special emphasis on promoting access to basic healthcare. The responsibility of implementation lies with the Ministry of Health (*Ministério da Saúde*) in coordination with MGCAS–INAS. This mainly consists of enabling pregnant women and the poor and elderly to receive treatment at health centres when they cannot pay the fee of Mt 1 per visit. This policy is not simulated within MOZMOD v2.9.

Not strictly benefit 3 (*Programa Acção Social Produtiva*): Productive social action was designed to cover activities that aim to promote the socioeconomic inclusion of vulnerable populations with the physical ability to work. The NBSSS suggested that it be drawn up as a National Programme for Productive Social Action that should include initiatives from different sectors. The coordinating responsibilities of this component are shared between MGCAS and other ministries. The public works are identified and managed by district and municipal governments. Eligibility is determined on the basis of a mix of community, household, and individual criteria, and Mt 650 was paid per month to participants. This policy was renamed the productive social action programme (PSAP) in 2018. It is not simulated within MOZMOD v2.9.

Not strictly benefit 4 (*Electricity tariff reduction)*: This policy was introduced to support low-income people in 2020 during the COVID-19 pandemic. The support comprised a 50 per cent reduction in tariff for those on the 'social tariff' (using 0–125kw/hr at 1.07 Mt per kw) for the period of June to end December 2020.

1.3 Social contributions

Social insurance contribution 1 (*Segurança Social para os trabalhadores do sector privado*): This social insurance programme is for individuals employed by the private sector or not-for-profit organizations and is managed by the National Institute of Social Security (*Instituto Nacional de Segurança Social*, NISS), which operates under the authority of the Ministry of Labour. The global rate of contributions is fixed at 7 per cent of gross income, of which 4 per cent is paid by the employer. Self-employees contribute 7 per cent of remuneration. Currently, the social security programme assigns the following benefits: (i) sickness grants, (ii) death grants, (iii) funeral allowance, (iv) old-age pension, (v) disability pension, (vi) survivor's pension, (vii) old-age allowance, (viii) hospitalization allowance, and (ix) maternity allowance. People covered by the Mozambican system remain eligible when they work abroad (paragraphs 1 and 2 of Article 04, Law No. 05/89 of 18 September).

Social insurance contribution 2 (*Previdência Social para Funcionários de Aparelho do Estado*): This social insurance programme for employees in the public sector is currently governed by Decree No. 27/2010 of 12 August, which regulates the matter of social security in the civil service. The following benefits exist: (i) survivor's pension, (ii) so-called blood pension, (iii) allowance for death, (iv) extraordinary retirement for military, (v) retirement for old age or disability, (vi) medical and drug assistance for state employees, (vii) maternity leave, and (viii) licence in cases of chronic degenerative and mental illnesses. Civil servants contribute 7 per cent of their gross income. Pensions for people working in defence and security are mainly governed by Decree No. 3/86 of 25 July, approving the Regulation of Social Security and Reform of the Armed Forces of Mozambique. The process is part of a bisectorial structural relationship between the Ministry of Economy and Finance (MEF) and the Ministry of National Defence. The payments are made in relation to: (i) retirement and invalidity pension, (ii) survivor's pension, (iii) death benefit, (iv) blood pension, and (v) pension for exceptional and relevant services to the country. The beneficiaries of this pension scheme are veterans of the liberation struggle and permanent staff from the defence sector and their family members.

1.4 Taxes

Five different taxes are simulated in MOZMOD. The main taxes are personal income tax (i.e. IRPS) and value-added tax (*Imposto sobre o Valor Acrescentado*, VAT). Personal income tax has five income categories (see Barnes et al. 2016: 5). For the purposes of simulating IRPS in MOZMOD, wages and salaries are simulated as one policy (Tax 1) and the other four categories of income are simulated as one policy (Tax 3); however, tax on the capital gains element of 'capital income' is not simulated.

Tax 1 (*Personal income tax: Employment*): This is a direct tax on employment income, that is, wages and salaries (GdM 2008a; PdM 2007d, 2013). It is applied at the individual level. From 2014 onwards, there are ten tax bands. An additional amount is applied which depends on the number of dependents and the tax band.

Tax 2 (*Personal income tax: Simplified tax* [Imposto Simplificado para Pequenos Contribuintes, ISPC]): This is a direct tax on small businesses earning annual gross revenue equal to or smaller than Mt 2.5 million (PdM 2009b). The annual tax value to be paid is Mt 75,000 or a 3 per cent tax rate on total annual income. This category captures the taxable personal income for self-employed individuals.

Tax 3 (*Personal income tax: Other income sources*): This is a direct tax on other personal sources of income such as large self-employment income and income from agriculture, property, interest, and other income (GdM 2008a; PdM 2007d, 2013).

Tax 4 (*VAT*): VAT is an indirect tax on expenditure at the rate of 17 per cent. Different rates apply for utilities such as diesel, piped water, unpiped water, and electricity. The law considers a 5 per cent rate

for economic agents under the simplified regime (but this has not been implemented within MOZMOD).

Tax 5 (*Excise tax* [Imposto sobre Consumos Especificos]): This is an indirect tax applied to domestic transactions and imports of goods considered as harmful for health or for higher-income earners and/or luxury goods such as tobacco, alcohol, and vehicles (Barnes et al. 2016; PdM 2009c). These taxes are defined as ad valorem and vary between 5 and 75 per cent.

Tax 6 (*Fuel tax* [Taxa sobre os Combustiveis]): This is an ad valorem tax levied on fuel for motor vehicles.

The other taxes in the Mozambican system that are not simulated in MOZMOD are corporate income tax (*Imposto sobre o Rendimento das Pessoas Colectivas*), customs duties, property registration, inheritance and gift, tax on gambling, tax on petroleum products, stamp duty, national reconstruction, fishing licences, property transfer, royalties and surface tax, and municipality taxes (personal, vehicle, property, contribution for infrastructure improvement, levies for issuing operating licences, tariffs and charges for the provision of municipal services) (ACIS et al. 2011b; Barnes et al. 2016; Bolnick and Byiers 2009).

2 Simulation of taxes and benefits in MOZMOD

2.1 Scope of simulation

Table 2.1 shows two benefit policies simulated in MOZMOD.

Table 2.1: Simulation of benefits in MOZMOD

	Variable name(s)	Treatment in MOZMOD								Why not fully simulated?
		2015	2016	2017	2018	2019	2020	2021	2022	
Direct social support programme	*bot_s*	S	S	S	S	E	E	E	E	Only food baskets are simulated (2015–18)
Basic social subsidy programme	*bsadi_s*	S	S	S	S	S	S	S	S	—
Acção Social Escolar	/	E	E	E	E	E	E	E	E	Requires further details on eligibility
Acção Social da Saúde	/	E	E	E	E	E	E	E	E	Requires further details on eligibility
Programa Acção Social Produtiva	/	E	E	E	E	E	E	E	E	Requires further details on eligibility
Electricity tariff reduction	*bsaho_z*	/	/	/	/	/	S	/	/	Only in place in 2020 for a limited period

Note: 'S' policy is *simulated* although some minor or very specific rules may not be simulated. 'E' policy is *excluded* from the model.

Source: Authors' compilation.

Table 2.2 represents six tax policies and two social contribution policies.

Table 2.2: Simulation of taxes and social contributions in MOZMOD

	Variable name(s)	Treatment in MOZMOD								Why not fully simulated?
		2015	2016	2017	2018	2019	2020	2021	2022	
Personal income tax										
Employment	*tin_s*	S	S	S	S	S	S	S	S	
Simplified tax	*ttn_s*	S	S	S	S	S	S	S	S	
Other income sources	*tin00_s*	S	S	S	S	S	S	S	S	
Value-added tax										
Value-added tax	*tva_s*	S	S	S	S	S	S	S	S	No information is available to enable the implementation of the 5% VAT rate
Excise duty and fuel tax										
Excise duty	*tex02_s tex03_s tex_s*	S	S	S	S	S	S	S	S	
Fuel tax	*tfl_s*	S	S	S	S	S	S	S	S	
Social insurance contribution										
Private sector (not self-employed)	*tscee_s, tscer_s*	S	S	S	S	S	S	S	S	
Public sector	*tscee02_s*	S	S	S	S	S	S	S	S	
Private sector (self-employed)	*tscee03_s*	S	S	S	S	S	S	S	S	

Note: '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 presents the order of the main elements of the Mozambican system for 2015–22 for simulations.

Table 2.3: MOZMOD spine: order of simulation

Policy	MZ_2015	MZ_2016	MZ_2017	MZ_2018	MZ_2019	MZ_2020	MZ_2021	MZ_2022	Description of the instrument and main output
uprate_mz	On	On	On	On	On	On	On	On	DEF: Uprating factors
neg_mz	On	On	On	On	On	On	On	On	DEF: Recode negative income to zero
lma_mz	Off	Off	Off	Off	Off	On	On	Off	DEF: Labour market adjustments due to COVID-19
ildef_std_mz	On	On	On	On	On	On	On	On	DEF: Standard income lists
ildef_non_std_mz	On	On	On	On	On	On	On	On	DEF: Model specific income lists
ildef_stats_mz	On	On	On	On	On	On	On	On	DEF: Stats Presenter income lists
ildef_exp_mz	On	On	On	On	On	On	On	On	DEF: Expenditure income lists (COICOP)
tudef_mz	On	On	On	On	On	On	On	On	DEF: Assessment units
constdef_mz	On	On	On	On	On	On	On	On	DEF: Constants
random_mz	On	On	On	On	On	On	On	On	DEF: Random number generator to dampen bot_s (DSSP) in 2015–18; and bsadi_s (BSSP) in 2019.
spl_mz	On	On	On	On	On	On	On	On	INC: On model poverty lines
ses_mz	On	On	On	On	On	On	On	On	INC: On model equivalence scales
sic_mz	On	On	On	On	On	On	On	On	SIC: *Segurança Social* (private sector)
sic01_mz	On	On	On	On	On	On	On	On	SIC: *Previdencia Social* (public sector)
tin_mz	On	On	On	On	On	On	On	On	TAX: Personal income tax: Employment
ttn_mz	On	On	On	On	On	On	On	On	TAX: Simplified (a turnover tax)
sic02_mz	On	On	On	On	On	On	On	On	SIC: *Segurança Social* (self-employed)
tin00_mz	On	On	On	On	On	On	On	On	TAX: Personal income tax: Other income sources
bot_mz	On	On	On	On	Off	Off	Off	Off	BEN: Direct SSP
bsadi_mz	On	On	On	On	On	On	On	On	BEN: Basic SSP
bsaho_mz	Off	Off	Off	Off	Off	On	Off	Off	BEN: Electricity tariff reduction
tva_mz	On	On	On	On	On	On	On	On	TAX: Value-added tax
tex_mz	On	On	On	On	On	On	On	On	TAX: Excise duty
tfl_mz	On	On	On	On	On	On	On	On	TAX: Fuel tax
xhhadj_mz	On	On	On	On	On	On	On	On	INC: Adjust consumption to new disposable income
output_std_mz	On	On	On	On	On	On	On	On	DEF: Standard output individual level
output_std_hh_mz	Off	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.

Source: Authors' compilation.

2.3 Policy switches

This MOZMOD version has policy switches for DSSP (2015–18) and BSSP (2019–22) which adjust the simulations of these two benefits downwards (see validation section).

In addition, a full-year adjustment (FYA) policy switch is applied to two COVID-related policies in 2020, namely the temporary electricity tariff reduction and Basic SSP that was augmented during the pandemic.

The electricity tariff reduction modelled in the 2020 policy system was in place only for the duration of seven months during the 2020 calendar year. MOZMOD however generally simulates policies at a specific point in time, which is problematic when considering policies of limited duration. Using the standard point-in-time approach, the tariff reduction would be assumed to be effective throughout the whole calendar year. In MOZMOD v2.10, this is accounted for by applying 'full-year adjustment' to this policy. This ensures that the relevant fee reduction is scaled to reflect the number of months that the policy was available during the 2020 calendar year. The adjustment is applied by incorporating an extension switch called 'Full Year Adjustment' (FYA) to the policy. The FYA switch is set 'on' by default in the 2020 policy system. See Gasior et al. (2021) for details.

The FYA policy switch is also applied to the BSSP policy in the 2020 policy system, reflecting augmented payment amounts, equivalent to two months of usual payment, during the COVID-19 pandemic.

Note that income shocks from COVID in 2020 ('lma_mz' policy described in Section 3.2) and the FYA switch for COVID-related policies in 2020 should generally be switched either 'on' or 'off' together. When both are 'on', the model reflects the situation with economic shocks from COVID-19 and the mitigating impact of COVID-related policies, covering the entire calendar year of 2020. The user is free to use alternative modelling assumptions, such as simulating the effects of the pandemic without the mitigating impact of COVID-related policies in 2020.

More details on the modelling of the two COVID-related policies are available in the dedicated sub-sections (1.2, 2.4.2, and 2.4.3). Section 3.2 describes the 'on-model' adjustment of incomes during the pandemic.

Lastly, there is also a switch to adjust the simulations of simplified tax for selected years (2015 and 2019) downwards. This is switched off but could be applied or extended to additional years by the user if wished.

2.4 Social benefits

2.4.1 Direct social support programme (bot_s)

The DSSP is a sub-programme of the DSA. It consists of in-kind subsidies, usually food boxes, for a fixed period in response to various situations of vulnerability.

Definitions (applicable only to 2015–18 inclusive)

Child-headed households: aged 12–17 years, inclusive.

Elderly: aged 55+ years if female or 60+ years if male.

Acute malnutrition: insufficient weight to height for children below 5 years of age.

Dependent children: children aged below 18 years.

Eligibility conditions (applicable only to 2015–18 inclusive)

There is a three-stage screening process. First, target groups are identified consisting of the following groups (for 2015 to 2018 inclusive):

- Child-headed households;
- Households containing someone with a chronic and degenerative disease in bedridden condition;
- Households containing at least one child aged below 5 years recovering from acute malnutrition;
- Households whose working-age members all have temporary incapacity for work up to a maximum of 18 months;
- Individuals in the process of social and family reintegration at the moment of reuniting with the family;
- Individuals suffering from HIV/AIDS under anti-retroviral treatment up to 6 months;
- Malnourished pregnant women.

Second, a residence test is undertaken as follows:

- The applicant must be a resident at the location where s/he is requesting assistance and must be confirmed to be such by the local administration authority. The means of verification is a statement from the local administration authority and a visit to the residence.

Third, an income test is undertaken (see below, applicable only to 2015–18 inclusive).

Income test (applicable only to 2015–18 inclusive)

The income test takes into account income from wages and remunerations, or self-employment business, or pension fund. Means of verification include an income statement from the employer, expenditure receipts, and a pensioner identity card. In the case of self-employment income, other indicators could be used to estimate the income level: type of activity, period of work, quantity of output, revenues, profits, and prices.

A two-stage means test is applied first at the level of the individual and then at the level of the household. The income of the applicant has to be equal to or lower than one-third of the national minimum wage; this same criterion is applied to the household by dividing the household-level income by the number of people in the household.

Minimum wages for certain sectors are issued every year by the Ministry of Labour based on tripartite negotiations of the Labour Consultative Council. The sector of 'public administration, including the defence and security forces' is used for calculations. The income test was set at Mt 1,061 per month in 2015, Mt 1,099.33 per month in 2016, and Mt 1,332 per month in 2017 (INE 2017: 105; WageIndicator Foundation 2017).

Benefit amount and duration (applicable only to 2015–18 inclusive)

The benefit is usually provided in the form of food kits. However, this programme can comprise in-kind supply of other goods and services required by a specific household, such as repairs to the house or the costs of medication.

For the years 2015–18 inclusive, provision of monthly food kits depended on household size. The average amounts for 2015, 2016, 2017, and 2018 were as follows:

- One person in household: Mt 630 per month;

- Two to three people in household: Mt 1,390 per month;
- Four or more people in household: Mt 2,385 per month.

The DSSP usually runs for a period of two years but may run for longer if a child heads the household or if a child suffers from chronic malnutrition.

MOZMOD notes

Using the Household Budget Survey (*Inquérito ao Orçamento Familiar*, IOF) it was not possible to identify the last three target groups (reuniting families, people on anti-retroviral treatment, and malnourished pregnant women) for the years 2015–18 inclusive.

As the state of having a 'chronic and degenerative disease and being in a bedridden condition' is not measured in the IOF, this category was identified by selecting people defined as being 'paralytic' in the IOF. This significantly underestimated the number of people in this target group for the years 2015–18 inclusive.

The residence test could not be applied in MOZMOD.

The average values of food kits were assigned to households identified as eligible in MOZMOD, on the basis of the household size for the years 2015–18 inclusive.

As the simulated cost of the programme far exceeded the actual expenditure on the programme (based on the external validation data), a switch was introduced in this policy which randomly restricted the allocation until the simulated cost of the programme corresponded to the actual expenditure for the year 2016 for the years 2015–18 inclusive.

Following the revisions to DSSP in 2018 (Decree No. 47/2018 of August 6), the policy contains two components: i) the so-called 'Multiform Support' comprising not just the food basket, but also some housing compensation, and breast milk substitutes if needed; ii) and social transfers following an emergency such as a natural disaster. As only the food basket was simulated in the DSSP in MOZMOD, and the eligibility criteria for these had been narrowed, the policy was switched off in the 2019–20 systems of MOZMOD v2.9.

2.4.2 Basic social subsidy programme (bsadi_s)

The BSSP is a sub-programme of the DSA. This programme was called the 'food subsidy programme' (*Programa Subsídio de Alimentos*) until 2010 and had run since 1990 (IPC-UNDP 2016). The focus of the programme in 2015–19 was on low-income households with a household member who is permanently unable to work due to age, chronic illness, or disability, but this focus was broadened in scope when the policy was revised, as reflected in the 2019 system. The BSSP is in operation in all districts and administrative posts in the country, but there are geographical gaps in coverage.

Definitions (applicable only to 2015–18 inclusive)

Elderly: aged 55+ years if female or 60+ years if male (RdM 2002).

Permanent incapacity for work: this reflects a situation that will not change, and can be the result of a chronic illness, accident, or disability.

Deficiencies: this applies to someone who, because of congenital or acquired anatomical, physiological, sensory, or mental anomalies, is at a disadvantage or unable, through physical and/or social barriers, to undertake normal activities (RdM 2009).

For a person to be considered as having a chronic or degenerative disease they need a medical certificate. This categorization is applied to five clinical situations:

- Hypertension (>140/95) in need of permanent medication control with antihypertensive and/or diuretics;
- Any type of epilepsy that requires permanent anti-epileptic medication;
- Patients suffering from periodic bouts of asthma who cannot afford anti-asthmatic medication;
- Chronic renal failure characterized by blood levels of creatinine (>134 Hmol/l) and the need for ongoing medication due to complications such as anaemia and hypertension;
- Diabetes mellitus characterized by high glucose blood levels and patients who cannot afford medication for treatment.

Eligibility conditions (applicable only to 2015–18 inclusive)

There is a three-stage screening process. First, target groups are identified consisting of the following groups (for 2015–18):

- Elderly with permanent incapacity for work, living alone, or heading a family in need of support;
- Individuals with deficiencies who have a permanent incapacity for work, who are aged 18+ years, and are living alone or heading a family in need of support;
- Individuals with chronic and degenerative diseases who are not bedridden but have a permanent incapacity for work, who are aged 18+ years, and are living alone or heading a family in need of support.

The revised policy has a broader set of target groups comprising (for 2019–22):

- Elderly with permanent incapacity for work;
- Disabled people unable to work;
- People with a chronic and degenerative disease, permanently bedridden;
- Malnourished children aged 0–2 inclusive;
- Orphans aged 14–18 inclusive heading the household;
- Orphaned children living in poverty.

Second, a residence test is undertaken as follows:

- The applicant must have been resident at the location where s/he is requesting assistance for more than 6 months and must be confirmed to be such by the local administration authority. The means of verification is a statement from the local administration authority.

Third, an income test is undertaken (see below).

Income test

As with DSSP, the income test for BSSP takes into account income from wages and remunerations, self-employment business, or pension fund. Means of verification include an income statement from the employer, expenditure receipts, and a pensioner identity card. In the case of self-employment income, other indicators could be used to estimate the income level, including type of activity, period of work, quantity of output, revenues, profits, and prices.

A two-stage means test is applied first at the level of the individual and then at the level of the household. The income of the applicant has to be lower than one-third of the national minimum wage; this same criterion is applied to the household by dividing the household-level income by the number of people in the household.

Minimum wages for certain sectors are issued every year by the Ministry of Labour based on tripartite negotiations of the Labour Consultative Council. As with DSSP, the sector of 'public administration, including the defence and security forces' is used for calculations.

Benefit amount

Household monthly subsidy values received in 2015–18 inclusive (INAS 2015) were as follows:

- One person in household: Mt 310 per month;
- Two people in household: Mt 390 per month;
- Three people in household: Mt 460 per month;
- Four people in household: Mt 530 per month;
- Five or more people in household: Mt 610 per month.

Following the change to the policy in 2018, the household monthly subsidy received also changed in 2019 (ongoing) to:

- One relevant person in household: Mt 540 per month;
- Two relevant people in household: Mt 640 per month;
- Three relevant people in household: Mt 740 per month;
- Four relevant people in household: Mt 840 per month;
- Five relevant or more people in household: Mt 1000 per month.

The total number of relevant people is calculated as the total number of people of all ages in the household minus the number of women aged 18–54 inclusive and men aged 18–59 inclusive with the capacity to work.

In 2020 the payment amount was augmented to provide additional support (equivalent to two months of usual payment) due to the COVID-19 pandemic.

MOZMOD notes

Proxies had to be constructed for the 'chronic and degenerative diseases but not bedridden' status and for people with 'deficiencies with permanent incapacity to work', using information from the IOF. The IOF did not contain sufficiently nuanced sickness/disability questions to enable these proxies to be very precise.

Permanent incapacity for work for those aged 55+ years (female) or 60+ years (male) was identified using a broader proxy flag.

The residence test could not be applied in MOZMOD.

A switch was included to dampen the number of simulated beneficiaries of BSSP in 2019–20 in order to more closely align with the actual expenditure on this benefit, for 2019.

The augmented payment was included in 2020 in the model as part of the FYA switch.

2.4.3 Electricity tariff reduction (bsaho_s)

This policy was introduced to support low-income people in 2020 during the COVID-19 pandemic. The support comprised a 50 per cent reduction in tariff for those on the 'social tariff' (using 0–125kw/hr at 1.07 Mt per kw) for the period of June to end December 2020.

MOZMOD notes

This policy was included in 2020 in the model as part of the FYA switch, where it is adjusted to be available for seven months only.

2.4.4 Employee social contributions: 'Social insurance contribution' (private or not-for-profit organizations)

Liability to contributions

Employees of any private company or of a not-for-profit organization have to be registered at NISS in order to contribute to the pension fund.

Income base used to calculate contributions

Gross monthly income is the basis for calculating the contributions for the pension fund. There is no upper limit cap.

Contribution rates

Each employee should contribute 3 per cent of his/her own gross monthly salary.

2.4.5 Employer social contributions: 'Social insurance contribution' (private or not-for-profit organizations)

Liability to contributions

Any private company or not-for-profit organization has to register employees at NISS in order to contribute to the pension fund.

Income base used to calculate contributions

Gross monthly income of the employee is the basis for calculating the contributions for the pension fund.

Contribution rates

Employers should contribute 4 per cent of the employee's gross monthly salary.

2.4.6 Self-employed social contributions: 'Social insurance contribution'

Liability to contributions

Self-employed individuals can register at NISS to contribute to the pension fund.

Income base used to calculate contributions

Gross monthly income is the basis for calculating the contributions for the pension fund.

Contribution rates

Each self-employed individual registered at the NISS should contribute 7 per cent of his/her own gross monthly income.

2.4.7 Employee social contributions: 'Social insurance contribution' (public sector)

Liability to contributions

Employees in the public sector must contribute to the pension fund.

Income base used to calculate contributions

Gross monthly income is the basis for calculating the contributions for the pension fund. There is no upper limit cap.

Contribution rates

Each employee should contribute 7 per cent of his/her own gross monthly salary.

2.5 Personal income tax

2.5.1 Tax unit

Individuals residing in Mozambique or receiving income in this country are liable to personal income tax on their worldwide income.

The tax unit became the individual for the purposes of taxable income calculations from 2014 onwards (PdM 2013). Nevertheless, the tax calculations take into account the presence of dependents within the family (elaborated below). All other income earners in a family have their taxes calculated and paid individually.

For the period before 2014, income tax for a couple was calculated jointly (ACIS et al. 2011a; PdM 2007d). All other income earners in the family had their taxes calculated and paid individually; that is, the individual was the tax unit.

MOZMOD notes

For personal income tax from employment: it is applied at the individual level, with reference to a dedicated definition of the family (defined in the model as a tax unit called 'family 2') in order to take into account amounts linked to the number of dependents of that taxpayer.

For personal income tax from other income sources: again, this policy is applied at the level of the individual, with reference also to the number of dependents of that taxpayer (family 2).

2.5.2 Exemptions

Following Verbist (2004), we define exemptions as 'income components (that) are part of pre-tax income, but do not have to be declared to the tax authorities, and thus are not included in the concept of taxable income (e.g. child benefits in most countries)'.

From 2014 onwards, pension and death subsidies are not subject to personal income tax (PdM 2013: Clause 7).

2.5.3 Tax allowances

In 2015, there were no tax allowances. Before 2014, taxable income was deducted in the following situations (Barnes et al. 2016; PdM 2007d):

- Employment income was deductible by the amount of labour union contributions and compensation by employee to employer when terminating unilaterally the employment contract.
- The following contributions were deducted from taxable income:
    a Pension, invalidity, or survival;
    b Social benefits and leisure activities;
    c Professional training.

2.5.4 Tax base

The Mozambican IRPS law considers five income categories:

- Wages and salaries;
- Income from companies and professional activities, including from self-employment;
- Capital income and gains, including distributed interests and profits, revenues from property sales;
- Real estate income, including property rents;
- Other sources of income like lottery.

From 2014 onwards, the tax base is defined for the following three cases:

Personal income tax base 1: Employment personal income tax

Tax base is defined as the income from dependent work minus the lower limit at a given tax band.

Personal income tax base 2: Self-employment personal income tax (simplified tax)

Tax base is defined as the gross revenue (turnover) below a threshold of Mt 2.5 million.

Personal income tax base 3: Other personal income tax

Tax base is defined as the sum of all other income sources minus a non-taxable minimum value of Mt 225,000 per year.

Other income includes non-agricultural self-employment income from large producers (industry and commerce), agricultural self-employment income from large producers, income from capital including interest, property income excluding land, and all other income sources such as lottery.

Note that Clause 54 of the IRPS Law No. 33/2007 mentions the marginal tax rates ('Other personal income tax' case for 2015). However, the templates available to the public to calculate the tax liability, and the formula for the calculation of 'Employment personal income tax' case for 2015 indicate that the calculation is done by applying only one tax rate for the respective tax band (Fumo 2012: 116).

Tax schedule

Tax schedule for 2015–22

Income tax schedule 1: Employment personal income tax

Table 2.4 shows the income tax schedule for personal income tax (employment).

Table 2.4: Income tax schedule 1: employment personal income tax

Gross monthly taxable income, in Meticais (intervals)	IRPS value to be retained, according to number of dependent family members (Meticais)					Tax rate (coefficient)
	0	1	2	3	≥4	
≤20,249	—	—	—	—	—	—
20,250–20,749	0	—	—	—	—	0.10
20,750–20,999	50	0	—	—	—	0.10
21,000–21,249	75	25	0	—	—	0.10
21,250–21,749	100	50	25	0	—	0.10
21,750–22,249	150	100	75	50	0	0.10
22,250–32,749	200	150	125	100	50	0.15
32,750–60,749	1,775	1,725	1,700	1,675	1,625	0.20
60,750–144,749	7,375	7,325	7,300	7,275	7,225	0.25
≥144,750	28,375	28,325	28,300	28,275	28,225	0.32

Notes: 'Tax rate (coefficient)' means that the value of 0.10 in the table represents a 10 per cent tax rate; '—' represents 'not applicable' (for an explanation of the latter, see PdM 2013).

Source: PdM (2013).

Income tax schedule 2: Self-employment personal income tax (simplified regime)

Self-employment agents earning an amount equal to or less than Mt 2.5 million are taxed at a single rate of 3 per cent per year.

Income tax schedule 3: Other personal income tax

Table 2.5 shows the income tax schedule for personal income tax (other).

Table 2.5: Income tax schedule 3: other personal income tax

Gross annual taxable income, in Mt (intervals)	Tax rates (%)	Rebate (Mt)
0–42,000	10	—
42,001–168,000	15	2,100
168,001–504,000	20	10,500
504,001–1,512,000	25	35,700
>1,512,000	32	141,540

Note: '—' represents 'not applicable' (for an explanation, see PdM 2013).

Source: PdM (2007d).

2.6 Indirect tax

2.6.1 VAT

Tax unit

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

Exemptions

VAT-exempted transactions are summarized here (Barnes et al. 2016; GdM 2008b; PdM 2007e, 2009d, 2012b).

Health-related transactions:

- Health and sanitary services provided in hospitals, health centres, and related facilities;
- Provision of health equipment to patients;
- Transmission of human organs, blood, and milk;
- Transportation of patients;
- Provision of mosquito nets;
- Provision of medicines.

Provision of goods and services by public or not-for-profit entities:

- Social assistance and provision of related goods;
- Security services;
- Care services for children, people with deficiencies, and elderly;
- Artistic and sports activities;
- Visits to museums, parks, and similar sites;
- Spiritual assistance;
- Activities developed by associations of various natures.

Education and professional training services:

- General education services;
- Professional training;
- Personal training.

Other services:

- Bank and financial services;
- Housing renting (residential);
- Renting for commercial, manufacturing, and other service activities in rural areas;
- Insurance and related services.

Provision of goods and services related to agricultural, forestry, livestock and fishing activities, including basic transformation developed at production areas, are also VAT exempted.

Transactions of other goods and services that are VAT exempted:

- Gambling and social entertainment;
- Cultural and artistic activities;
- Maize flour, rice, bread, iodate salt, powder milk for babies up to 1 year of age, wheat, wheat flour, natural or frozen tomato, potato, onion, frozen horse mackerel, illumination oil, jet fuel, common bicycles, and condoms;

- Transactions of military equipment and materials for the army;
- Transactions of feed products, including raw materials for feed production;
- Transactions of equipment, seed, fertilizers, and all production inputs (see list in Annex 1 of PdM 2007e);
- Transactions of medicines for livestock;
- Stamps to be used by the post office services;
- Public garbage services;
- Funeral and cremation services.

Transactions of goods and services that were VAT exempted until 31 December 2015:

- Sugar;
- Raw materials, intermediate goods, equipment, parts, and spare parts utilized in sugar production;
- Edible oil and soaps;
- Other products resulting from the activity developed by edible oil and soap producers;
- Raw materials used by edible oil and soap industries;
- Transactions of goods and services related to agricultural production of sugar cane for the industry.

VAT exemptions on imports are listed in the laws and regulations (GdM 2008b; PdM 2007e, 2012b). Exports of goods and services, similar transactions, and international transportation using national territory are VAT exempted. Special customs and fiscal regime (e.g. for rapid development zones, industrial free zones, and special economic zones) and extraction of mineral resources, natural gas, and oil are regulated in specific legislation.

Special cases regarding taxable income, for VAT purposes, include:

- Fuel products, the 'tax on fuel' is not included in taxable income;
- Electric energy, taxable income is calculated on 62 per cent of invoice value;
- Aeronautical taxes, taxable income is calculated on 85 per cent of invoice value;
- Roads, bridges, water supply infrastructure, and rural electricity construction and rehabilitation public works, 60 per cent is deducted from the tax value;
- Diesel, 50 per cent of the tax value is deducted.

Tax base

VAT is applied to transactions of goods and services in the national territory and to imports.

Tax schedule

The VAT rate is 17 per cent (GdM 2008b; PdM 2007e, 2009d, 2012b).[5] Economic agents under the simplified tax regime are taxed at a rate of 5 per cent. VAT is applied both on domestic transactions and on imports. There are also separate VAT rates for piped water, unpiped water, electricity, and diesel.

MOZMOD notes

It was not possible to simulate the 5 per cent VAT policy for economic agents under the simplified tax regime.

[5] **The standard rate of VAT was reduced to 16 per cent in January 2023.**

2.6.2 Excise duty

Tax unit

The tax unit is the household. Excise duty is simulated on purchases of certain goods.

Tax base and schedule

A simplified list of goods is presented here for each level of excise tax rate (for details, see PdM 2009c):

- 5 per cent: electric spark vehicles with engine cylinders between 1,000 and 1,500 cm^3, diesel and semi-diesel vehicles with engine cylinders with less than 1,500 cm^3;
- 10 per cent: roots and tuber beer;
- 15 per cent: cheap costume jewellery, special vehicles for golf fields and similar uses, motorcycles with engine cylinders between 250 and 500 cm^3, trailers for housing or camping, flowers and related articles made of plastic or other materials, shampoos, coins not in use;
- 30 per cent: feed for cats and dogs, perfume, eau de toilette, cosmetic products for the skin, lacquer and similar products, after-shave, bath minerals, deodorants, garments made of animal skin, cargo vehicles, guns and rifles including of air and gas, paintings, drawings, pictures, sculptures, antiques older than 100 years;
- 35 per cent: vehicles for transporting 10 or more passengers, electric spark vehicles with engine cylinders between 1,500 and 3,000 cm^3, diesel and semi-diesel vehicles with engine cylinders with more than 1,500 cm^3, motorcycles with engine cylinders more than 500 cm^3, balloons, airships, dirigibles, wings, yachts, motor boats, canoes, kayaks;
- 40 per cent: malt beer, cider and similar drinks, non-denatured ethyl alcohol (more than 80 per cent volume), electric spark vehicles with engine cylinders more than 3,000 cm^3;
- 50 per cent: pearls, diamonds, precious and semi-precious stones, synthetic stones, common metals covered with layers of silver, gold, platinum and related materials, common metals, silver or gold covered with a platinum layer, metallic jewellery, metallic goldsmithing;
- 55 per cent: wine, vermouth, liqueur, other alcoholic drinks (with less than 8.5 per cent volume);
- 65 per cent in 2015 and 2016, increasing to 75 per cent in 2017: denatured ethyl alcohol (more than 80 per cent volume), non-denatured ethyl alcohol like whisky, rum, gin, vodka, etc. (less than 80 per cent volume);
- 75 per cent: cigars, cigarettes, tobacco.

VAT is applied after inclusion of the excise duty amount.

MOZMOD notes

Excise duty is simulated for a subset of items in MOZMOD that were selected to represent common and regular household expenditure items. The items included are beer, wine, spirits, and tobacco products.

2.6.3 Fuel tax

Tax unit

The tax unit is the household. Fuel tax is simulated on purchases of certain types of fuel.

Tax base and schedule

Fuel tax is levied on a per-litre basis and is then subject to VAT. The 2015 levies were 7.21 Mt/litre of petrol and 4.27 Mt/litre of diesel. These rates remained unchanged until April 2022 when—due to the high cost of fuel in the international market and its impact on the domestic economy—each tax was

reduced by four percentage points respectively, from April to December 2022 (Ministries of Economy and Finance and Mineral Resources and Energy 2022).

MOZMOD notes

Fuel tax is simulated in MOZMOD for petrol and diesel fuels for motor vehicles.

3 Data

3.1 General description

The MOZMOD database is drawn from IOF 2014–15.[6]

IOF 2014–15 was planned as a panel with four quarters straddling the two years 2014 and 2015. In the event, the third quarter was not completed, and data have been provided only for the first, second, and fourth quarters which, for the sake of clarity, have been identified as T1, T2, and T4, respectively. Eleven files for each time point were provided. The original sample that was drawn for T1 was revisited at time points T2 and T4. There was no substitution to take into account attrition, and if individuals left the original household either to form a new household or to join an existing non-sampled household they were not followed up.

Table 3.1 specifies the data collection times for the four quarters, although due to administrative difficulties the third quarter was not completed.

Table 3.1: The four quarters (or trimesters) of IOF 2014–15

IOF quarters	Data collection		Number of days
	Start	End	
1st quarter	07-08-2014	07-11-2014	92
2nd quarter	17-11-2014	17-02-2015	91
3rd quarter	17-02-2015	17-05-2015	91
4th quarter	17-05-2015	15-08-2015	91

Source: INE (2015).

The original plan had been to create the input dataset by separately preparing T1, T2, and T4 data. These files would then be appended, the weights would be adjusted, and sequential *idhh*, *idperson*, and other ID variables would be created. However, having prepared the three datasets it was found that dataset T4 was problematic as there are a substantial number of cases in the base data file that lack certain demographic information and other data which are crucial to the functioning of the model.

The final decision was to proceed with T1 and T2 only. It had been anticipated that having prepared the syntax for T1, the syntax for the following waves of data would have been straightforward. Unfortunately, although this was generally the case, it was found that variable naming conventions varied somewhat between waves. This was particularly problematic for expenditure data where different codes for Classification of Individual Consumption According to Purpose for income and expenditures (known as COICOP codes) were used in different waves. This resulted in some difficulties in preparing the policies for modelling VAT and excise duty. Some adjustments were made to codes

[6] Earlier versions of MOZMOD were underpinned by IOF 2008–09.

relating to excise dutiable items in order to harmonize the codes. For other items, the different codes are all retained and classified in the model according to the appropriate rate of VAT.

The IOF 2014–15 sample is a sub-sample of the master sample (*Amostra Mãe*), developed by INE from the 2007 Mozambique Census of Population and Housing (*Recenseamento Geral da População e Habitação*) (see Table 3.2). This master sample is designed to serve the programme of national household surveys during the intercensal period.

Table 3.2: MOZMOD database description

MOZMOD database	Mz_2015 data
Original name	*Inquérito ao Orçamento Familiar*
Provider	National Institute of Statistics (*Instituto Nacional de Estatística*, INE)
Year of collection	2014 and 2015
Period of collection	See Table 3.1 for each trimester
Income reference period	All incomes adjusted by the MOZMOD team to June 2015

Source: Authors' compilation.

IOF 2014–15 was designed to follow a non-rotating panel system for both strata, that is, each sample household would be questioned four times during the full cycle (one cycle = 12 months) and during the 4 weeks of a month (i.e. following the 4×4 rule).

The sample was randomized and stratified, and the sampling methodology involved three stages of selection:

- At the first sampling, 1,236 primary sampling units (PSUs) were selected systematically with probability proportional to size (PPS) of aggregates family per stratum in each province.
- At the second stage, one enumeration area was selected with PPS within each PSU.
- At the third stage, 15 households were selected in the urban stratum and 12 in the rural area. Of these 15 or 12 households, 4 were selected as reserves.

The PSUs in the master sample were stratified by province, urban areas, and rural areas. The urban stratum of each province was further divided into substrata consisting of cities and other urban areas.

Table 3.3: Selected and interviewed family aggregates by provinces in Mozambique, 2014–15

Province		Coverage of listing areas					
	Sample	Real. I QUARTER	%	Real. III QUARTER	%	Real. IV QUARTER	%
Niassa	900	863	95.9	775	86.1	822	91.3
Cabo Delgado	964	957	99.3	855	88.7	841	87.2
Nampula	1,492	1,460	97.9	1,367	91.6	1,354	90.8
Zambézia	1,564	1,549	99	1,035	66.2	1,296	82.9
Tete	984	982	99.8	890	90.5	933	94.8
Manica	888	888	100	850	95.7	834	93.9
Sofala	1,012	986	97.4	979	96.7	985	97.3
Inhambane	856	856	100	818	95.6	798	93.2
Gaza	824	822	99.8	796	96.6	788	95.6
Maputo province	1,044	1,043	99.9	1,007	96.5	989	94.7
Maputo City	1,100	1,074	97.6	988	89.8	972	88.4
Mozambique	11,628	11,480	98.7	10,360	89.1	10,612	91.3

Source: INE (2015).

Accordingly, for IOF 2014–15, 11,628 family aggregates were selected, distributed proportionally by the provinces of the country (Table 3.3). Of these, 6,380 were in urban areas and 5,248 were in rural areas. Excluded from IOF 2014–15 were all aggregate relatives and members residing in collective establishments, such as military barracks, homes, hospitals, chains, hotels, etc. Table 3.3 shows coverage.

Copies of the questionnaires are only available in Portuguese. Five questionnaires and an additional section on tourism in Mozambique (INE 2015) were used to collect the data, of which MOZMOD requires the first four:

1. *Questionário das Características Gerais do Agregado Familiar* (Family Household Questionnaire);
2. *Questionário das Despesas Diárias do Agregado* (Daily Expenses Questionnaire);
3. *Questionário das Despesas e Receitas (anuais e mensais)* (Annual and Monthly Expenses and Income Questionnaire);
4. *Questionário para pessoas de 5 anos e mais* (Questionnaire for People 5 Years Old and Over);
5. *Questionário Comunitário* (Community Questionnaire) (completed by the controller); this was used only in rural areas;
6. A module on tourism in Mozambique.

In relation to weaknesses of the data, it was very apparent during the data preparation phase that very little cleaning had been undertaken with regard to household codes and personal codes. This was particularly apparent between waves. However, as the waves were appended (rather than merged), the lack of a harmonious numbering system was less problematic than first anticipated. Scrutiny of the expenditure variables revealed that some items, particularly tobacco products and alcohol, were less extensively coded than in IOF 2008–09. Certain expenditure items also required imputation (see Section 3.2).

As was the case for IOF 2008–09, the income data have not been previously analysed as it is reportedly difficult to gather the information and the data are of low quality due to underreporting. It is difficult to determine whether this concern is any more than the usual apprehension about income data collected through surveys, particularly in developing countries. In any case, care should be taken when using the income data.

Lastly, with regard to IOF 2008–09, Tvedten et al. (2009) expressed concern about the definition of a household, stating that the survey:

> defines the household as people living under the same roof and eating from the same pot, which does not reflect the complex realities on the ground as we have experienced them. In particular, there are many household members who do not live under the same roof but 'eat from the same pot'—including 'split households' who maintain an urban and rural unit as part of their coping strategy. In Maputo in particular, there are also people who live under the same roof but do not 'eat from the same pot' and who are not members of the same household. (Tvedten et al. 2009: 10)

There is no reason to believe that the situation has changed.

3.2 Data adjustment

3.2.1 General data adjustments

No households/individuals were dropped from the original sample, so no adjustments needed to be made to the weights. Indeed, as has been noted, the fourth wave was much less robust with regard to

variables needed for the construction of the input dataset. Rather than large-scale deletion of cases and re-weighting, it was decided not to use this wave.

However, in several datasets it was still necessary to undertake data cleaning. For example, in the annual expenditure file some missing expenditure information had been given the value of 9,999,999,999, and other implausibly high expenditures needed to be capped at the 99th percentile.

Households are defined as people living under the same roof and eating from the same pot, and the household head is identified by the household. The survey provides information on each person's relationship to the household head and their biological father/mother (including ID numbers); therefore, it was possible to determine some relationships within the household.

Mother and father IDs (*idmother* and *idfather*) were created for children below 18 years using the biological mother and father ID variables. Where *idmother* or *idfather* was missing but the child was known to be the son/daughter of the head (using the 'relationship to head of household' variable), the child was assigned the ID number of the head of household for *idmother* (where a female head) or *idfather* (where a male head).

More specifically, for T1 (T2 figures in brackets for the whole of this section), the mother ID variable (*af09*) was missing for 28,923 (25,082) cases and coded 0 for 5,064 (4,395) cases (i.e. to signify no mother ID). However, of these cases, only 6,567 (5,563) were aged below 18 years, so the missing variable occurred mainly for older people. For 952 (880) of the 6,567 (5,563) cases with a missing mother ID, the cases were the son/daughter of the household head, and so were given the ID of the head of the household (for the mother ID) if the head was female. A further 117 (125) cases were given the ID of the head of the household if the head was female, as the cases were listed as stepchildren of the household head.

The father ID variable was missing for 30,747 (26,557) cases and coded 0 for 9,329 (8,236) cases. Of these cases with a missing father ID variable, 12,655 (10,872) were aged below 18 years. For these children, the father ID variable was assigned the ID of the head of the household where the head was male, and the child was listed as a son/daughter/stepson/stepdaughter of the household head.

Parent ID (*idparent*) was then created as *idmother* and if no *idmother* then *idfather*. The remaining 'loose' (i.e. unallocated) children were all assigned to the head of the household, except where the child was the household head—these 39 (29) cases were left unallocated, the youngest of whom was aged 14 (14) years. Of the 4,018 (4,352) unallocated children, 2,810 (2,424) were grandchildren of the head of the household, and 97 (85) were husbands or wives of the head of the household (mainly in their upper teens).

A new marital status variable was constructed which distinguished between people who were single, married (whether monogamous or polygamous), separated/divorced, and widowed. The original marital status variable *af07* had 22,064 (18,835)—39 per cent (37.9 per cent)—missing cases; however, on examination, all (all but 22) of these cases were aged below 18 years, and all (most) were aged 11 years or younger. All of those below 18 years with a missing marital status variable were imputed to be 'single'.

The compulsory variable *idpartner* posed a particular challenge in the dataset, because the household roster did not contain information on relationships between members of the household other than relationships to the household head. This means that the identification of partners for people other than the head (and their spouse) is a challenge. In the original dataset, there are two 'married' statuses—married/marital union, the latter includes polygamous marriages. For individuals aged 16 years and over, 3,256 (2,837) cases were married and 14,634 (12,866) cases were in a state of monogamous marital union. Of the 17,890 (15,703) married individuals, most—all but 2,803 (2,514)—could be assigned the ID of their co-resident spouse for the compulsory *idpartner* variable.

Extensive work was undertaken on the expenditure data in order to create an input dataset for indirect taxes. A total of 858 separate COICOP codes were identified from either the diary or the main expenditure sections of the questionnaire. Each of these had to be assigned a variable name ('*x*' followed by the COICOP code) and appropriate value labels. This was an extremely time-consuming activity.

Agricultural income data were captured in a different way in IOF 2014–15 than previously. In the new IOF, agricultural income data are captured as net profit (i.e. *yag*). However, for the purpose of simplified tax, agricultural turnover is required (i.e. gross receipts). In order to estimate gross receipts, a ratio was calculated using the previous IOF's data on gross receipts, turnover, and net profit.

A new methodology for modelling VAT and excise duties was introduced in the model in 2017. This involves removing VAT and excise duty (where applicable) from expenditure items at the point of preparation of the data 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*).

For the correct functioning of estimates of consumption poverty using the Statistics Presenter application within the model, an imputed income tax variable was imputed, and a number of other variables were constructed (see DRD[7]). Imputed direct taxes are required because direct tax information is not collected by the survey instrument. Because of the complexity of direct taxes in Mozambique, an innovative method was employed for the imputation process. First, the input dataset was completed without direct tax imputation. Second, the model (which was otherwise complete) was run in order to generate modelled taxes and employee social security contributions for 2015. Third, these modelled values were brought back into the input dataset to create the imputed variables tis and *tscee*. This methodology is more straightforward than trying to simulate the imputed taxes using STATA code. The same was undertaken for the benefits.

3.2.2 Income shocks resulting from the COVID-19 pandemic

Since MOZMOD v2.10 uses the Household Budget Survey from 2014/15 from before the pandemic, incomes in the 2020 and 2021 policy systems are not adjusted downwards automatically despite the economic shock resulting from the COVID-19 pandemic.

For the courtesy of the user, MOZMOD v2.10 contains a definitional policy called 'lma_mz', which applies relevant shocks to market incomes 'on-model' in 2020 and 2021. When the policy is set 'on' (default in the 2020 and 2021 policy systems), a portion of workers in each industry transitions from paid employment to unemployment with no 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 3.4 to randomly selected workers in each sector. The transition shares are derived from changes in each industry's GDP from its counterfactual value in 2020 and 2021, computed based on the pre-pandemic, 2017–19 linear trend (see Lastunen (2022) for details). 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. The reduction in output across the economy then approximates the loss of earned 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 2021 and deviated from pre-pandemic trends. Accordingly, the related labour market transitions and shocks apply to the entirety of years 2020 and 2021. It is

[7] The DRD for MOZMOD is available upon request from UNU-WIDER.

therefore recommended that, when running the model with the 'lma_mz' policy turned 'on', the user also turns 'on' the full-year adjustment switch for the temporary COVID-related policies in the 2020 system year (see Section 2.3). In this way, both the shocks and policies reflect the economic circumstances over the course of the whole year. When both are set 'off', the model reflects the point-in-time perspective for 2020 and 2021, not accounting for the pandemic or related policy changes. The user is free to use alternative modelling assumptions.

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 MOZMOD is based on several assumptions, equivalent in all SOUTHMOD models, that the user is free to amend.[8]

The COVID adjustment policy is switched 'off' in the policy system for 2022 due to lack of GDP data for 2022 at the time of writing. Subject to the availability of sectoral GDP data, future versions of MOZMOD will also introduce on-model shocks for the 2022 system year. Furthermore, updated individual-level survey data will become available in the future that can be used to underpin the model, making it possible to account for any future external shocks without separate on-model adjustments.

Table 3.4: Transition shares from paid employment to unemployment with no market income

Industry number (lindi00)	Industry	Transition share, 2020	Transition share, 2021
T1	Agriculture, forestry and fisheries	0	0
2	Extractive industries and mining	0.2026	0.2113
3	Manufacturing industry	0.0287	0.0291
4	Energy	0	0
5	Construction	0.0118	0.0103
6	Transport and communications	0.0540	0.0842
7	Trade and finance	0.0412	0.0422
8	Administrative services	0.1182	0.1297
9	Other services	0.0420	0.0448

Source: Authors' compilation.

3.3 Imputations and assumptions

3.3.1 Time period

The survey was undertaken between August 2014 and July 2015. Reference periods vary by type of question.

Information is captured on whether each individual aged 7 years and above has worked in the past 7 days. The survey captures the number of hours worked per week, the number of months worked in the last 12 months, the number of hours spent in the last 7 days doing different types of labour, and the number of hours spent on the previous day ('yesterday') doing housework.

Information on income is collected at the individual level and the income questions generally relate to the last month. Incomes have been deflated in the data preparation phase to June 2015.

[8] 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 3.5 lists the seven (for each time point) files that were combined in order to construct the initial dataset.

Table 3.5: List and description of the IOF dataset

Actual file name	Name used in report	Description
base_de_af_i_trimestre	Base data	This is a base individual- and household-level file. It contains demographic and other information at the individual and household level. All other datasets are appended to this.
base_emprego_i_trimestre	Labour market data	This is the dataset containing the labour market variables.
desnutricao_i_trim	Nutrition data	This is the dataset containing individual-level nutrition data (which is required for modelling social assistance).
base_de_receitas_i_trimestre_050716	Monthly income data	This dataset contains details of income received in the last month.
base_de_transfer_ncias_i_trimestre_050716	Transfers data	This dataset contains details of transfers, both paid and received, in the last month.
cons_real_ent	Consumption data	This contains the consumption data used for official consumption poverty line computation.
IOF_ponderadores_pontuais_despesas_final	Weights data	This file contains the final weights prepared by the Bureau of Statistics (both wave weights and annual weights)

Source: Authors' compilation.

The files *base_de_receitas_i_trimestre_050716* and *base_de_transfer_ncias_i_trimestre_050716* (see Table 3.5) together contain all the information necessary to construct the income variables (*yem, yse, yag, ytn, ypr, yprld, yiyot, yot, ypt*).

Information on expenditure/consumption is collected at the household level through a combination of diary and sections in the questionnaire. The diary data (relating to 1 week of expenditure) were stored in two files, *dd_i_trimestre_07012016* and *di_i*. Data collection took place during the period covered by each quarter as detailed earlier. Monthly and annual expenditures were collated through the questionnaire and the data stored in two files, *dm_i_trimestre_12012016* (monthly) and *base_bens_dur_veis_i_trimestre_02032016* (annual).

Consumption data, as used to construct the official consumption-based property lines, were stored in the file *cons_real_ent* (see Table 3.5).

3.3.2 Gross incomes

The IOF does not contain information about gross employment income. As was the case with IOF 2008–09, gross income was derived using a net to gross ratio for employment income within the IOF. This involved computing net income for a series of gross incomes using the information on tax bands, tax rates, and the presence of dependents in the family (so reverse engineering the tax system). Grossing up factors were calculated accordingly for various income bands.

Specifically, a spreadsheet was constructed of hypothetical monthly gross employment incomes ranging from Mt 20,000 per month to Mt 270,000 per month in intervals of Mt 10,000 (or less). Net incomes were calculated for these figures, assuming an average number of dependents, which was derived from the IOF for groups of (net) income bands of those in employment. In practice, there was very little variation although the higher-income groups had only an average of one dependent compared with two dependents for most other income groups and three dependents for the very

lowest band. Once the net incomes had been derived for these hypothetical monthly gross employment figures, grossing up factors were calculated for bands of net income (see Table 3.6).[9]

Table 3.6: IOF net employment income data: grossing factors

Net income range (Mt per month)	Grossing factor
20,000–28,999	1.0221
29,000–51,999	1.1271
52,000–79,999	1.2413
80,000–111,999	1.2441
112,000–149,999	1.1897
150,000–179,999	1.2132
≥ 180,000	1.2311

Source: Authors' compilation.

3.3.3 Disaggregation of harmonized variables

It was not necessary to disaggregate any of the variables.

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 3.7.

The data for the updating process consisted of the overall consumer price index (CPI) and components of CPI (food and non-food). Three uprating factors were created: overall CPI, CPI food, and CPI non-food. Values were inputted from 2009 to 2019. These were sourced directly from INE. The base period is December 2010. The average wage inflator was derived from data on minimum wage levels. Specific uprating factors were applied to expenditure data relating to alcohol, tobacco, and fuel.

3.5 Consumption levels

Consumption levels are based on the original reported consumption levels in the input data (xhh). These levels are 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.

The change in disposable income takes changes in market incomes (e.g. COVID-related decreases in earnings) as well as changes in benefits and contributions into account. 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).

[9] The same grossing factors were used as in the previous dataset as the tax bands used for that calculation were, in fact, for 2015 and so the grossing factors used are the same as before.

Table 3.7: Raw indices for deriving MOZMOD uprating factors

Index	Constant name	Values of the raw indices								Source	Income components uprated by the index
		2015	2016	2017	2018	2019	2020	2021	2022		
CPI overall (2016=100)	*$f_CPI_total*	81.26	97.28	114.89	119.94	122.70	126.00	132.96	147.33	National Statistics Authority (www.ine.gov.mz)	Y* (all except *yem* and *yse*)
CPI food index (2016=100)	*$f_CPI_food*	72.24	96.87	115.53	116.07	119.90	127.80	141.22	163.67	National Statistics Authority	X* (food)
CPI non-food index (2016=100)	*$f_CPI_non_food*	90.08	97.66	116.00	122.10	124.64	124.20	126.70	133.88	National Statistics Authority	X* (non-food, excluding alcohol, fuel, and tobacco)
Average wage inflator	*$f_general_wage_inflator*	2.14	2.33	2.69	2.99	3.21	3.21	3.38	3.77	Derived from Average Minimum Wage Inflation	*yem*, *yse*
Alcohol CPI (base December 2016=100)	*$f_CPI_Alcohol*	84.34	99.12	114.84	117.75	118.63	123.66	134.69	136.96	National Statistics Authority	X* (alcohol)
Tobacco CPI (base December 2016=100)	*$f_CPI_Tobacco*	84.34	99.12	114.84	117.75	118.63	123.66	134.69	136.96	National Statistics Authority	X* (tobacco)
Fuel CPI (base December 2016=100)	*$f_CPI_Fuel*	90.76	96.50	111.27	127.64	129.17	130.70	132.05	153.66	National Statistics Authority	X* (motor vehicle fuel—transport CPI used)

Note: CPI figures shown in this table are for June of each year.

Source: Authors' compilation.

4 Validation

4.1 Aggregate validation

MOZMOD results have been validated against external benchmarks where feasible. Detailed comparisons of the number of people receiving a given income component and total yearly amounts are shown in the Annex. The main discrepancies between MOZMOD results and external benchmarks are discussed in the following sub-sections. Factors that may explain the observed differences are also discussed.

The validation results shown below relate to the most recent five years (2018–22 inclusive), apart from the poverty and inequality results which relate to 2015–22. For validation results for 2015–17, see Castelo et al. (2022).

4.1.1 Validation of incomes inputted into the simulation

It was not possible to obtain external data on numbers of employed and unemployed people with which to compare the IOF (Table A1 in the Annex). It was also not possible to validate the number of recipients of various types of market income in the input dataset using external statistics (Table A2 in the Annex), nor the aggregate annual amounts of various types of market income (Table A3 in the Annex). In addition, it was not possible to assess the extent to which the non-simulated policies are adequately captured in the IOF as the IOF does not distinguish between receipt of different types of pensions (Tables A4 and A5 in the Annex).

4.1.2 Validation of outputted (simulated) incomes

Table A6 in the Annex compares the number of recipients of various types of simulated benefits/number of payers of simulated taxes or simulated social insurance contributions in MOZMOD with external statistics. Table A7 in the Annex compares the simulated and published aggregate yearly amounts for these simulated taxes and benefits.

Table A6 shows the published number of individuals paying personal income tax (employment and other) in 2018–22, and Table A7 shows the annual amounts. In combination, MOZMOD simulated 58 per cent of personal income tax (employment and other) in 2021.

For simplified tax, MOZMOD simulates a far larger number of taxpayers than is reported in the administrative data for 2020 (951 per cent). It is likely that this is because MOZMOD assumes full compliance; moreover, it is a choice of the taxpayer (up to the relevant threshold) to be enrolled in the simplified tax system rather than preparing and submitting their accounts, and in MOZMOD it is assumed that eligible taxpayers opt to pursue the simplified tax option. The simulated simplified tax for 2021 is 45 times larger than the actual revenue for 2021, whereas in the earlier years shown (2018–19), the simulated simplified tax is around seven times larger than the actual revenue. This stark change is due to the significant drop in actual revenue from this tax in 2020 and 2021, most likely due to the impact of the COVID-19 pandemic.

MOZMOD simulates more eligible people for DSSP than actually received support, so simulations of this policy were adjusted downwards to correspond to the level of expenditure. This may reflect a limited roll-out of the benefit in practice, and the policy is switched off in the model from 2019 onwards.

With respect to BSSP, MOZMOD simulates only about a quarter of the external validation figure for 2015–18. It is possible that this is due to a lack of precise disability-related variables in the IOF that correspond to the eligibility criteria for the BSSP. However, following the change to the policy that was introduced in the 2019 system, the simulated figures for BSSP exceeded the external validation data. BSSP receipt was therefore adjusted downwards in the 2019 and 2020 systems, so that the expenditure corresponded to the actual expenditure on BSSP in 2019 and 2020, respectively.

4.2 Income distribution

In Mozambique, a per-capita equivalence scale is used, whereby household consumption is divided by the number of household members to provide a per-capita consumption amount.

4.2.1 Income inequality

In Mozambique, inequality is measured with reference to consumption, not income. Table A8 in the Annex shows the published figure for 2015 (MEF 2016). The published consumption-based Gini coefficient based on IOF 2014–15 was 0.47, compared with 0.48 for the consumption-based Gini using MOZMOD for 2015, rising to 0.53 for 2018–22. The income-based Gini using MOZMOD is considerably higher at 0.82 for each year (2015–21), falling slightly to 0.81 in 2022.

4.2.2 Poverty rates

In Mozambique, there are 13 consumption-based poverty lines, which are separately calculated for 13 sub-areas of the country that have homogeneous characteristics (Table A9 in the Annex). The construction of a national poverty line is regarded as a forced attempt to produce an average poverty line that does not necessarily reflect what a national poverty line would actually be, but rather is only a statistical number, which is calculated from the average of the 13 poverty lines taking into account their weight.

Using IOF 2014–15, the national poverty line for 2015 was Mt 26.7 per person per day (MEF 2016: 74). For subsequent years this figure was uprated in the model using the CPI.

Table A10 in the Annex shows that the MOZMOD output data for 2015 yields a lower consumption-based poverty score than the published data (40.8 per cent rather than 46.1 per cent). The difference is likely to be due to the fact that MOZMOD's underpinning dataset uses two timepoints (T1 and T2) of the IOF 2014/15, rather than the three timepoints that were used for the construction of the published figure. Consumption-based poverty fluctuates slightly each year and, using MOZMOD, is estimated to be 47.6 per cent in 2022. The income-based poverty rate was estimated, using MOZMOD, to be 80.6 per cent in 2022.

4.3 Summary of 'health warnings'

As far as we have been able to ascertain, the income data in the IOF has not been used previously for research purposes. Although some data cleaning processes have been undertaken, there may be further steps that could be taken in this regard. The new IOF is being prepared for inclusion as an underpinning dataset for the model, and this new dataset will likely change the simulated results.

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Annex

Table A1: Employment and unemployment (validation data are not available)

Table A2: Number of recipients of various types of market income (validation data are not available)

Table A3: Aggregate annual amounts of market income (validation data are not available)

Table A4: Number of recipients of non-simulated pensions (not captured in IOF)

Table A5: Aggregate yearly amounts of various types of non-simulated pensions payable (not captured in IOF)

Table A6: Tax and benefit instruments simulated in MOZMOD: number of recipients (of the benefits) and payers (of the tax and social insurance contributions), 2018-2022

	2018	2019	2020	2021	2022
MOZMOD (A)					
Personal income tax: Employment	137,076	148,962	138,716	146,552	191,430
Personal income tax: Other	40,598	42,279	43,982	49,813	55,958
Simplified tax	2,304,731	2,303,962	2,274,353	2,266,624	2,286,304
Fuel tax	N/A	N/A	N/A	N/A	N/A
VAT	N/A	N/A	N/A	N/A	N/A
Excise duty	N/A	N/A	N/A	N/A	N/A
Social insurance: Private sector non-self-employed and self-employed contributors	833,638	833,638	806,280	805,951	837,988
Social insurance: Public sector contributors	339,041	339,041	314,482	310,981	339,041
DSSP[a] (*hh*)	19,281	N/A	N/A	N/A	N/A
BSSP[b] (*hh*)	93,396	333,911	336,647	335,269	357,294
External statistics (B)					
Personal income tax: Employment[c]	107,688	111,890	116,038	/	/
Personal income tax: Other	/	/	/	/	/
Simplified tax[c]	216,896	227,751	239,165	/	/
Fuel tax	N/A	N/A	N/A	N/A	N/A
VAT	N/A	N/A	N/A	N/A	N/A
Excise duty	N/A	N/A	N/A	N/A	N/A
Social insurance: Private sector non-self-employed and self-employed contributors	45,648[d]	/	/	/	/
Social insurance: Public sector contributors	/	/	/	/	/
DSSP[f] (*hh*)	16,628[e]	N/A	N/A	N/A	N/A
BSSP (*hh*)	404,806[e]	458,452[g]	445,085[h]	/	/
Per cent captured (A/B)					
Personal income tax: Employment	127.3	133.1	119.5	/	/
Personal income tax: Other	/	/	/	/	/
Simplified tax	1062.6	1011.6	951.0	/	/
Fuel tax	N/A	N/A	N/A	N/A	N/A
VAT	N/A	N/A	N/A	N/A	N/A
Excise duty	N/A	N/A	N/A	N/A	N/A
Social insurance: Private sector non-self-employed and self-employed contributors	1826.2	1824.5	/	/	/
Social insurance: Public sector contributors	/	/	/	/	/
DSSP (*hh*)	116.0	/	/	/	/
BSSP (*hh*)	23.1	72.8	75.6	/	/

Notes: VAT, value-added tax. N/A: Not applicable. '/': Not available. [a]The MOZMOD simulated figure for DSSP for 2018 was calculated using a downwards adjustment switch to constrain the total to that of the external validation data on expenditure for 2018. [b]The MOZMOD simulated figure for BSSP was randomly deflated using a downwards adjustment switch to constrain the total to that of the external validation data on expenditure for 2019 and 2020 for the 2019–20 systems, respectively. The downwards adjustment formula for BSSP in the 2021 and 2022 systems was held constant at the 2020 level in the absence of external validation data at the time of the model update. [c]GdM (2018, 2019, 2020, 2021). [d]NISS (2020a). [e]Ministry of Gender, Children and Social Action (2018). [f]This policy was switched off in 2019-2022 in the model. [g]INAS (2019). [h]INAS (2020).

Sources: Panel A: MOZMOD version 2.10. Panel B: see table notes.

Table A7: Tax and benefit instruments simulated in MOZMOD: annual amounts (million Mt)

	2018	2019	2020	2021	2022
MOZMOD (A)					
Personal income tax: Employment	11,871	13,358	12,575	13,650	17,396
Personal income tax: Other	8,558	9,148	9,127	9,901	11,868
Simplified tax	17,340	17,681	17,879	18,475	19,771
Fuel tax	2,001	2,001	2,001	2,001	1,060
VAT	36,545	37,315	37,723	39,210	42,060
Excise duty	3,963	3,993	4,162	4,533	4,610
Social insurance: Private sector non-self-employed and self-employed contributors	8,137	8,735	8,347	8,815	10,377
Social insurance: Public sector contributors	4,251	4,564	4,208	4,380	5,360
DSSP[k] (*hh*)	534	/	/	/	/
BSSP[l] (*hh*)	531	3,127	3,678	3,140	3,341
External statistics (B)					
Personal income tax: Employment	33,051.98[a]	37,320.5[b]	40,922.52[c]	40,476.97[i]	N/A
Personal income tax: Other	/	/	/	/	/
Simplified tax	241.98[a]	245.90[b]	40.64	40.63[i]	/
Fuel tax	6,492.33[a]	7,506.8[b]	6,518.65 [c]	6,569.5[i]	/
VAT	78,588.95[a]	75,687.8[b]	62,565.4 [c]	81,140.4 [i]	/
Excise duty[d]	8,211.73[a]	8,890.00[b]	9,603.29 [c]	10,224.1[l]	/
Social insurance: Private sector non-self-employed and self-employed contributors[e]	10,016.39	10,964.69	11,768.47	/	/
Social insurance: Public sector contributors	8,392.00[o]	/	/	/	/
DSSP (*hh*)	526.55[f]	554.58[g]	955.62[h]	2,156.31[m]	703.88[n]
BSSP (*hh*)	2,884.37[f]	3,121.69[g]	3,689.38[h]	5,327.90[m]	4,295.14[n]
Per cent captured (A/B)					
Personal income tax: Employment[j]	61.8	60.3	53.0	58.2	/
Personal income tax: Other	/	/	/	/	/
Simplified tax	7165.9	7190.3	43993.6	45471.3	/
Fuel tax	30.8	26.7	30.7	30.5	/
VAT	46.5	49.3	60.3	48.3	/
Excise duty	48.3	44.9	43.3	44.3	/
Social insurance: Private sector non-self-employed and self-employed contributors	81.2	79.7	70.9	/	/
Social insurance: Public sector contributors	50.7	/	/	/	/
DSSP (*hh*)	101.4	/	/	/	/
BSSP[j] (*hh*)	18.4	100.2	99.7	58.9	77.8

Notes: [a]GdM (2018). [b]GdM (2019). [c]GdM (2020). [d]The GdM figures are the sum of excise duty from national production and imported products. [e]NISS (2020b), NISS (2022). [f]Ministry of Gender, Children and Social Action (2018). [g]INAS (2019). [h]INAS (2020). [i] GdM (2021). [j]The sum of simulated figures for personal income tax (employment and other) divided by external figure. [k]The MOZMOD simulated figure for DSSP for 2018 was calculated using a downwards adjustment switch to constrain the total to that of the external validation data on expenditure for 2018. This policy was switched off in 2019–22 in the model. [l]The MOZMOD simulated figure for BSSP was randomly deflated using a downwards adjustment switch to constrain the total to that of the external validation data on expenditure for 2019 and 2020 for the 2019–20 systems, respectively. The downwards adjustment formula for BSSP in the 2021 and 2022 systems was held constant at the 2020 level in the absence of external validation data at the time of the model update. [m]Ministry of Gender, Children and Social Action (2021). The DSSP figure for this year also includes the cost of the DSSP emergency payments in response to the COVID-19 pandemic. [n]Ministry of Gender, Children and Social Action (2022). [o]Ministry of Labour, Employment and Social Security (2022).

Sources: Panel A: MOZMOD version 2.10. Panel B: see table notes.

Table A8: Income inequality, 2015–22

Gini coefficient	2015	2016	2017	2018	2019	2020	2021	2022
MOZMOD (A)								
Income-based	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.81
Consumption-based	0.48	0.48	0.49	0.53	0.53	0.53	0.53	0.53
External statistics (B)								
Income-based	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Consumption-based	0.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Per cent captured (A/B)								
Income-based	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Consumption-based	102.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: The MOZMOD figures assume full take-up of simulated benefits with the exception of DSSP for which receipt was randomly deflated to match reported expenditure for 2016 for the 2015–17 systems and reported expenditure for 2018 for the 2018 system; and BSSP was randomly deflated to match reported expenditure for 2019 and 2020 for the 2019–20 systems, respectively. The downwards adjustment formula for BSSP in the 2021 and 2022 systems was held constant at the 2020 level in the absence of external validation data.

Source: Panel A: Simulated output from MOZMOD V 2.10. Panel B: MEF (2016: 27).

Table A9: Consumption-based poverty lines in Mozambique by area, for 2015

Spatial domains	Poverty lines in 2015 (using IOF 2014–15) (Mt per person per day)
Niassa & Cabo Delgado—rural	29.6
Niassa & Cabo Delgado—urban	33.6
Nampula—rural	19.7
Nampula—urban	26.7
Sofala & Zambézia—rural	19.6
Sofala & Zambézia—urban	26.9
Manica & Tete—rural	24.5
Manica & Tete—urban	34.0
Gaza & Inhambane—rural	28.2
Gaza & Inhambane—urban	32.7
Maputo Província—rural	37.6
Maputo Província—urban	41.7
Maputo City	40.2

Source: MEF (2016: 74).

Table A10: Poverty rates, 2015–22

Poverty head-count	2015	2016	2017	2018	2019	2020	2021	2022
MOZMOD (A)								
Income-based	80.5	81.6	81.8	81.1	80.5	81.4	81.5	80.6
Consumption-based	40.8	43.7	45.0	48.3	47.3	48.1	48.3	47.6
External statistics (B)								
Consumption-based	46.1[a]	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Per cent captured (A/B)								
Consumption-based	88.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: External figures and MOZMOD figures use per-capita equivalization. The MOZMOD figures are calculated using consumption-based poverty lines of Mt 26.7 per person per day for 2015, uprated by the CPI for subsequent years. The MOZMOD figures assume full take-up of simulated benefits with the exception of DSSP for which receipt was randomly deflated to match reported expenditure for 2016 for the 2015–17 systems and reported expenditure for 2018 for the 2018 system; and BSSP was randomly deflated to match reported expenditure for 2019 and 2020 for the 2019–20 systems, respectively. The downwards adjustment formula for BSSP in the 2021 and 2022 systems was held constant at the 2020 level in the absence of external validation data. [a]This was calculated using a consumption-based poverty line used for 2015 of Mt 26.7 per person per day.

Source: Panel A: Simulated output from MOZMOD v2.10. Panel B: MEF (2016: 12).