SOUTHMOD

Country report

# Zambia

MicroZAMOD v2.12
2010, 2015–20

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May 2022

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# Acknowledgements

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# About the project

SOUTHMOD – simulating tax and benefit policies for development

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

SOUTHMOD models are currently available for Ecuador (ECUAMOD), Ethiopia (ETMOD), Ghana (GHAMOD), Mozambique (MOZMOD), Namibia (NAMOD), Viet Nam (VNMOD), South Africa (SAMOD), Tanzania (TAZMOD), Uganda (UGAMOD), and Zambia (MicroZAMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents MicroZAMOD, the SOUTHMOD model developed for Zambia. This work was carried out by Zambia Institute for Policy Analysis & Research (ZIPAR) in collaboration with the project partners.

The results presented in this report are derived using MicroZAMOD version 2.12 running on EUROMOD software 3.1.8. 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 MicroZAMOD results against external data sources. For further information on access to MicroZAMOD and other SOUTHMOD models, see the SOUTHMOD page.

The MicroZAMOD model and its documentation in this country report has been prepared within the UNU-WIDER project on 'SOUTHMOD—simulating tax and benefit policies for development'. For more information, see the SOUTHMOD project page.

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The Institute is funded through income from an endowment fund with additional contributions to its work programme from Denmark, Finland, Sweden, and the United Kingdom.

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# Contents

## Tables

## Acronyms

| | |
|---|---|
| C-ECT | COVID-19 Emergency Cash Transfer |
| CPI | Consumer price index |
| CSO | Zambian Central Statistical Office |
| CST | Community Skills Development and Training programme |
| FISP | Farmer Input Support Programme |
| FSP | Food Security Pack |
| eFISP | Electronic-Voucher Farmer Input Support Programme |
| HGSM | Home-Grown School Meals |
| KGS | Keeping Girls in School |
| LASF | Local Authority Superannuation Fund |
| LCMS | Living Conditions Monitoring Survey |
| LFS | Labour Force Survey |
| NAPSA | National Pension Scheme Authority |
| NHIS | National Health Insurance Scheme |
| PAYE | Pay as you earn |
| PSPF | Public Service Pension Fund |
| PWAS | Public Welfare Assistance Scheme |
| OVCB | Orphans and Vulnerable Children Bursary |
| SCT | Social cash transfer |
| SP | Social Pension Contributions |
| SWL | Supporting Women's Livelihood Programme |
| VAT | Value-added tax |
| ZAPD | Zambia Agency for Persons with Disabilities |
| ZMW | Zambian Kwacha |

# 1 Basic information

This report documents the development of a tax–benefit microsimulation model for Zambia, MicroZAMOD. The report provides a brief description of the tax–benefit system in Zambia in Section 1. The selected taxes and benefits that are simulated in MicroZAMOD are described in detail in Section 2. The report also describes the data that underpin the model, including any adjustments, imputations, and assumptions made (Section 3). Section 4 concludes the report by providing a validation of the model findings based on external information.

## 1.1 Basic information about the tax–benefit system

Although Zambia's tax system is reasonably well developed and comparable with those found in most developing countries, the range of social benefits remains narrow and is in the process of development. As noted by the World Bank (2013), the social benefit programmes are too fragmented, incoherent, and transitory to provide a solid enough safety net. This has also been widely acknowledged by the Government of Zambia (MCDMCH 2014). Thus, Zambia is in the process of expanding its social protection programmes, such as the social cash transfer (SCT) scheme and streamlining its other social protection policies.

The benefit system is largely contributory and consists of pension schemes governed by various laws.[1] The state pension age used to be 55 years. In November 2014, under the Public Service (Retirement Age) Regulations *2014* (*Statutory Instrument* No. *63 of 2014*), this was raised to 65 years, but in May 2015 this was lowered to 60 years with options of 55 years and 65 years for early retirement and late retirement, respectively, under the Public Service (Retirement Age) (Amendment) Regulations 2015 (Statutory Instrument No. 24 of 2015).

The tax system consists of direct and indirect taxes. The most important source of revenue is income tax, followed by value-added tax (VAT) (IMF 2015; ZRA 2015a). Direct taxes are generally individual-based whereas some social protection programmes also have household-specific eligibility conditions.

The fiscal year in Zambia follows the calendar year and tax changes outlined in government budgets in the fourth quarter of the previous year usually take place at the beginning of the calendar year.

Primary school in Zambia starts at the age of 7 years, and free basic education includes seven grades of primary school followed by 5 years of secondary school. Dropout rates, however, are non-negligible at each grade throughout primary school (MESVTEE 2014).

There is no uniform definition of working age. Prior to 2017, the SCT had a demographic test that consisted of an economic 'fit-for-work' criterion. For the purposes of the SCT scheme, working age or fit-for-work individuals were defined as being 19–64 years of age. In the Living Conditions Monitoring Survey (LCMS), socio-economic status is assigned to everyone 12 years of age or over. In the estimates derived from the Labour Force Survey (LFS), employment status

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[1] **National Pension Scheme Authority Act, Public Services Pension Fund Act, Local Authorities Superannuation Fund Act, and Pension Scheme Regulation Act.**

is defined for individuals 15 years of age and above. The statutory minimum age for light work defined in the Employment of Young Persons and Children Act is 13 years, and the minimum contractual age is 16 years.

## 1.2 Social benefits

**Benefit 1** (*Social Cash Transfer, SCT*): The SCT programme was initiated as a pilot scheme by Zambia's Ministry of Community Development and Social Services (2017) as an intervention to reduce extreme poverty and intergenerational transfer of poverty among beneficiary households and the community. The SCT pilots were designed to protect and promote the livelihoods and welfare of households suffering from critical levels of poverty and deprivation. At the end of 2015, the SCT was being implemented in 50 districts. In 2016, the programme was rolled out to an additional 28 districts using the harmonized inclusive model (MCDSS 2015). In 2021, beneficiary households are entitled to Zambian Kwacha (ZMW) 150 per month, which they receive on a bi-monthly basis as a sum of ZMW 300 every 2 months. Different eligibility criteria exist for urban and rural areas. Beneficiary households containing one or more disabled members are eligible for double the standard amount.

**Benefit 2** (*Home-Grown School Meal Programme, HGSM*): This is a district-based programme administered by Zambia's Ministry of General Education. The programme initially covered 22 districts selected on the basis of a food security measure and education test scores of a particular district. The coverage has now increased to 38 districts. All public schools in the eligible district provide free school meals daily to learners, prepared from maize meal, pulses, and oil. The HGSM came into being in 2013 after the signing of a memorandum of understanding between the Ministry of Education and Early Education in Zambia and the United Nations World Food Programme. The main objective of this programme is to improve attendance and consequently the quality of education in schools, especially for learners from vulnerable and food insecure households (GRZ 2013). The HGSM took over from an earlier supported feeding programme in which food commodities for the school feeding were procured from outside the country. The HGSM is required to use only locally produced food; hence, the name of the programme. This programme is a school-based programme and cannot be provided if children are not in school as was the case during 2020 and 2021 due to COVID-19. In response to COVID-19, the government announced the closure of all schools on 17th March 2020. It was later announced that only the examination classes would resume on 1st June 2020. The closure of schools also led in the stoppage of the HGSM until all schools were reopened on 21st September 2020. Schools closed again on 17 June 2021 and only reopened on 23 August. Examination classes grade 9 and 12 reopened on 9 August.

**Benefit 3** (*Farmer Input Support Programme, FISP; Electronic-Voucher Famer Input Support Programme, eFISP*): This programme is administered by the Ministry of Agriculture (MoA 2017) and is intended to benefit smallholder farmers to promote household and national food security by providing access to agricultural inputs. The original FISP package consisted of two 50-kg bags of basal-dressing fertilizer, two 50-kg bags of top-dressing fertilizer, and one 10-kg bag of maize seed. To benefit from this pack, farmers needed to be actively engaged in farming and have the capacity to cultivate between 0.5 and 5 ha. Eligible farmers also had to belong to a farmers' cooperative and be able to pay a 50 per cent share of the fertilizer price and a 40 per cent share of the seed price. During the 2015–16 farming season, the Ministry of Agriculture implemented the eFISP scheme. A total of 241,000 farmers across the 13 pilot districts in Southern, Lusaka, Central, and Copperbelt Provinces received the eFISP subsidy through pre-paid VISA bank cards rather than receiving physical inputs centrally procured by the

government. During the 2016–17 farming season, the government extended the programme to 39 additional districts and rolled it out nationwide in 2017–18. The introduction of the E-voucher system was intended to improve beneficiary targeting, promote agricultural diversification, and ensure timely access to inputs by smallholder farmers.

**Benefit 4** (*Food Security Pack, FSP*): This programme targets vulnerable and viable small-scale farming households and consists of a package of inputs sufficient to cultivate 0.5 ha of maize, 0.25 ha of legumes, and in some cases chicken and goats. Eligibility of beneficiaries is based on having access to less than 2 ha of land and having the ability to work but having no gainful employment. Furthermore, eligible households must either be headed by a female or have orphans or children, or a child- or disabled-head of the family. There is an obligation to make a partial repayment of the benefit in terms of the share of the yield from the pack.

**Benefit 5** *(Supporting Women's Livelihoods, SWL)*: SWL is a programme under the Girls Education and Women Empowerment and Livelihoods (GEWEL) Project that builds on existing government structures to support women's livelihood productivity and economic empowerment. Under this project, the government provides support in form of a comprehensive package of activities for beneficiaries, including context-specific training in business and life skills, productivity grants, mentoring and peer support, and facilitation of saving groups. All beneficiaries under the SWL are drawn from SCT households.

**Benefit 6** *(Keeping Girls in School, KGS)*: KGS is a component under the GEWEL project which is aimed to increase access to secondary education for disadvantaged adolescent girls between the ages of 14 and 21 in extremely poor households in 27 selected districts. All beneficiaries under the KGS are drawn from SCT households.

**Benefit 7** *(Community Skills Development and Training)*: This programme provides an opportunity for beneficiaries to acquire the certified trade test level 3. This enables them to acquire trade-tested skills for them to be engaged in an income-generating activity such as bricklaying, tailoring, and others. The programme is administered by the Ministry of Community Development and Social Services (MCDSS), and the training provided by the 11 skills training centres of the ministry (provincial centres). It is a six-month programme that is currently implemented in Mansa, Mungwi, Kabwe, Masaiti, Mongu (Namushekende), Lundazi, Katete, Solwezi, Monze, Gwembe, and Livingstone districts. The programme has benefitted over 900 beneficiaries in 2020. The overall target is 1,000 beneficiaries per year (GRZ 2019).

**Benefit 8** (*Orphans and Vulnerable Children Bursary, OVCB*): The bursary (OVCB) is administered by Zambia's Ministry of General Education and is targeted at orphans and vulnerable children by providing them with secondary school fees and boarding fees.

**Benefit 9** (*COVID-19 Emergency Cash Transfer, C-ECT*): In response to the COVID-19 Pandemic, the UN agencies in Zambia set up a COVID-19 Emergency Cash Transfer Response (C-ECT). The initiative was set up jointly with the Zambian government through the Ministry of Community Development and Social Services (MCDSS). The C-ECT was launched in July 2020 and provided transfers to households for a period of 6 months. A total of 22 districts was targeted, and beneficiaries within those districts received ZMW 400 per month for 6 months. Beneficiaries already on the traditional Social Cash Transfer (SCT) programmes received the ZMW 90 in addition to the ZMW 400 from the C-ECT. The C-ECT was supported by UNICEF, the International Labour Organization (ILO), the World Food Programme and the United Nations Development Programme (UNDP) and other cooperating partners such as Plan International, Child Fund and Zambia Red Cross Society.

## 1.3    Not strictly benefits (not included in the model)

**Not strictly benefit 1** (*Public Welfare Assistance Scheme, PWAS*): This is the Government of Zambia's social assistance programme aimed at mitigating social economic shocks and other negative effects such as poverty and the HIV/AIDS pandemic. Specifically, PWAS is aimed at assisting the most vulnerable in the society to fulfil their basic needs—particularly health, education, food, and shelter—to overcome problems of extreme poverty and vulnerability. Social support rendered under this scheme includes supply of food, shelter, clothing, and repatriation to stranded persons. There is also education support in that children from households registered under PWAS are provided with necessary school requirements for primary and secondary school. In addition, health care support assists in identifying destitute persons with orthopaedic medicines and appliances such as artificial limbs, shoes, crutches, and spectacles. PWAS targets extremely poor older persons, orphans or neglected children, chronically ill or disabled persons, and households headed by a single female.

## 1.4    Social contributions

The pension industry in Zambia is based on a compulsory and a voluntary system. Employees in the formal sector are required to contribute to one of the following three public schemes: the Public Service Pension Fund (PSPF), the National Pension Scheme managed by the National Pension Scheme Authority (NAPSA), and the Local Authority Superannuation Fund (LASF). The LASF and PSPF are gradually being phased out with no new members. Therefore, these are not included in the description below.[2]

**Social contribution 1** (*National Pension Scheme*): All new private and public formal sector employees are required to register with a pension scheme administered by NAPSA. Presently, the monthly contribution rate is pegged at 10 per cent of a worker's gross monthly earnings (5 per cent is paid by the employee and 5 per cent by the employer). The contributions are subject to a ceiling. The contribution ceiling is revised annually, and the revision takes effect from January of each year. The following constitute gross earnings for NAPSA purposes: basic salary plus leave pay, commuted days, overtime, bonus, and all allowances such as housing and transport.

**Social contribution 2** (*Workers' Compensation Fund*): In addition to the pension schemes, employers must register and pay contributions to the Workers' Compensation Fund Control Board (WCF). The contribution rates vary by economic activities and their associated risks. The Workers' Compensation Fund Control Board provides pensions to people who have been disabled or killed by a work-related accident or because of a work-related disease. Compensation is payable for temporary or permanent disablement and depends on the degree thereof. Temporary disablement is defined as not exceeding 18 months. When a worker's injuries are static, the degree of permanent disability will be determined. If the worker has suffered permanent disablement of 10 per cent, they will be eligible for a lump sum compensation. If the degree of disablement is 11 per cent and above, the worker is entitled to a pension for life.

**Social contribution 3** (*National Health Insurance Scheme*): The National Health Insurance Act No. 2 of 2018 was enacted by the government in a bid to achieve universal health coverage.

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[2] **Sources in this section include NAPSA (n.d).**

The Act led to the establishment of the compulsory National Health Insurance Scheme (NHIS) managed by the National Health Insurance Management Authority (NHIMA). In September 2019, the government issued Statutory Instrument No. 63 Of 2019 which among other things provided guidance on the contributions to the scheme. According to the Statutory Instrument, employed persons are mandated to contribute 1% of their gross monthly earnings while their employer is also expected to match the 1% of gross monthly earnings. Self-employed persons are also mandated to contribute 1% of their gross monthly earnings. The deadline for payment of the contributions was set at the 10th of the following month. The National Health Insurance Scheme was operationalised in October 2019 and by September 2020 540,000 beneficiaries had been registered. A total of 126 health facilities nationwide had also been accredited during the same period.

## 1.5 Taxes

This section describes direct and indirect taxes. However, taxes that are not amenable to microsimulation, such as company income tax and property transfer tax, are not discussed.

**Tax 1** (*Income tax*): This is a tax on profits earned by companies and emoluments earned by employees. Self-employed individuals are also liable to pay income tax. Thus, income tax consists of company income tax[3] and personal income tax. Personal income tax is levied on all income with a few exceptions, such as Labour Day awards, ex-gratia payments, medical expenses, funeral expenses, and sitting allowances for councillors. Personal income tax in Zambia is largely collected via the 'pay as you earn' (PAYE) scheme.[4] It has four income bands that are adjusted on an ad hoc basis during national budgets to provide relief in times of high inflation.

**Tax 2** (*Turnover tax*): This is a tax on gross sales/turnover, such as income, earnings, revenue, yield, and proceeds of small individual traders or companies with an annual turnover of ZMW 800,000 or less unless they are voluntarily registered to pay VAT. This tax regime includes informal workers such as street traders. Prior to 2017, turnover tax was calculated at 3 per cent of turnover for individuals with turnover of less than ZMW 800,000. In 2017, the rules changed to consist of six turnover bands (with associated turnover tax liabilities). However, in 2019, the turnover tax schedule returned to a flat rate, this time calculated at 4 per cent of turnover, applied to all turnover of less than ZMW 800,000.

**Tax 3** (*VAT*): VAT on goods and services is levied at the standard rate of 16 per cent, and a 0 per cent rate for exports and selected non-export goods. There are also several VAT-exempted items/services.

**Tax 4** (*Excise taxes*): Excise taxes are levied on selected commodities that include tobacco products, alcoholic beverages, petroleum products, motor vehicles, pollutants, cosmetics, and mobile telecommunication airtime. The taxes are levied at different rates and are either ad valorem or specific rates.

**Tax 5** (*Medical levy*): This levy existed prior to 2013. It was charged at the rate of 1 per cent on gross interest earned on savings with banks and other financial institutions. In 2013, the medical

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[3] See ZRA (2017a) for a description of company income tax rates.

[4] See ZRA (2016) for a description of PAYE.

levy was abolished together with all taxes on interest earned on savings in order to promote a culture of savings and investment.

# 2 Simulation of taxes and benefits in MicroZAMOD

## 2.1 Scope of simulation

The policy systems provided in MicroZAMOD v2.12 capture policies as they were in place as of 1st July of that specific year. Each system thus provides a "snapshot" of the situation of the tax-benefit system at the cut-off date. Usually, tax and benefit policies are not changed on a monthly basis. Often changes happen on a yearly as amendments of existing policies if at all. The standard "snapshot" policy systems modelled for the years 2010 and 2015 through 2021 should therefore nevertheless provide a quite comprehensive picture of the main features of the tax-benefit system despite this "point-in-time" perspective.

Tables 2.1 and 2.2 provide an overview of benefit and tax elements in Zambia and how they are treated in MicroZAMOD. Only cash and quasi-cash transfers are included in the simulation. The simulations focus on the cash or quasi-cash component of the programmes and do not take other elements such as training into account. Indirect subsidies are not considered in the model. Complete simulation for personal income tax, turnover tax, and VAT is possible. Selected excise duties with a significant impact on individuals are also simulated. Employee contributions to a pension scheme and the National Health Insurance Scheme are also possible. Simulation of medical levy is only possible in the year 2010 because it was abolished in 2013.

## Table 2.1: Simulation of benefits in MicroZAMOD, 2010–20

| Name | Variable | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Why not fully simulated? |
|------|----------|------|------|------|------|------|------|------|--------------------------|
| **Social assistance** | | | | | | | | | |
| SCT | *bsa_s* | - | S | S | S | S | S | S | 2010 is not simulated because SCT was still not widely scaled up. It is not possible to simulate the community verification process of eligible households. |
| C-ECT | *bsacv01_s* | - | - | - | - | - | - | PS | COVID emergency benefit only available for 6 months in 2020. Only the 'vertical expansion' element is modelled due to lack of information. |
| SWL | *bsawo_s* | - | - | - | S | S | S | S | It is not possible to simulate the community verification process of eligible households. |
| **Agriculture benefits** | | | | | | | | | |
| eFISP[1] | *bag_s* | - | PS | PS | PS | PS | PS | PS | eFISP introduced in 2015/16. The eligibility criteria related to ownership of livestock could not be modelled due to lack of data. |
| FSP | *bag01_s* | - | PS | PS | PS | PS | PS | PS | Only four components that are available across the years are simulated due to lack of information on policy rules and ownership of livestock in the data. |
| **Education benefits** | | | | | | | | | |
| KGS | *bed01_s* | - | - | - | PS | PS | PS | PS | Only fees of day schools are considered in the simulation. |
| CST | *bed02_s* | - | - | - | - | - | - | S | Information only available for 2020. |
| HGSM | *bedot_s* | I | S | S | S | S | S | S | The correct monetary amounts for the value of the school meals in 2015–2016, 2018, and 2019 were unknown; so, they were estimated by adjusting the 2017 value by the food component of the CPI. |
| OVCP | - | E | E | E | E | E | E | E | Not possible to identify recipients. |

Notes: "-": policy did not exist in that year; "E": excluded from the model as it is neither included in the micro-data nor simulated; "I": included in the micro-data but not simulated; "PS" partially simulated as some of its relevant rules are not simulated; "S" simulated although some minor or very specific rules may not be simulated. [1]The original FISP is not simulated as it was replaced by the eFISP in the 2015–16 farming season.

Source: Authors' compilation.

## Table 2.2: Simulation of taxes and social contributions in MicroZAMOD, 2010–20

| | Variable | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Why not fully simulated? |
|---|---|---|---|---|---|---|---|---|---|
| **Taxes** | | | | | | | | | |
| Personal income tax | tin_s | S | S | S | S | S | S | S | |
| Presumptive turnover tax | ttn_s | S | S | S | S | S | S | S | |
| Medical levy | thl_s | S | - | - | - | - | - | - | Abolished in 2013. |
| VAT | tva_s | S | S | S | S | S | S | S | |
| Excise duty | tex_s | PS | PS | PS | PS | PS | PS | PS | Simulated for main excise duties only. |
| **Social insurance contributions** | | | | | | | | | |
| Employee pension contribution | tsceepi_s | S | S | S | S | S | S | S | |
| Employer pension contribution | tscerpi_s | S | S | S | S | S | S | S | |
| Employee health insurance contribution | tsceehl_s | - | - | - | - | - | - | S | |
| Employer health insurance contribution | tscerhl_s | - | - | - | - | - | - | S | |
| Self-employed health insurance | tscsehl_s | - | - | - | - | - | - | S | |
| Worker compensation fund | | E | E | E | E | E | E | E | No information available. |

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

Source: Authors' compilation.

## 2.2    Order of simulation and interdependencies

Table 2.3 shows the order in which the main elements of MicroZAMOD are simulated, for time points 2010 and 2015–21. There were no changes in the order of simulation between the seven periods.

Medical levy is only simulated in 2010 because it was abolished in 2013. The National Health Insurance Scheme was only introduced in 2020 so is only simulated from 2020 onwards. Employee and employer social contributions are simulated first. Next, turnover tax is simulated. Personal income tax is then simulated for those individuals with turnover above the turnover tax threshold and all those liable to pay personal income tax. The SCT policy is simulated next, taking into account differences in rural/urban eligibility conditions. This is followed by the temporary C-ECT benefit. Five further benefit policies are then simulated: SWL, KGS, CST, HGSM, FSP, and eFISP. Finally, simulations are undertaken for VAT and excise duties.

## Table 2.3: MicroZAMOD spine: Order of simulation

| Policy | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Description |
|---|---|---|---|---|---|---|---|---|
| setDefault_zm | On | n/a | n/a | n/a | n/a | n/a | On | DEF: Set default |
| uprate_zm | On | On | On | On | On | On | On | DEF: Uprating factors |
| lma_zm | Off | Off | Off | Off | Off | Off | On | DEF: Labour market adjustment |
| neg_zm | On | On | On | On | On | On | On | DEF: Recode negative income |
| ildef_std_zm | On | On | On | On | On | On | On | DEF: Standard income list |
| ildef_non_std_zm | On | On | On | On | On | On | On | DEF: Model specific income list |
| ildef_stats_zm | On | On | On | On | On | On | On | DEF: Stats presenter income list |
| ildef_exp_zm | On | On | On | On | On | On | On | DEF: Expenditure income list |
| tudef_zm | On | On | On | On | On | On | On | DEF: Assessment units |
| hh_types_zm | On | On | On | On | On | On | On | DEF: Household types |
| constdef_zm | On | On | On | On | On | On | On | DEF: Constants |
| spl_zm | On | On | On | On | On | On | On | INC: Poverty lines |
| ses_zm | On | On | On | On | On | On | On | INC: Equivalence scales |
| tsceepi_zm | On | On | On | On | On | On | On | SIC: Employee pension contributions |
| tscerpi_zm | On | On | On | On | On | On | On | SIC: Employer pension contributions |
| tsceehl_zm | n/a | n/a | n/a | n/a | n/a | n/a | On | SIC: Employee HNIS contributions |
| tscerhl_zm | n/a | n/a | n/a | n/a | n/a | n/a | On | SIC: Employer HNIS contributions |
| tscsehl_zm | n/a | n/a | n/a | n/a | n/a | n/a | On | SIC: Self-employed HNIS contributions |
| ttn_zm | On | On | On | On | On | On | On | TAX: Turnover tax |
| tin_zm | On | On | On | On | On | On | On | TAX: Personal income tax |
| thl_zm | On | n/a | n/a | n/a | n/a | n/a | n/a | SIC: Medical levy |
| bsa_zm | n/a | On | On | On | On | On | On | BEN: SCT |
| bsacv01_zm | n/a | n/a | n/a | n/a | n/a | n/a | Off | BEN: C-ECT |
| bsawo_zm | n/a | n/a | n/a | On | On | On | On | BEN: SWL |
| bed01_zm | n/a | n/a | n/a | n/a | n/a | n/a | On | BEN: KGS |
| bed02_zm | n/a | n/a | n/a | n/a | n/a | n/a | Off | BEN: CST |
| bedot_zm | n/a | On | On | On | On | On | On | BEN: HGSM |
| bag_zm | n/a | n/a | On | On | On | On | On | BEN: eFISP |
| bag01_zm | n/a | n/a | n/a | n/a | n/a | n/a | On | BEN: FSP |
| tva_zm | On | On | On | On | On | On | On | TAX: VAT |
| tex_zm | On | On | On | On | On | On | On | TAX: Excise duty |
| xhhadj_zm | On | On | On | On | On | On | On | INC: Adjust consumption to new disposable income |
| output_std_zm | On | On | On | On | On | On | On | DEF: Output individual level |
| output_std_hh_zm | Off | Off | Off | Off | Off | Off | Off | DEF: Output household level |

Source: Authors' compilation.

## 2.3    Policy switches

There are several so-called policy extensions in MicroZAMOD. Extensions offer various additions to the baseline (the standard MicroZAMOD model) that users can select. More than one policy as well as functions from different policies can belong to a single extension. Furthermore, the same policy or function can belong to more than one extension. Extensions can be by default 'switched on', i.e. calculations are carried out, or 'off'. The default is defined in the 'Set Switches' menu. Noteworthy, users can select whether to run the tax-benefit simulations with the extension being 'on' or 'off' in the run dialogue.

**Pov_moderate extension**: This extension allows users to change from an extreme/severe poverty definition to the moderate poverty line. While the extreme/severe poverty line is used as a default, users can switch the extension on to use the moderate poverty line. The selected poverty definition is also picked up in the Statistics Presenter tool.

**Full-year adjustment of COVID-related policies**: Separate full-year adjustment (FYA) policy switches are applied to two COVID-related policies in 2020, namely the Emergency Cash Transfer and the suspension of the Home Grown School Meal Programme due to closing of schools.

Both of these policies modelled in the 2020 policy system were in place only for the duration of six months during the 2020 calendar year. MicroZAMOD 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 emergency cash transfer (available from July onwards) would be assumed effective throughout the whole calendar year, while school meals (not available between March and September) would not be modelled as they were not available during the cut-off date of 1 July.

In MicroZAMOD v2.12, this is accounted for by applying 'full-year adjustment' to these policies. This ensures that average benefit amounts are adjusted to reflect the number of months the programmes were available during the 2020 calendar year. The adjustment is applied by incorporating an extension switch called 'Full Year Adjustment' (FYA) to the policies (see Gasior et al. 2021 for details). When the switch is set 'on' (the default setting in the 2020 policy system), benefit amounts in the two policies are automatically adjusted downwards, i.e. multiplied by 6/12.

Note that income shocks from COVID-19 in 2020 ('lma_zm' 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 impact of COVID-related policies, covering the entire calendar year of 2020. The user is free to use alternative modelling assumptions.

More details on the modelling of the Emergency Cash Transfer and Home Grown School Meal Programme are available in the dedicated sub-sections (1.2, 2.4.2, and 2.4.6). Section 3.2 describes the 'on-model' adjustment of incomes during the pandemic.

## 2.4   Social benefits

This section describes the policy rules of simulated benefits in more details. Furthermore, it includes information on assumptions used in the MicroZAMOD.

### 2.4.1   Social Cash Transfer (SCT) (bsa_s)

The SCT is a cash benefit provided to vulnerable households in rural and urban areas of Zambia. The programme was piloted in the district of Kalomo in 2003, expanded in the following years (50 districts in 2015 and 78 districts in 2016), and rolled-out to all districts in 2017.

In 2017, the eligibility criteria for the SCT were amended by the removal of one category of eligibility (the fit-to-work criteria) and the simultaneous introduction of several new categories of eligibility (household composition criteria).

**Definitions**

- Child-headed household: the head of the household is 18 years or younger and is not married, and the household is verified by members of the community to be a child-headed household.
- Elderly person: persons aged 65 years and above.
- Household with members with severe disability: for this programme, severe disability is assessed by medical professionals and reflected in a Disability Medical Assessment Slip or a ZAPID that indicates the level of disability.
- Households with members who are chronically ill and on palliative care: a household member is regarded as chronically ill and on palliative care if their Medical Assessment Slip states this.
- Female-headed household: the head of the household is a female who is between the ages of 19 and 64 years, has at least three children under the age of 19 years, is not married, and who is verified by members of the community to be the head of the household.

**Eligibility conditions**

In order to be eligible for SCT in rural areas from 2017 onwards, the household should satisfy the following conditions (GRZ 2015):

1. Household composition criteria:
   a. Household contains an elderly person aged 65 years or above, or
   b. Household contains one or more members with severe disability, or
   c. Household contains one or more members who are chronically ill and on palliative care, or
   d. Female-headed household, or
   e. Child-headed household, and
2. Living conditions test: households must have a 'living conditions index' score (see below) below the specified threshold to indicate they are poor.

Prior to 2017, the SCT contained the residency and the living conditions test plus a demographic fit-for-work test: to be eligible under this category, households needed to have a ratio of unfit to fit members of three or more. The definition of fit-for-work included all those household members capable of working, who are not chronically ill or disabled, aged between 19 and 64 years, and not attending school. Anyone not meeting these fit-for-work criteria were classed as 'unfit for work'. In addition, eligible urban households had to contain at least one disabled member of any age.

Across years, the living conditions test, consisting of the living conditions index, was designed using different characteristics or variables for urban and rural areas. Each of these characteristics is associated with a specific contribution score that is summed up to give a total household score. The living conditions test is, in effect, a 'proxy means test': the higher the total score the greater the chances that the household is relatively well off; the lower the total score the greater the chances that the household is relatively poor.

The variables used in the living conditions index are listed in Table 2.4 below.

**Table 2.4: Variables used in the living conditions index**

|  | Rural | Urban |
|---|---|---|
| Highest education level achieved by household members 15 years and above | X | X |
| Ownership of electric iron | X | X |
| Ownership of sofa | X | X |
| Source of lighting | X | X |
| Type of toilet used | X | X |
| Most used cooking fuel | X |  |
| Ownership of clock | X |  |
| Ownership of mattress | X |  |
| Ownership of television | X |  |
| Type of roof in the house | X |  |
| Ownership of bed |  | X |
| Ownership of computer |  | X |
| Ownership of dining table |  | X |
| Type of dwelling |  | X |
| Type of floor |  | X |

Source: Authors' elaboration based on GRZ (2015).

**Income test**

There is no income test for this benefit (although the living conditions index is, in effect, a proxy means test).

**Benefit amount**

In 2015, the benefit amount was ZMW 70 per month and ZMW 140 for households with one or more disabled persons.

From 2016 to 2020, the benefit amount was ZMW 90 per month, and households containing one or more disabled persons received double the amount (i.e. ZMW 180).

In 2021, the benefit amount is increased to ZMW 150 and ZMW 300 for disabled persons.

The benefit is paid bi-monthly, meaning that beneficiaries receive double the monthly amount every second month.

**MicroZAMOD notes**

The programme was still only a pilot in a limited number of districts and is thus not modelled in the 2010 policy system.

The residency test requires that households should have resided in the same catchment area for at least 6 months to be eligible for the cash transfer. However, the LCMS dataset only contains a question about where the person resided 12 months previously and so this criterion was applied instead.

The model uses the education level of the household head to calculate the education score for the highest education level achieved by household members aged 15 and above.

The LCMS dataset under-represents households with very young children, which is why we relaxed the condition of female households to have at least three children due to under-simulation of the benefit with the stricter rule.

It is not possible to confirm the certification of those who are severely disabled or those who are chronically ill and on palliative care. We therefore assume these individuals are captured by our demographic variable for disability, *ddi*.

The SCT also includes a community validation process in all Community Welfare Assistance Committees and the community validation of potential beneficiaries after the living conditions test. It is not possible to simulate this.

**Source of information**

- Information provided by Bernadette Malungo (SCT Programme Manager, Department of Social Welfare, MCDSS)
- MCDSS (2018): *Social Cash Transfer Guidelines*
- Department of Social Welfare (2016): *Status of SCT*

### 2.4.2  COVID-19 Emergency Cash Transfer (C-ECT) (bsacv01_s)

The C-ECT was introduced on 28th July 2020 in 22 districts (Chilanga, Chililabombwe, Chingola, Chipata, Chirundu, Chisamba, Kabwe, Kafue, Kalulushi, Kasama, Kazungula, Kitwe, Livingstone, Luangwa, Lusaka, Mansa, Mongu, Mpika, Mufulira, Nakonde, Ndola, and Solwez) in response to the COVID-19 pandemic. It is a joint initiative between the UN agencies in Zambia and the Zambian government through the Ministry of Community Development and Social Services (MCDSS).

**Eligibility conditions**

There are two strands to the C-ECT eligibility:

**Vertical expansion**: Households already receiving SCT are automatically eligible for the C-ECT under the 'vertical expansion' element of the C-ECT programme design. As such, the only eligibility criterion for receiving the C-ECT under the 'vertical expansion' element of the programme is current receipt of SCT.

**Horizontal expansion**: Second, certain types of non-SCT beneficiary households are eligible for the C-ECT under the 'horizontal expansion' element of the C-ECT programme. This horizontal expansion is particularly focused on vulnerable households working in the informal sector, orphans and vulnerable children, persons with disability or illness, households with a member of 65 years or older, female-headed households with at least two children.

**Income test**

There is no income test for this benefit (although the living conditions index is, in effect, a proxy means test).

**Benefit amount and duration**

Beneficiary households receive ZMW 400 per month for a period of six months.

**MicroZAMOD notes**

The policy is simulated for six months if the FYA switch is switched on.

It has not been possible to confidently ascertain details of how the 'horizontal expansion' element of the C-ECT programme is operationalised. However, it needs to be noted that most of the additional target groups of the horizontal expansion are also already targeted by SCT eligibility criteria (e.g. persons with disability or illness and elderly population).

**Source of information**

- MCDSS (2021a, b): COVID-19 emergency cash transfer infographic and brochure

### 2.4.3 Supporting Women's Livelihood Programme (SWL) (bsawo_s)

The Supporting Women's Livelihood Programme supports poor women in Zambia with livelihood packages, including life and business skills training, mentorship, and support to form savings groups. The programme is administered by the Ministry of General Education and the Ministry of Gender and is a component of the Girls Education and Women's Empowerment and Livelihood (GEWEL) Project.

It was introduced in 2015 and the first payment made in 2017. Over the years, the programme was rolled out to 64 districts and aims to reach women in 81 districts of Zambia by 2024.

**Eligibility conditions**

Women living in SCT beneficiary households:

- aged 19–64;
- who are fit for work;
- have at least one child under the age of 18 living with them;
- have been residents in the community for at least six months;
- live in a very poor household (do not get enough to eat, frequently beg from their neighbours, survive through piecework, own very little, etc.).

Only one woman living in a male-headed household with two or more women is eligible to participate in the programme. Female-headed households are automatically selected for the programme.

**Income test**

There is no income test for this benefit.

**Benefit amount**

The benefit consists of a one-off payment of US$225, the value in ZMW depends on the current exchange rate (see Table 2.5). The benefit amount was initially paid in two instalments. This has been changed to one instalment during COVID-19 due to safety reasons.

## Table 2.5: SWL benefit amount and US$ exchange rate

|  | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| US$ exchange rate | - | 6.15 | 8.63 | 10.31 | 9.52 | 10.46 | 12.89 | 18.34 |
| Benefit amount in ZMW | - | 1,385 | 1,942 | 2,319 | 2,141 | 2,353 | 2,900 | 4,127 |

Source: World Bank for exchange rate (official exchange rate, ID: PA.NUS.FCRF). Own calculation for benefit amount.

**Benefit duration**

One-off payment. Women can only participate in the programme once.

**MicroZAMOD note**

The Zambian government introduced new districts in 2012 as well as 2018. These districts cannot be identified in the data as it uses the classification applied in the 2010 census. Thus, districts are only included in the programme if the programme is also rolled out to the district where it used to belong prior to the splitting of districts.

Information on 'same district for the last 12 months' is used as a proxy for the residence criteria.

Information on consumption below the extreme poverty line (uprated by consumer price index [CPI] to the respective year) and less than three meals a day is used to identify very poor households.

Fit to work is measured as no disability and chronic illness, aged between 19 and 64, and not in education.

Programme participation in the previous year cannot be considered in the model.

The benefit is simulated for every eligible woman in female-headed households but only for one woman per male-headed households. Female-headed households are defined as headed by an unmarried woman aged 19 to 64. Male-headed households are defined as headed by a man aged 19 to 64 or headed by a married woman aged 19 to 64.

An equivalized household consumption level below the extreme poverty line and having less than two meals a day is used as a proxy for living in a very poor household.

**Source of information**

- Information provided by Nasiba Nyambe (Chief Community Development Officer, MCDSS) and Voster Tembo (SWL programme manager, MCDSS).
- Girls Education and Women's Empowerment and Livelihood Project website: https://projects.worldbank.org/en/projects-operations/project-detail/P151451

### 2.4.4 Keeping Girls in School (KGS) (bed01_s)

The 'Keeping Girls in School' programme is a social safety net programme targeting girls of secondary-school age. The aim of the programme is to keep girls in education through covering their secondary school fees and as a secondary effect to reduce the number of early marriages. The programme is administered by the Ministry of General Education and the Ministry of Gender and is a component of the Girls Education and Women's Empowerment and Livelihood (GEWEL) Project.

The first phase of the programme started in June 2016 (with benefits being paid out in 2017 for the first time) and ended in September 2020. The target of Phase 1 was to pay the school fees for 14,000 girls in 16 districts. After Phase 1, the programme got extended until April 2024 with the aim to reach more girls in more districts (20 new districts) and to provide an additional annual grant to cover other school-related costs such as uniforms or shoes. The selection of the districts is based on extreme poverty ranking.

In 2020, the benefit was available to girls in 29 districts. The additionally targeted districts in 2021 are: Pemba, Shangombo, Isoka, Kawambwa, Luwingu, Rufunsa, Katete, Mpongwe, Serenje, and Zambezi.

**Eligibility conditions**

Girls in grades 8 to 12 (age 14 to 18) living in Social Cash Transfer (SCT) beneficiary households. Every girl in the SCT household is eligible.

**Income test**

There is no income test for this benefit.

**Benefit amount**

The programme provides a payment voucher for girls which covers their school fees. School fees are paid for day school and boarding school. The monetary value of the benefit in-kind varies between districts and type of school. From 2021 onwards, each girl additionally receives a lump-sum equivalent of 15 per cent of the annual SCT amount for school-related incidentals (uniforms, shoes, etc.).

**Benefit duration**

The support is provided until the girls leave the school.

**MicroZAMOD note**

Most girls attend day schools. Girls in boarding schools might furthermore not be included in the household survey. Thus, we simulate vouchers for day schools only and assume a benefit amount of ZMW 900 per year (which is the median value of the school fees in the targeted schools in 2020). Data on school fees are not available for other years, which is why we assume that fees have remained constant.

The benefit is simulated for girls in government or community schools only.

Some districts only cover a smaller number of girls. Given that it is difficult to simulate the benefit for a small number of recipients, we exclude every district with less than 100 beneficiaries.

**Source of information**
- Information provided by Bernadette Malungo (SCT Programme Manager, Department of Social Welfare, MCDSS).
- Girls Education and Women's Empowerment and Livelihood Project website: https://projects.worldbank.org/en/projects-operations/project-detail/P151451

### 2.4.5 Community Skills Development and Training (CST) (bed02_s)

The Community Skills Development and Training programme provides an opportunity for beneficiaries to acquire the certified trade test level 3. This enables them to acquire trade-tested skills for them to be engaged in an income-generating activity such as bricklaying, tailoring, and others. The programme is administered by the Ministry of Community Development and Social Welfare and the training provided by the ten skills training centres of the ministry (provincial centres).

It is a six-month programme that is currently implemented in Mansa, Mungwi, Kabwe, Masaiti, Mongu (Namushakende), Lundazi, Katete, Solwezi, Monze, Gwembe, and Livingstone districts.

**Eligibility conditions**

The programme targets vulnerable youth living in vulnerable households who are aged between 15 and 35. Vulnerable youth is defined as school dropouts, people with incomplete education or no education at all. Vulnerable households are defined as households receiving SCT as well as households with less than a dollar a day, i.e. households not able to pay for the training themselves.

The programme is advertized in the community through the community development assistants and households self-report if they want to participate.

**Income test**

There is no income test for this benefit.

**Benefit amount**

The programme provides a payment voucher which covers the training fees. The monetary value of the benefit in-kind is ZMW 3,000 per student for the six-month training duration.

**Benefit duration**

The duration of the training is six months.

**MicroZAMOD notes**

Very poor households are defined as living below the extreme poverty line.

School dropouts or youth without or incomplete education are defined as either having no education or education below grade 4.

Benefit only simulated for individuals who are either unemployed or inactive.

The benefit is switched off in the baseline as the small number of recipients (900 in 2020) is very difficult to simulate. The benefit is furthermore only simulated in 2020 as there is no information available when it got introduced and how the policy changed over time in terms of coverage (districts) and amount.

**Source of information**

- Information provided by Nasiba Nyambe (Chief Community Development Officer, MCDSS).

### 2.4.6 Home-Grown School Meal Programme (HGSM) (bedot_s)

This is a district-based programme administered by Zambia's Ministry of General Education. In 2010, the HGSM took over from an earlier supported feeding programme in which food commodities for the school feeding were procured from outside the country. HGSM initially covered 22 districts selected on the basis of a food security measure and education test scores of a particular district. In recent years, the programme has been available in 38 districts (Chadiza, Chama, Chienge, Chilubi, Chirundu, Gwembe, Ikelenge, Kalabo, Kaputa, Katete, Kawambwa, Kazungula, Limulunga, Luano, Lufwanyama, Luwingu, Masaiti, Mkushi, Mongu, Mulobezi, Mumbwa, Mwandi, Mwansabombwe, Mwinilunga, Nalolo, Namwala, Nsama, Nyimba, Petauke, Senanga, Sesheke, Shang'ombo, Shibuyunji, Siavonga, Sikongo, Sinazongwe, Sinda, Vubwi).

All public schools in the eligible district provide daily free school meals to learners, prepared from maize meal, pulses, and oil. The main objective of this programme is to improve attendance in schools, especially for learners from vulnerable and food-insecure households and to reduce poverty among smallholder farmers, at the same time as the HGSM is required to use only locally produced food (GRZ 2019).

**Eligibility conditions**

All public and community-school children from grades 1 to 7 who are currently attending schools in the eligible districts.

**Income test**

There is no income test for this benefit.

**Benefit amount and duration**

Eligible school children receive free school meals daily. The meals are prepared from maize meal, pulses, and oil. The value of the school meals was the equivalent of ZMW 198 per child per year in 2017.

**MicroZAMOD notes**

The correct monetary amounts for the value of the school meals in 2015–16 and 2018–21 are unknown; so, these were estimated by adjusting the 2017 value by the food component of the consumer price index (CPI).

In response to COVID-19, the government announced the closure of all schools on 17 March 2020. It was later announced that only the examination classes would resume on 1 June 2020. The closure of schools also led in the stoppage of the HGSM until all schools were reopened on 21 September 2020. Schools closed again on 17 June 2021 and only reopened on 23 August 2021. Examination classes grades 9 and 12 reopened on 9 August. The closing of the schools is simulated in the model and the duration accounted for in the FYA switch.

Updated information on covered districts is not available which is why we assume that the programme is still rolled out to the 38 districts mentioned above.

**Source of information**

- MGE (2020a): *Financing Framework – Home Grown School Meals Programme in Zambia*

- MGE (2020b): *Cost-Benefit Analysis of the Home-Grown School Meals Programme in Zambia*

## 2.4.7 Food Security Pack (FSP) (bag01_s)

The FSP is a social safety net programme targeting vulnerable and small-scale farming households. The aim of the programme is to ensure food security of vulnerable but viable farmers through an input grant. The programme is administered by the Ministry of Community Development and Social Welfare as well as the Ministry of Fisheries and Livestock in case of the alternative livelihood component and is available in all districts.

It was implemented in November 2000 and designed to target about 20 per cent of the people living in extreme poverty. The FSP received a tenfold increase in its budgetary allocation from ZMW 122 million in 2020 to over ZMW 1 billion in 2021 due to increased negative impact of climate change (droughts and floods in the last two years) and COVID-related problems.

The input grant is complemented by four other components to enhance capacity building and training:

1. Crop diversification and conservation farming;
2. Market entrepreneurship, seed and cereal bank development;
3. Alternative livelihood interventions; and
4. Programme management and coordination.

The implementation in the model focuses on the Food Security Pack itself and its function as a near-cash benefit.

### Eligibility conditions

Viable households are farmers (1) who are able to work but not in any gainful employment, (2) cultivate between 0.5 and 2 hectares of land, (3) and who are living in a household that experiences food insecurity over a prolonged period or suffered negative effects of reduced access to farming inputs over long periods or experienced droughts and floods. They are eligible if their household is also classified as vulnerable fulfilling one of the following criteria:

1. Female-headed households;
2. Child-headed households;
3. Disable-headed households;
4. Aged-headed households (65+);
5. Unemployed-youth-headed households aged between 15 and 35 (unemployed is defined as no employment where they get a monthly income or a sustainable business);
6. Households headed by terminally ill patients;
7. Institutions looking after orphans.

Targeting of beneficiaries is facilitated at the community level by the Area Food Security Committees. In principle, the benefit also targets households on SCT, but some districts do not target households on SCT to avoid multiple support.

### Income test

There is no income test for this benefit.

**Benefit amount**

The programme has three components:

1. *Rainfed cropping*, which relies on rainfall —the pack consists of:
   - **10kg cereal seed (maize, rice, or sorghum): ZMW 360;**
   - **10kg legume (beans, cowpeas, or groundnuts): ZMW 340;**
   - tubers (cassava cuttings, sweet potatoes): ZMW 200;
   - **2 x 50kg compound 'D' fertilizer: ZMW 2,200;**
   - **2 x 50kg Urea fertilizer: ZMW 2,200;**
   - Agriculture lime: ZMW 70;
   - Planting and cultivating tools: ZMW 350;
   - Sprayer: 150 ZMW.

The composition of the FSP varies from season to season due to budget constraints. Items marked in bold are always included in the pack. The monetary value of these four components is ZMW 5,100.

2. *Wetland cropping* implemented in the dry season, which relies on the use of available water points—the pack consists of:
   - 5kg maize seed: ZMW 180;
   - 1 x 50kg compound 'D' fertilizer: ZMW 2,200;
   - 1 x 50kg Urea fertilizer: ZMW 2,200.

Monetary value of the pack: ZMW 4,580.

3. *Alternative livelihood intervention* (ALI), which promotes rearing of small livestock—depending on their suitability, the pack consists of one of the four options:
   - One goat;
   - Two chickens;
   - 1kg fingerlings;
   - One fishing net.

Average monetary value of the animals/fishing net not available.

In principle, all three packs are distributed to the household once a year. Households can receive a crop-based and the ALI packs. However, the ministry is currently not able to fully implement the wetland and ALI packs due to limited budget. Instead, the ALI is partly funded through the loan component of the crop-based pack.

Beneficiaries are obliged to donate 10 per cent of their harvest/production to the community recovery bank or seed bank to re-support the community. Programme participants usually comply with this rule in the first year in order to benefit from the programme for another year. Compliance is less reliable in the second year. In addition, households with low harvest outcome are not asked to repay the 10 per cent as the main target of the programme is to improve the food security of the household. The re-payment usually amounts to ZMW 300 for cereals and ZMW 150 for legume.

**Benefit duration**

The support is provided for two consecutive years. It is expected that the input grant helps households to become food, nutrition, and income secure and to 'graduate' to other social protection programmes, especially the eFISP.

**MicroZAMOD note**

Only the rainfed cropping component is simulated as it is the only one that is currently financed.

The provided cash amounts for the content of the pack includes transportation costs, which leads to an over-simulation of the programme.

The programme is simulated from 2015 onwards holding all rules constant (based on information for 2020) due to lack of information whether the policy has changed over the years.

The 10 per cent donation component is not modelled as it is unclear who manages to have sufficient harvest to have to pay back and who is in the first year and who the second.

Not modelled: households headed by terminally ill patients and institutions looking after orphans.

Not in gainful employment is modelled as not having income from employment, self-employment, or agriculture.

Receipt is restricted to farmers who are not receiving support through the Farmer Input Support Programme.

**Source of information**

- Information provided by John Mwenya (Food Security Pack Coordinator, MCDSS).
- MCDSS (2021c): *Food Security Pack (FSP) Programme*
- FSP presentation for the Social Protection Meeting by Gift Makungu

### 2.4.8 Electronic-Voucher Farmer Input Support Programme (eFISP) (bag_zm)

The Farmer Input Support Programme is administered by the Ministry of Agriculture and aims at improving food security through better access to affordable inputs for small-scale farmers.

The programme was implemented in 2002 as Fertilizer Support Programme and renamed to Farmer Input Support Programme in 2009/10, together with revisions to the programme (lower amounts of fertilizers and seed, higher number of beneficiaries, selection of beneficiaries at the local level). From 2010/11, the kind of crops distributed to farmers have been diversified (from maize to now also including rice, sorghum, cotton, groundnuts, orange maize, soybeans, beans, and sunflower).

Due to high administrative burden, the ministry introduced the eFISP scheme, an electronic voucher system, as a pilot in 2015/16. This allows farmers to source their inputs from local providers instead of waiting for the government to arrange supply and distribution of inputs. The e-voucher is provided to the farmers through VISA bank cards.

The e-voucher was first piloted in 13 districts (in the Southern, Lusaka, Central and Copperbelt Provinces) in 2015/16 and further extended to 39 additional districts in 2016/17. It was rolled

out nationwide the following year but needed to be stopped in some areas due to organizational challenges of the e-voucher system. This concerns about 40 per cent of the beneficiaries who still receive the benefit through direct support—the traditional channels instead of the e-voucher.

**Eligibility conditions**

In order to be eligible for eFISP from the 2015–16 farming season onwards, an individual beneficiary should satisfy the following conditions (GRZ 2015):

- Be a member of a registered farmer organization or be captured in the farmer register;
- Be a small-scale farmer or traditional leader;
- Cultivate between 0.5 ha and 5.0 ha of land; or be raising 2–10 cattle, 5–30 pigs, 5–30 goats, 20–100 chickens, or 1–2 fish ponds;
- Have the capacity to pay the farmer contribution of ZMW 400, and
- Be approved by the Camp Agricultural Committee.

**Income test**

There is no income test for this benefit.

**Benefit amount**

The total amount loaded onto the eFISP in the 2015–16 farming season was ZMW 1,800. However, beneficiary farmers were expected to make a farmer contribution of ZMW 400 before their cards were activated for use. It was therefore necessary to subtract the farmer contribution of ZMW 400 from the voucher value of 1,800, resulting in the actual benefit amount received being ZMW 1400. In the 2016–17 farming season, the voucher amount was increased to ZMW 2,100, but again farmers had to pay an initial ZMW 400 contribution, resulting in a net benefit amount of ZMW 1,700 per eligible farmer.

**MicroZAMOD notes**

It was not possible to model the eligibility criteria related to paying the farmer contribution. All farmers that met the other eligibility criteria were therefore assumed to be able and willing to pay the ZMW 400 contribution to activate the voucher payment. However, receipt is restricted to farmers with market incomes above ZMW 400 per year to make sure that they are able to pay the contribution.

It was not possible to model the eligibility criteria relating to the ownership of livestock due to unavailability of data. These data are, in fact, collected within the LCMS 2015, but it has not yet been possible to obtain them from the Zambian Central Statistical Office (CSO).

It was also not possible to identify traditional leaders.

We simulate eFISP for all districts, even if the government reverted to the system of direct support. This might lead to potential under-simulation of the benefit as the amount that can be bought with the e-card depends on price levels (Mason et. al. 2020), while direct support consists of pre-defined amounts independent of changes in prices.

**Source of information**

- MAL (2015): *Farmer Input Support Programme (FISP): Electronic voucher implementation manual, 2015/2016 agricultural season.*

- Mason et al. (2013): *A Review of Zambia's Agricultural Input Subsidy Programs: Targeting, Impacts and the Way Forward*.
- Harman and Chapoto 2017): *FISP and FRA Reforms: Investing Savings into a Package of Smart Social Protection Schemes for Zambia*.

## 2.5   Social insurance contributions

### 2.5.1   Employee social pension contributions (SP) (tsceepi_s)

All employees in wage employment are liable to pay a pension contribution calculated at 5 per cent of gross salary plus leave pay, overtime, bonus, and all allowances. The other 5 per cent is paid by the employer. The contributions are also subject to a ceiling (see Table 2.6).

### Table 2.6: Contribution ceiling

|  | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| Monthly amount in ZMW | 796 | 796 | 844 | 895 | 995 | 1,073.8 | 1,149.6 | 1,159.4 |

Source: Authors' elaboration of NAPSA (n.d.).

### 2.5.2   Employer social pension contributions (SP) (tscerpi_s)

All employers are liable to contribute 5 per cent of the employee's gross earnings towards their pension. The contribution ceiling also applies to the employer's contributions.

### 2.5.3   Employee National Health Insurance Scheme contributions (NHIS) (tsceehl_s)

In 2018, the government enacted the National Health Insurance Act No. 2 in a bid to achieve universal health coverage. The Act led to the establishment of the compulsory National Health Insurance Scheme (NHIS) managed by the National Health Insurance Management Authority (NHIMA). It was operationalized in October 2019. By September 2020, 540,000 beneficiaries had been registered. A total of 126 health facilities nationwide had also been accredited during the same period.

All employees in wage employment are mandated to contribute 1 per cent of their gross monthly earnings towards the National Health Insurance Scheme.

### 2.5.4   Employer National Health Insurance Scheme contributions (NHIS) (tscerhl_s)

All employers are mandated to contribute 1 per cent of their employees' gross monthly earnings towards the National Health Insurance Scheme.

### 2.5.5   Self-employed National Health Insurance Scheme contributions (NHIS) (tscsehl_s)

Self-employed persons are also mandated to contribute 1 per cent of their gross monthly earnings.

**MicroZAMOD notes**

The contribution is modelled in MicroZAMOD but switched off due to high over-simulation, given that the government relies on self-assessment leading to a relative high level of non-reporting.

## 2.6 Personal income tax (tin_s)

### 2.6.1 Tax unit

Personal income tax is levied on an individual basis. There is no joint taxation.

### 2.6.2 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)'. In Zambia, these include Labour Day awards, ex-gratia payments, medical expenses, funeral expenses, sitting allowances for councillors, and benefits that cannot be converted into cash.

### 2.6.3 Tax allowances

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

In addition to social insurance contributions, there is a tax allowance for disabled persons of ZMW 600 per month. To be eligible for the disability allowance, one must be certified by the Zambia Agency for Persons with Disabilities (ZAPD).

### 2.6.4 Tax base

The tax base is defined as taxable income minus contributions to pension and health insurance as well as tax allowances.

Taxable income includes income from employment, self-employment, property, and capital. The income tax bands changed between 2010 and 2015, between 2016 and 2017 including changes in the highest tax rate, and between 2020 and 2021. The following tax schedules in Table 2.7 apply:

**Table 2.7: Income tax bands and tax rates (in yearly ZMW)**

|  | 2010 |  | 2015-2016 |  |
|---|---|---|---|---|
| 1st band | 0–9,600 | 0% | 0–36,000 | 0% |
| 2nd band | 9,601–16,020 | 25% | 36,001–45.600 | 25% |
| 3rd band | 16,021–49,200 | 30% | 45,601–70,800 | 30% |
| 4th band | >49,200 | 35% | >70,800 | 35% |
|  | 2017-2020 |  | 2021 |  |
| 1st band | 0–39,600 | 0% | 0–48,000 | 0% |
| 2nd band | 39,601–49,200 | 25% | 48,001–57.600 | 25% |
| 3rd band | 49,201–74,400 | 30% | 57,601–82,800 | 30% |
| 4th band | >74,400 | 37.5% | >82,800 | 35% |

Source: ZRA (2011; 2015b; 2017b; 2021).

**MicroZAMOD notes**

The ZMW 600 per month allowance for disabled people for personal income tax purposes is not implemented in the model because of the requirement that the eligible person be certified by

ZAPD and this information is not captured in the data. Awarding the allowance to all disabled people would greatly inflate the numbers eligible for the allowance.

Furthermore, the LCMS dataset does not contain information on expenses from the incomes of self-employed individuals. The 2014 LFS does, however, ask about the cost of business expenses incurred in running the respondent's main business activity. Based on this information, we assume that self-employed liable to presumptive tax do not pay income tax on their self-employment income, while those not liable to presumptive tax do.

## 2.7 Indirect taxes

Indirect taxation in Zambia includes VAT as well as excise duty on certain goods. The standard rate of VAT is 16 per cent and there are a number of exempted and zero-rated goods and services. VAT-exempted goods and services include, for example, water supply, health and education, books and newspapers, as well as a number of agricultural and food products. Zero-rated goods include exports and, for example, building supplies, medical supplies, agricultural equipment, and energy-saving appliances equipment and machinery (ZRA 2014). The list of items that are exempt or zero-rated remained constant between 2015 and 2019, but in 2020 two items were reclassified from 'standard rated' to 'exempt': green maize and paraffin.[5]

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 also imputed and a number of other variables were constructed (see Data Requirement Document[6]).

Excise duty is applicable to various goods. The excise duty rates are presented in Table 2.8.

### Table 2.8: Selected excise duty rates (2018)

| Commodity | Rate |
| --- | --- |
| Clear beer | 40% |
| Opaque beer | ZMW 0.15/litre |
| All types of wines | 60% |
| Spirits, liqueurs, and other spirits beverages[a] | 60% |
| Cigars, cheroots, cigarillos, and cigarettes of tobacco substitutes | ZMW 240/1,000 pieces |
| Petrol | ZMW 1.142/litre |

Note: [a]Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80 per cent.

Source: ZRA (2017a).

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[5] **VAT Liability Guide, available at: https://www.zra.org.zm/wp-content/uploads/2020/07/VAT-Liability-Guide-2020-1.pdf (accessed 24 November 2020).**

[6] **Available upon request from UNU-WIDER.**

**MicroZAMOD notes**

Excise duty has been simulated for alcohol, tobacco, and petrol/diesel.

## 2.8    Turnover tax (ttn_s)

This tax is applied on the annual turnover of self-employed people whose turnover falls below the threshold of ZMW 800,000.

Prior to 2017, this tax was applied at a flat rate of 3 per cent on the annual turnover of self-employed people whose turnover falls below the threshold of ZMW 800,000.

In 2017, the tax schedule for turnover tax was changed so that people were placed into bands according to their reported turnover (below ZMW 800,000 per year) and the amount of turnover tax payable was related to the band to which the person was allocated.

In 2019, the turnover tax schedule returned to being a flat rate, this time at 4 per cent of the annual turnover for people whose turnover falls below the threshold of ZMW 800,000.

# 3    Data

## 3.1    General description

MicroZAMOD is underpinned by the 2010 and 2015 Living Conditions Monitoring Survey (LCMS). The description of the data provided here relates to the 2015 LCMS (CSO 2016) (Table 3.1). The 2015 LCMS was conducted in April/May 2015 and covered 12,251 households in 664 randomly selected enumeration areas across the ten provinces of Zambia. The survey estimated a total population of 15.5 million, with 58.2 per cent of the population residing in rural areas. It estimated a total of 3,014,965 households, with an average household size of 5.1 persons. The survey was designed to produce reliable estimates at national, provincial, and residence (rural/urban) levels.

**Table 3.1: MicroZAMOD database description**

| Original name | Living Conditions Monitoring Survey |
| --- | --- |
| Provider | Central Statistical Office |
| Year of collection | 2015 |
| Period of collection | April/May2015 |
| Income reference period | 2015 |
| Sample size (households) | 12,251 |
| Response rate | 98% |

Source: Authors' compilation.

The response rate, as measured by the proportion of successful interviews from the originally selected households, was 98 per cent. Non-responding households were systematically replaced. In total 12,251 households, with 62,880 individuals, were successfully interviewed.

The household response rate was calculated as the ratio of selected households with completed interviews over the total number of households originally selected. The household selection technique allows for a systematic method of replacing non-responding households.

Households are defined as a group of persons who normally eat and live together. They may or may not be related by blood but make common provision for food and other essentials. The household head is identified by the household as the person who normally makes day-to-day decisions concerning the running of the household. Households with a child head are also captured in the data: examination of the data reveals that just 4 of the 12,251 household heads (<0.1 per cent) are aged below 18 years.

The 2015 LCMS data are not publicly available but can be obtained from the CSO, subject to providing a letter outlining the purpose of study and gaining approval from the director. The survey was undertaken in English and there is a 'Survey Report' in English. The data were not supplied with metadata; however, data dictionaries are available from the CSO and International Household Survey Network websites (see CSO 2017; IHSN 2017). CSO staff can also be contacted for further information on the data. In general, the variables are labelled, and the variable names refer to the section/question number.

The data files contain weights. The sampling weights were defined as the inverse of the product of the two selection probabilities employed at each stage of selection. The weights were adjusted using population projections at district level for 2015.

## 3.2   Data adjustment

### 3.2.1   Household unique identifier

The original identifier for households, *ParentId1*, was found to be unique. This identifier consisted of a combination of 33 characters and numbers. To aid interpretation during the data preparation process, a new numeric unique household identifier was created ranging from 1 to 12,251.

### 3.2.2   Demographic variables

The variable 'age' in the LCMS was recorded either as years or months, as specified using the age code. Therefore, where appropriate, ages recorded in months were converted to years. However, the data preparation work revealed a number of instances of probable miscoding of the age code variable, where respondents' age values had been coded as 'months' yet other variables suggested that the correct age code should have been 'years', and vice versa. These probable errors were manually adjusted.

There is a variable in the LCMS denoting the respondent's stated relationship to the nominated head of household. The relationship information is needed primarily to inform decisions concerning the *idpartner*, *idfather*, and *idmother* variables. Checks confirmed that every household contains one (and only one) head of household. As part of the data preparation process, a new category of 'relationship to head' was created for households with plausible polygamous marriage structures whereby the principal spouse is identified as 'spouse' and additional spouses are classified as 'second, third, etc. wives'.

The *idpartner*, *idfather*, and *idmother* variables were derived using the relationship-to-head variable. These variables could only be derived for respondents who had one of these direct

associations with the head of household. No other intra-household relationship information is contained within the LCMS. In light of the lack of more detailed relationship information, any 'loose children' present within a household were assigned to the head of household (and their spouse, if present).

Anyone below 16 years is a minor; marrying someone below 16 years is an offence and sex with a minor is a serious crime punishable by imprisonment of up to 25 years. Marriage between people below 16 years was considered void and all missing marital statuses for children aged 0–15 years were recoded as 'never married'.

### 3.2.3 Labour market variables

Occupation: Following the one-digit classification as per EUROMOD convention, the variable *loc* was created on the basis of the first digit of the four-digit ISCO code in the 2015 LCMS. Labour market variables are defined as follows:

> 1 = Legislators, senior officials, and managers
> 2 = Professionals
> 3 = Technical and associate professionals
> 4 = Clerical support workers
> 5 = Service and sales workers
> 6 = Skilled agricultural, forestry, and fishery workers
> 7 = Craft and related trade workers
> 8 = Plant and machine operators and assemblers
> 9 = Elementary occupations
> 0 = Armed forces occupation
> −1 = Not applicable

### 3.2.4 Households/individuals dropped from original

One household was identified with no information other than household identification characteristics and was dropped. As the household did not have a weight either, there was no need to make adjustments to the weights after it was dropped.

### 3.2.5 Income amounts

Each income variable was assessed in terms of its distribution and the effects of any outliers. Where relevant, incomes were capped to minimize the effect of outliers. Two income categories were capped at the 99th percentile value (*ypr*, *yiyit*); one was capped at the 90th percentile value (*ypp*); four were capped at particular numeric values (*yse*, *yiy*, *yot*, *yag*); and three were not capped at all as the distributions looked plausible (*yem*, *ytn*, *ypt*).

### 3.2.6 Expenditure/quantity values

As noted above, the excise duty policy consists of a combination of ad valorem calculations and quantity-based calculations. For those items on which excise duty is calculated based upon quantity purchased, it was necessary to refer to the variables in the 2015 LCMS that related to 'quantity' and 'unit'. By using the quantity and unit variables in conjunction it was possible to derive a 'standardized quantity' value per item per household. By then using the standardized quantity variable in conjunction with the 'monthly expenditure' variable it was possible to derive a 'price per unit purchased', per item and per household. Analysis of the price per unit revealed

vast differences between households. This suggests that one or more component of the calculations (monthly expenditure, quantity, unit) captured in the 2015 LCMS is unreliable. It is not possible to ascertain with any confidence which of the components is unreliable, so the decision was taken to treat monthly expenditure as reliable and to impute an 'adjusted standardized quantity' based upon a combination of the reported monthly expenditure and 'average prices' for the relevant expenditure items for 2015, sourced from external statistics. This is the same approach that was adopted with the 2010 LCMS data preparation.

### 3.2.7  Income shocks resulting from the COVID-19 pandemic

Policy systems for years 2015–20 in MicroZAMOD v2.12 use survey data from the 2015 Living Conditions Monitoring Survey (LCMS). This means that incomes and consumption expenditures in the 2020 policy system are not adjusted downwards automatically despite the economic shock resulting from the COVID-19 pandemic.

For the courtesy of the user, MicroZAMOD v2.12 includes a new definitional policy, 'lma_zm', that applies relevant shocks to incomes 'on-model' in 2020. When the policy is set 'on' (default in the 2020 policy system), a portion of workers in each industry transitions from paid employment to unemployment with zero market income. Household consumption expenditures are adjusted downwards accordingly based on absolute reductions in disposable income (see Section 3.5).

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

Note that the GDP shocks capture not just the pandemic but also other industry-level economic developments that took place in 2020 and deviated from pre-pandemic trends. Accordingly, the related labour market transitions and shocks apply to the entire year of 2020. It is therefore recommended that, when running the model with the 'lma_zm' policy turned 'on', the user also turns 'on' the full-year adjustment switch for the 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, 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 and consumption 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 MicroZAMOD is based on several assumptions, equivalent in all SOUTHMOD models, that the user is free to amend.[7]

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[7] **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**

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

**Table 3.2: Transition shares from paid employment to unemployment with no market income, 2020**

| Industry no. (lindi00) | Industry | Transition share |
|---|---|---|
| 1 | Agriculture, forestry and fishing | 0 |
| 2 | Mining and quarrying | 0 |
| 3 | Manufacturing | 0.04663 |
| 4 | Electricity and gas | 0.01492 |
| 5 | Water supply and sewerage | 0.00724 |
| 6 | Construction | 0.04959 |
| 7 | Wholesale and retail trade | 0.14466 |
| 8 | Transportation and storage | 0 |
| 9 | Accommodation and food services | 0.25042 |
| 10 | Information and communication | 0.05812 |
| 11 | Financial and insurance activities | 0.01081 |
| 12 | Real estate activities | 0 |
| 13 | Professional, scientific and technical activities | 0 |
| 14 | Administrative and support services | 0.01563 |
| 15 | Public administration and defense | 0.56789 |
| 16 | Education | 0.19747 |
| 17 | Human health and social work | 0.01136 |
| 18 | Arts, entertainment and recreation | 0.73728 |
| 19 | Other service activities | 0 |

Source: Authors' elaboration of data from the Zambia Statistics Agency (Monthly Bulletins up to vol. 217, April 2021).

## 3.3   Imputations and assumptions

### 3.3.1   Time period

The reference period for all the variables in the input dataset is 2015.

### 3.3.2   Gross incomes

Income data in the original sample were reported as gross.

## 3.4   Updating

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

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can change the related parameters or rely on alternative assumptions. Lastly, any sector-level positive shocks are not taken into account.

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 are shown in Table 3.3.

**Table 3.3: Raw indices for deriving MicroZAMOD uprating factors**

|  | 2010 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|
| $f_CPI_overall | 107.93 | 151.46 | 183.31 | 195.82 | 210.35 | 228.54 | 264.94 | 330.12 |
| $f_CPI_food | 106.26 | 146.04 | 183.03 | 193.61 | 208.21 | 227.37 | 264.47 | 346.98 |
| $f_CPI_non_food | 109.85 | 157.68 | 183.63 | 198.37 | 212.81 | 229.87 | 265.47 | 310.87 |
| $f_CPI_alc_tob | 103.04 | 155.05 | 173.16 | 179.39 | 189.23 | 200.78 | 222.56 | 249.49 |
| $f_CPI_transport | 113.77 | 169.12 | 187.33 | 206.95 | 226.33 | 274.82 | 371.95 | 438.90 |

Note: values refer to the June CPI of the respective year.

Source: Authors' compilation and Zambian Central Statistical Office (for CPI data).

Earlier versions of MicroZAMOD, up to and including version 2.4, used a wage inflator derived from successive waves of the Labour Force Survey to uprate incomes from employment and self-employment. However, due to concerns over the comparability of successive waves of the Labour Force Survey, MicroZAMOD version 2.5 and more recent version revert to using the overall CPI as the basis for uprating incomes from employment and self-employment (as has always been the case for all other income sources in MicroZAMOD).

MicroZAMOD v2.12 automatically updates any monetary values in the input data using CPI. In addition, the 'lma_zm' policy, described in Section 3.2, adjusts the input dataset to account for shocks on market incomes and the labour market situation resulting from the COVID-19 pandemic in 2020.

## 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).

# 4    Validation

## 4.1    Aggregate validation

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

### 4.1.1    Validation of incomes inputted into the simulation

The actual macro-validation tables are included in the Annex. Comments are made here on the main results with reference to the tables in the Annex.

*Number of people employed and unemployed in the input dataset*

Table A1 in the Annex presents the number of paid employees, self-employed, and unemployed persons as calculated using the 'main economic activity' question in the 2015 LCMS. No alternative external validation statistics are currently available.

*Number of people receiving different kinds of market income in the input dataset*

Table A2 in the Annex presents the number of individuals reporting receipt of each of the listed income sources in the 2015 LCMS. No alternative external validation statistics are currently available.

*Aggregate amounts of different kinds of market income reported in the input dataset*

Table A3 in the Annex presents the aggregate annual amounts of various types of market income in the input dataset. No alternative external validation statistics are currently available.

*Number of people receiving different types of non-simulated benefits and number of payers of non-simulated taxes in the input dataset*

It was not possible to obtain these statistics from the input dataset or to obtain any suitable external statistics. As such, Table A4 in the Annex is left blank.

*Aggregate amounts of different types of non-simulated benefits and non-simulated taxes in the input dataset*

It was not possible to obtain these statistics from the input dataset or to obtain any suitable external statistics. As such, Table A5 in the Annex is left blank.

### 4.1.2    Validation of outputted (simulated) instruments

Table A6 in the Annex presents the number of recipients of various types of simulated benefits/number of payers of simulated taxes in MicroZAMOD. External statistics available to validate the contents of Table A6 relate to beneficiaries of several benefits and contributors to the social insurance pension scheme, for selected years only.

As might be expected, MicroZAMOD over-simulates the number of smaller programmes such as the KGS and the SWL where it is difficult to simulate the small number of recipients based on the relatively broad eligibility criteria. The number of FSP recipients is over-simulated while the number of eFISP recipients is under-simulated. The number of pupils receiving support through the HGSM is under-simulated. The simulation of the SCT fits the external statistics.

MicroZAMOD also over-simulates the number of persons that contribute to the social insurance pension scheme, which is likely due to the fact that MicroZAMOD currently assumes that all persons with employee income (yem) will contribute to the pension scheme, whereas in reality some people in informal employment may not opt to make such contributions. It is possible to simulate SIC for those in formal employment only using the ILO definition (ILO 2018). This definition is however too restrictive for the Zambian context and leads to an under-simulation of contributions if applied (it is switched-off in the model).

Table A7 in the Annex presents the aggregate yearly amounts of various types of simulated benefits/simulated taxes in MicroZAMOD and, where available, compares these against external statistics.

MicroZAMOD simulates about 30 per cent of the external figures for VAT (Ministry of Finance fiscal tables). These figures include the overall VAT revenues in Zambia while MicroZAMOD includes private households only. Similarly, MicroZAMOD simulates only a small share (10 per cent) of excise duty. This is partly explained by the focus on private households as well as the simulation of the most important excise duties only. The same is true for the under-simulation of personal income tax.

There are a number of caveats that should be kept in mind in relation to the tax comparisons:

- *Published data*: Data published on income tax are not sufficiently broken down into the required categories. The Ministry of Finance (MoF) publishes income tax totals for company tax (not relevant here), PAYE, and 'Other income tax—withholding tax' (which includes turnover tax and other income taxes). This means that turnover tax is combined with all other categories of withholding tax in the published data and so it is not possible to compare the simulated outputs with directly comparable categories of published figures for income tax. This was identified by the MoF as being relevant in 2015 due to a particularly high amount of property transfer tax received that year, which is included within the withholding tax reported figure but was not simulated in MicroZAMOD: 'Withholding tax was also higher by 32.9 percent mainly boosted by higher than anticipated property transfer tax collections' (MoF 2016: 29). It is possible that similar issues apply to 2016 to 2019 too, as these external statistics also contain 'Other income tax—withholding tax'. As noted above, no external statistics are currently available for 2020.
- *Missing income data*: The income data contain many missing values and zero values where one might expect there to be positive income values. For example, 21 per cent of individuals reporting themselves as having a labour market status of 'employee' do not report a positive *yem* income. The imputation of missing and implausible income values is being explored as part of an associated piece of SOUTHMOD research, but the results from that imputation process are not included within MicroZAMOD v2.12.

Another caveat is that external statistics on aggregate amounts and number of recipients are not always in line with each other. While the number of SCT recipients fits the external statistics quite well, the annual amount is over-simulated and external statistics vary a lot from year to

year. The same is true for HGSM where the number of recipients is under-simulated, but the aggregate amount is over-simulated.

In relation to pension social insurance contribution, MicroZAMOD simulates 144 per cent of the reported number of contributing employees to NAPSA's scheme in 2015. One possible explanation for an over-estimation of NAPSA contributors is that, in 2015, there were still some active contributors to the LASF and PSPF schemes. MicroZAMOD simulates total employee social insurance pension contributions of ZMW 1,460 million in 2015, which is 115 per cent of the external statistics. It has not been possible to obtain any external validation statistics for pension contributions for 2016–21.

## 4.2 Income distribution

In the 2015 LCMS report (CSO 2016), poverty levels are assessed using two poverty lines: a lower-bound poverty line (or 'extreme' poverty as defined by CSO) and an upper-bound poverty line (or 'total' poverty as defined by CSO, which includes those in 'moderate' poverty as well as those in 'extreme' poverty). CSO bases its poverty measurements on consumption expenditure rather than income, stating that 'household consumption expenditure serves as a useful proxy for household income, which in many cases tends to be under-reported by most households' (CSO 2016: 86). CSO states that '[h]ousehold expenditure for the 2015 LCMS was obtained by adding the various goods and services purchased, consumed from own production and received as gifts. Consumption expenditure of all these goods and services was converted into Zambian Kwacha values, converted into monthly values, and then added together to obtain a measure of monthly household expenditure' (CSO 2016: 88). CSO adopts an 'adult equivalent' approach to equivalizing household consumption expenditures for the purpose of poverty measurement. The lower-bound poverty line in 2015 was ZMW 152 per adult equivalent per month, whereas the upper-bound poverty line in 2015 was ZMW 214 per adult equivalent per month. CSO has not published poverty lines for 2016–19 time points so, for the purpose of these analyses, the 2015 poverty lines have been uprated in line with the overall CPI.

With regard to inequality measurement, the 2015 LCMS report (CSO 2016) presents Gini coefficients based on both consumption expenditure and income. Whereas for poverty rate calculations CSO uses the adult equivalent approach to equivalization, for inequality calculations CSO adopts a per-capita equivalization approach.

The poverty and inequality measures constructed using the simulated outputs from MicroZAMOD and presented in this country report are all based on consumption expenditure. This means that it is possible to compare the poverty and inequality measures on a like-for-like basis. In terms of equivalization scales, MicroZAMOD poverty measures are constructed using CSO's adult equivalent scales whereas MicroZAMOD Gini coefficients are constructed using the per-capita approach adopted by CSO.

### 4.2.1 Income inequality

Table A8 in the Annex compares the Gini coefficient calculated from the MicroZAMOD-simulated output for 2015, with the relevant Gini coefficient presented in CSO's report on the 2015 LCMS data (CSO 2016). Both Gini coefficients are based on per-capita consumption expenditure. It is evident from Table A8 that the Gini coefficient calculated from MicroZAMOD for the year 2015 (Gini = 0.58) is almost exactly the same as the Gini coefficient presented in the

CSO (2017) report for the year 2015. No external statistics are currently available with which to validate the simulated Gini coefficients for 2016–20.

### 4.2.2 Poverty rates

Table A9 in the Annex presents lower- and upper-bound poverty rates for 2015–20 derived from the simulated MicroZAMOD output data. External validation statistics are available for 2015 only (CSO 2016). As noted earlier, the poverty rates presented here are all based on a consumption expenditure basis. In terms of the lower-bound poverty line (i.e. extreme poverty as defined by CSO), the poverty rate for 2015 derived from MicroZAMOD stands at 41.5 per cent compared with 40.8 per cent presented in the CSO (2016) report. As such, the poverty rate from MicroZAMOD is almost the same as the poverty rate from the CSO (2016) report. In terms of the upper-bound poverty line (i.e. total poverty as defined by CSO), the poverty rate for 2015 derived from MicroZAMOD stands at 54.6 per cent compared with 54.4 per cent presented in the CSO (2016) report. As such, the poverty rate from MicroZAMOD is again very close to the poverty rate figure from the CSO (2016) report. No external statistics are currently available with which to validate the simulated poverty rates for 2016–21.

## 4.3   Summary of 'health warnings'

The LCMS data required a degree of cleaning in order to produce the compulsory variables required by the EUROMOD software for MicroZAMOD. Nevertheless, there may be further steps that could be taken in this regard, particularly in relation to the income data.

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

# References

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## Annex

### Table A1: Number of employed and unemployed in Zambia, 2015

| Employment status | Input dataset (2015 LCMS) (A) | External statistics 2015 (B) | Per cent captured (A/B) |
|---|---|---|---|
| Paid employees | 1,030,714 | Not available | Not available |
| Self-employed | 905,451 | Not available | Not available |
| Unemployed | 699,153 | Not available | Not available |

Note: The figures reported in column A are for non-overlapping categories; that is, a person cannot report being both a 'paid employee' and 'self-employed' as the LCMS question asks for 'main economic activity'.

Source: Column A: 2015 LCMS prepared as the input dataset for MicroZAMOD (figures derived from 'main current economic activity' question).

### Table A2: Number of recipients of various types of market income and pensions, 2015

| Income type | Input dataset (2015 LCMS) (A) | External statistics 2015 (B) | Per cent captured (A/B) |
|---|---|---|---|
| Paid employment | 1,008,999 | Not available | Not available |
| Self-employment | 1,931,020 | Not available | Not available |
| Agricultural | 931,287 | Not available | Not available |
| Property | 127,183 | Not available | Not available |
| Pension | 26,635 | Not available | Not available |
| Investment (excluding interest) | 14,254 | Not available | Not available |
| Interest on savings | 41,558 | Not available | Not available |
| Private transfers | 553,590 | Not available | Not available |
| Other non-agricultural sources | 394,455 | Not available | Not available |

Note: Unlike in Table A1, the figures reported in column A are not for non-overlapping categories; that is, it is possible for a respondent to report multiple different income sources.

Source: Column A: 2015 LCMS prepared as the input dataset for MicroZAMOD (figures derived from income source questions).

### Table A3: Aggregate annual amounts of various types of market income and pensions, 2015

| Income type | Input dataset (2015 LCMS) (ZMW million) (A) | External statistics 2015 (ZMW million) (B) | Per cent captured (A/B) |
|---|---|---|---|
| Paid employment | 29,201 | Not available | Not available |
| Self-employment | 11,573 | Not available | Not available |
| Agriculture | 2,027 | Not available | Not available |
| Property | 1,103 | Not available | Not available |
| Pension | 107 | 699 | 0.2 |
| Investment (excluding interest) | 26 | Not available | Not available |
| Interest on savings | 107 | Not available | Not available |
| Private transfers | 2,025 | Not available | Not available |
| Other non-agricultural sources | 1,289 | Not available | Not available |

Source: Column A: 2015 LCMS prepared as the input dataset for MicroZAMOD. Column B: external statistics for pension retrieved from MoF fiscal table (pension fund).

### Table A4: Number of recipients of various types of non-simulated benefits/number of payers of non-simulated taxes (external data not available).

### Table A5: Aggregate yearly amounts of various types of non-simulated benefits/ non-simulated taxes in the input dataset and external statistics (external data not available).

## Table A6: Tax and benefit instruments simulated in MicroZAMOD—Number of recipients/payers, 2015–20

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **MicroZAMOD (A)** | | | | | | |
| SP – employee | 1,008,999 | 1,008,999 | 1,008,999 | 1,008,999 | 1,008,999 | 897,566 |
| SP – employer | 1,008,999 | 1,008,999 | 1,008,999 | 1,008,999 | 1,008,999 | 897,566 |
| NHIS – employee | N/A | N/A | N/A | N/A | N/A | 897,566 |
| NHIS – employer | N/A | N/A | N/A | N/A | N/A | 897,566 |
| NHIS – self-empl. | N/A | N/A | N/A | N/A | N/A | N/A |
| Turnover tax | 2,814,019 | 2,814,019 | 180,602 | 190,202 | 2,813,979 | 2,813,979 |
| Income tax | 316,844 | 372,818 | 398,964 | 349,509 | 399,915 | 360,549 |
| Medical levy | N/A | N/A | N/A | N/A | N/A | N/A |
| VAT (hh) | 2,975,820 | 2,975,820 | 2,975,820 | 2,975,820 | 2,975,820 | 2,975,772 |
| Excise duty (hh) | 433,359 | 433,359 | 433,359 | 433,359 | 433,359 | 433,359 |
| SCT (hh) | 172,364 | 301,192 | 677,805 | 677,805 | 677,805 | 677,805 |
| SWL | N/A | N/A | 13,951 | 28,908 | 38,907 | 53,392 |
| C-ECT | N/A | N/A | N/A | N/A | N/A | 250,941 |
| KGS | N/A | N/A | 62,437 | 62,437 | 62,437 | 62,437 |
| CST | N/A | N/A | N/A | N/A | N/A | N/A |
| HGSM | 617,594 | 617,594 | 617,594 | 617,594 | 617,594 | 617,594 |
| FSP (hh) | 96,989 | 76,823 | 76,435 | 75,640 | 75,216 | 75,083 |
| FISP (hh) | N/A | 862,195 | 869,486 | 875,089 | 883,856 | 880,024 |
| **External statistics (B)** | | | | | | |
| SP – employee | 701,374 | N/A | N/A | N/A | N/A | N/A |
| SP – employer | 701,374 | N/A | N/A | N/A | N/A | N/A |
| NHIS – employee | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – employer | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – self-empl. | N/A | N/A | N/A | N/A | N/A | N/A |
| Turnover tax | N/A | N/A | N/A | N/A | N/A | N/A |
| Income tax | N/A | N/A | N/A | N/A | N/A | N/A |
| Medical levy | N/A | N/A | N/A | N/A | N/A | N/A |
| VAT (hh) | N/A | N/A | N/A | N/A | N/A | N/A |
| Excise duty (hh) | N/A | N/A | N/A | N/A | N/A | N/A |
| SCT (hh) | 180,261 | N/A | N/A | N/A | N/A | 632,377 |
| SWL | N/A | N/A | 12,230 | 17,757 | 41,834 | 39,829 |
| C-ECT | N/A | N/A | N/A | N/A | N/A | N/A |
| KGS | N/A | N/A | 8,818 | 16,160 | 16,564 | 13,514 |
| CST | N/A | N/A | N/A | N/A | N/A | 900 |
| HGSM | 1,023,870 | 1,028,807 | 1,034,617 | 1,073,476 | 1,098,903 | N/A |
| FSP (hh) | 30,100 | 29,930 | 27,620 | N/A | N/A | 48,600 |
| FISP (hh) | 241,000 | 602,521 | N/A | N/A | N/A | 1,024,434 |
| **Per cent captured (A/B)** | | | | | | |
| SP – employee | 1.44 | N/A | N/A | N/A | N/A | N/A |
| SP – employer | 1.44 | N/A | N/A | N/A | N/A | N/A |
| NHIS – employee | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – employer | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – self-empl. | N/A | N/A | N/A | N/A | N/A | N/A |
| Turnover tax | N/A | N/A | N/A | N/A | N/A | N/A |
| Income tax | N/A | N/A | N/A | N/A | N/A | N/A |
| Medical levy | N/A | N/A | N/A | N/A | N/A | N/A |
| VAT (hh) | N/A | N/A | N/A | N/A | N/A | N/A |
| Excise duty (hh) | N/A | N/A | N/A | N/A | N/A | N/A |
| SCT (hh) | 0.96 | N/A | N/A | N/A | N/A | 1.07 |
| SWL | N/A | N/A | 1.14 | 1.63 | 0.93 | 1.34 |

| | | | | | | |
|---|---|---|---|---|---|---|
| C-ECT | N/A | N/A | N/A | N/A | N/A | N/A |
| KGS | N/A | N/A | 7.08 | 3.86 | 3.77 | 4.62 |
| CST | N/A | N/A | N/A | N/A | N/A | N/A |
| HGSM | 0.60 | 0.60 | 0.60 | 0.58 | 0.56 | N/A |
| FSP (hh) | 3.22 | 2.57 | 2.77 | N/A | N/A | 1.54 |
| FISP (hh) | N/A | 1.43 | N/A | N/A | N/A | 0.86 |

Source of external statistics: For pension contributions, data provided by NAPSA for 2015 on request; for SCT, Department of Social Welfare (2016) and provided by MCDSS on request, for SWL and KGS, data provided by MCDSS on request; for HGSM, Ministry of General Education (2020): Financing Framework; for FSP and eFISP, data provided by MCDSS on request.

### Table A7: Tax and benefit instruments simulated in MicroZAMOD—Annual amounts (millions ZMW), 2015–20

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **MicroZAMOD (A)** | | | | | | |
| SP – employee | 1,460 | 1,767 | 1,887 | 2,028 | 2,203 | 2,200 |
| SP – employer | 1,460 | 1,767 | 1,887 | 2,028 | 2,203 | 2,200 |
| NHIS – employee | N/A | N/A | N/A | N/A | N/A | 440 |
| NHIS – employer | N/A | N/A | N/A | N/A | N/A | 440 |
| NHIS – self-empl. | N/A | N/A | N/A | N/A | N/A | N/A |
| Turnover tax | 698 | 845 | 367 | 408 | 1,404 | 1,628 |
| Income tax | 2,429 | 3,807 | 4,379 | 4,059 | 5,686 | 6,328 |
| Medical levy | N/A | N/A | N/A | N/A | N/A | N/A |
| VAT (hh) | 2,490 | 2,940 | 3,156 | 3,388 | 3,690 | 4,286 |
| Excise duty (hh) | 308 | 347 | 354 | 362 | 372 | 390 |
| SCT (hh) | 196 | 435 | 1,002 | 1,002 | 1,002 | 1,002 |
| SWL | N/A | N/A | 32 | 62 | 92 | 155 |
| C-ECT | N/A | N/A | N/A | N/A | N/A | 602 |
| KGS | N/A | N/A | 56 | 56 | 56 | 56 |
| CST | N/A | N/A | N/A | N/A | N/A | N/A |
| HGSM | 92 | 115 | 122 | 132 | 144 | 83 |
| FSP (hh) | 495 | 392 | 390 | 386 | 384 | 383 |
| FISP (hh) | N/A | 1,207 | 1,478 | 1,488 | 1,503 | 1,496 |
| **External statistics (B)** | | | | | | |
| SP – employee | 1,269 | N/A | N/A | N/A | N/A | N/A |
| SP – employer | 1,269 | N/A | N/A | N/A | N/A | N/A |
| NHIS – employee | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – employer | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – self-empl. | N/A | N/A | N/A | N/A | N/A | N/A |
| Turnover tax | 2,561 | 2,737 | 3,270 | 3,800 | 4,551 | 5,494 |
| Income tax | 7,444 | 8,147 | 8,686 | 10,426 | 11,691 | 14,337 |
| Medical levy | N/A | N/A | N/A | N/A | N/A | N/A |
| VAT (hh) | 8,365 | 7,957 | 13,887 | 17,352 | 16,739 | 14,532 |
| Excise duty (hh) | 3,254 | 3,140 | 3,179 | 3,430 | 3,990 | 4,661 |
| SCT (hh) | 123 | 119 | 417 | 454 | 106 | 845 |
| SWL | N/A | N/A | N/A | N/A | N/A | 127 |
| C-ECT | N/A | N/A | N/A | N/A | N/A | N/A |
| KGS | N/A | N/A | N/A | N/A | N/A | N/A |
| CST | N/A | N/A | N/A | N/A | N/A | N/A |
| HGSM | 27 | 59 | 49 | 65 | 19 | N/A |
| FSP (hh) | 25 | 20 | 32 | 50 | 62 | 160 |
| FISP (hh) | 2,118 | 1,902 | 2,801 | 1,675 | 4,568 | 9,848 |
| **Per cent captured (A/B)** | | | | | | |
| SP – employee | 1.15 | N/A | N/A | N/A | N/A | N/A |
| SP – employer | 1.15 | N/A | N/A | N/A | N/A | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| NHIS – employee | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – employer | N/A | N/A | N/A | N/A | N/A | N/A |
| NHIS – self-empl. | N/A | N/A | N/A | N/A | N/A | N/A |
| Turnover tax | 0.27 | 0.31 | 0.11 | 0.11 | 0.31 | 0.30 |
| Income tax | 0.33 | 0.47 | 0.50 | 0.39 | 0.49 | 0.44 |
| Medical levy | N/A | N/A | N/A | N/A | N/A | N/A |
| VAT (hh) | 0.30 | 0.37 | 0.23 | 0.20 | 0.22 | 0.29 |
| Excise duty (hh) | 0.09 | 0.11 | 0.11 | 0.11 | 0.09 | 0.08 |
| SCT (hh) | 1.59 | 3.66 | 2.40 | 2.21 | 9.47 | 1.19 |
| SWL | N/A | N/A | N/A | N/A | N/A | 1.22 |
| C-ECT | N/A | N/A | N/A | N/A | N/A | N/A |
| KGS | N/A | N/A | N/A | N/A | N/A | N/A |
| CST | N/A | N/A | N/A | N/A | N/A | N/A |
| HGSM | 3.41 | 1.96 | 2.48 | 2.03 | 7.70 | N/A |
| FSP (hh) | 19.70 | 19.43 | 12.09 | 7.72 | 6.15 | 2.39 |
| FISP (hh) | N/A | 0.63 | 0.53 | 0.89 | 0.33 | 0.15 |

Note: External data for turnover tax refers to 'other income – withholding tax', data for income tax refers to 'PAYE' only, data for VAT incl. VAT on imports, data for SWL refers to value for productivity grants only, data for HGSM incl. GRZ and WFP funding.

Source of external statistics: For pension contributions, data provided by NAPSA for 2015 on request; for turnover tax, income tax, VAT, and excise duty, MoF fiscal tables; for SCT, FSP, FISP, MoF fiscal tables for 2015–19, data provided by MCDSS for 2020 on request; for HGSM, Ministry of General Education (2020): HGSM Financing framework; for SWL, data provided by MCDSS on request.

## Table A8: Inequality in Zambia, 2015–20

| Gini coefficient | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **MicroZAMOD (A)** | | | | | | |
| Income-based | 0.73 | 0.71 | 0.70 | 0.70 | 0.70 | 0.71 |
| Consumption-based | 0.56 | 0.55 | 0.54 | 0.54 | 0.54 | 0.54 |
| **External statistics (B)** | | | | | | |
| Income-based | 0.69 | N/A | N/A | N/A | N/A | N/A |
| Consumption-based | 0.57 | N/A | N/A | N/A | N/A | N/A |
| **Per cent captured (A/B)** | | | | | | |
| Income-based | 1.06 | N/A | N/A | N/A | N/A | N/A |
| Consumption-based | 0.99 | N/A | N/A | N/A | N/A | N/A |

Source: Panel A: Simulated output from MicroZAMOD v2.12. Panel B: CSO (2016).

## Table A9: Poverty rates in Zambia, 2015–20

| Poverty head-count | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **MicroZAMOD (A)** | | | | | | |
| Income-based lower bound | 65.2 | 64.4 | 63.2 | 63.4 | 64.4 | 66.7 |
| Income-based upper bound | 72.4 | 71.9 | 71.1 | 71.1 | 71.9 | 74.1 |
| Consumption-based lower bound | 42.4 | 39.9 | 38.3 | 38.5 | 39.5 | 41.3 |
| Consumption-based upper-bound | 55.1 | 53.4 | 52.0 | 52.2 | 53.2 | 55.3 |
| **External statistics (B)** | | | | | | |
| Income-based lower bound | N/A | N/A | N/A | N/A | N/A | N/A |
| Income-based upper bound | N/A | N/A | N/A | N/A | N/A | N/A |
| Consumption-based lower bound | 40.8 | N/A | N/A | N/A | N/A | N/A |
| Consumption-based upper-bound | 54.4 | N/A | N/A | N/A | N/A | N/A |
| **Per cent captured (A/B)** | | | | | | |
| Income-based lower bound | N/A | N/A | N/A | N/A | N/A | N/A |
| Income-based upper bound | N/A | N/A | N/A | N/A | N/A | N/A |
| Consumption-based lower bound | 1.04 | N/A | N/A | N/A | N/A | N/A |
| Consumption-based upper-bound | 1.01 | N/A | N/A | N/A | N/A | N/A |

Notes: Lower-bound (extreme only) poverty line (adult equivalent): ZMW 152 per month in 2015; upper-bound (moderate+extreme) poverty line (adult equivalent): ZMW 214 per month in 2015 (CSO 2016: 103). All figures are based on consumption expenditure. Both sets of figures use an adult equivalent method of equivalization, as per the guidance from CSO. The poverty lines for 2016–20 have been derived by inflating the 2015 poverty lines by the CPI.

Source: Panel A: Simulated output from MicroZAMOD v2.12. Panel B: CSO (2016: 105).