# SOUTHMOD

Country report

# Zambia

MicroZAMOD v2.0

2010, 2015-2017

Pamela Nakamba-Kabaso, Shebo Nalishebo, David McLennan, Christine Byaruhanga, Michael Noble, and Gemma Wright and Mari Kangasniemi

December 2017

ZIPAR Zambia Institute for Policy Analysis & Research

saspri

University of Essex

UNITED NATIONS UNIVERSITY UNU-WIDER

## Acknowledgements

The team thank Professor Jukka Pirttilä for his support and comments. Dr Helen Barnes and Ms Michell Mpike (SASPRI) are thanked for their contributions at the start of the project. This working paper draws from and builds on the Kangasniemi et al. (2015) working paper. Preliminary findings from this report were presented at a SOUTHMOD Project Workshop convened by UNU-WIDER on 10–11 October 2016 in Helsinki, Finland and on 4 July 2017 in Maputo, Mozambique.

Corresponding author: Gemma Wright (gemma.wright@saspri.org)

## Please cite as

Nakamba-Kabaso, Pamela, Shebo Nalishebo, David McLennan, Christine Byatuhanga, Michael Noble, Gemma Wright and Mari Kangasniemi (2018). *UNU-WIDER SOUTHMOD Country Report: ETMOD v2.0, 2010, 2015-2017*, UNU-WIDER SOUTHMOD Country Report Series. Helsinki: UNU-WIDER.

## About the project

### SOUTHMOD – simulating tax and benefit policies for development

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

SOUTHMOD models are currently available for Ecuador (ECUAMOD), Ethiopia (ETMOD), Ghana (GHAMOD), Mozambique (MOZMOD), Namibia (NAMOD), Vietnam (VNMOD), South Africa (SAMOD), Tanzania (TAZMOD), and Zambia (MicroZAMOD). SOUTHMOD models are updated to recent policy systems using national household survey data. This report documents 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 1.0 running on EUROMOD software. The report describes the different tax–benefit policies in place, how the microsimulation model picks up these different provisions, and the database on which the model runs. It concludes with a validation of 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', which is part of a larger research project on 'The economics and politics of taxation and social protection'. For more information, see the SOUTHMOD project page.


Information and requests: publications@wider.unu.edu
Typescript prepared by Ayesha Chari.



Katajanokanlaituri 6 B, 00160 Helsinki, Finland

# Contents



## Tables

## Acronyms

| | |
|---|---|
| CSO | (Zambia) Central Statistical Office |
| FISP | Farmer Input Support Programme |
| HGSFP | Home Grown School Feeding Programme |
| LASF | Local Authority Superannuation Fund |
| LCMS | Living Conditions Monitoring Survey |
| NAPSA | National Pension Scheme Authority |
| PAYE | Pay as you earn |
| PSPF | Public Service Pension Fund |
| PWAS | Public Welfare Assistance Scheme |
| SCT | Social cash transfer |
| SEA | Standard enumeration area |
| VAT | Value-added tax |
| ZAPD | Zambia Agency for Person 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 1.1. The selected taxes and benefits that are simulated in MicroZAMOD are described in detail in Section 2. The report also describes the data that underpins 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 (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 2015). 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 (Ministry of Education, Science, Vocational Training and Early Education 2014).

There is no uniform definition of working age. For the purposes of the SCT scheme, working age or fit-for-work individuals are 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 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** (*SCTs*): The SCT programme was initiated as a pilot scheme by Zambia's Ministry of Community Development Mother and Child Health 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. Beneficiary households are entitled to ZMW 90 (~USD 9) per month, which they receive on a bi-monthly basis as a sum of ZMW 180 every 2 months (USD 18). Different eligibility criteria exist for urban and rural areas. Beneficiary households containing one or more disabled members are eligible for double the standard amount (ZMW 360 every 2 months).

1 NAPSA Act, Public Services Pension Fund Act, Local Authorities Superannuation Fund Act, and Pension Scheme Regulation Act.

**Benefit 2** (*Home-Grown School Feeding Programme*, HGSFP): This is a district-based programme administered by Zambia's Ministry of General Education covering 22 districts selected on the basis of a food security measure and education test scores of a particular district. All public schools in the eligible district provide free school meals daily to learners, prepared from maize meal, pulses, and oil. The HGSFP 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 HGSFP took over from an earlier supported feeding programme in which food commodities for the school feeding were procured from outside the country. The HGSFP is required to use only locally produced food; hence, the name of the programme.

**Benefit 3** (*Farmer Input Support Programme*, FISP): This programme is administered by the Ministry of Agriculture and Livestock and is intended to benefit smallholder farmers in order to promote household and national food security by providing access to agricultural inputs. The FISP package consists 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. Efforts have been made to extend the package to non-maize crops. To benefit from this pack, farmers should be actively engaged in farming and have the capacity to cultivate between 0.5 and 5 ha. Eligible farmers should also belong to a farmers' cooperative and be able to pay a 50 per cent share of the subsidised package. During the 2015/2016 farming season, the Ministry of Agriculture implemented the Farmer Input Support Program (FISP) Electronic Voucher. A total of 241,000 farmers across the 13 pilot districts in Southern, Lusaka, Central and Copperbelt Provinces received the input subsidy through pre-paid VISA bank cards rather than receiving physical inputs centrally procured by Government. During the 2016/2017 farming season, the government extended the programme to 39 additional districts covering 602,521 farmers.

**Benefit 4** (*Food Security Pack*): This 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 1 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 head or disabled head. 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** (*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 and AIDS pandemic. Specifically, PWAS is aimed at assisting the most vulnerable in society to fulfil their basic needs—particularly health, education, food, and shelter—in order 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.

**Benefit 6** (*Orphans and Vulnerable Children Bursary*): The bursary 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.

## 1.3 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 three public schemes: the Public Service Pension Fund (PSPF), the National Pension Scheme managed by 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]

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

**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 ceiling for 2017 was ZMW 895 per month. 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. 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 as a result of work-related diseases. 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, s/he 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.

## 1.4 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% 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)

**Tax 3** (*VAT*): VAT on good 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 a number of 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 levy was abolished together with all taxes on interest earned on savings in order to promote a culture of savings and investment.

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

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

# 2 Simulation of taxes and benefits in MicroZAMOD

## 2.1 Scope of simulation

Table 2.1 presents the treatment of benefits in MicroZAMOD. Complete simulation was possible for SCTs. The FISP and HGSFP are not simulated.

FISP is not simulated as it is under review; and HGSFP has not been simulated as it is applied at the district level and the district boundaries changed between the time point of the dataset and the time point for the model (June 2015) and there is no look-up table.

### Table 2.1: Simulation of benefits in MicroZAMOD

| | Variable name(s) | Treatment in MicroZAMOD | | | | Why not fully simulated? |
|---|---|---|---|---|---|---|
| | | 2010 | 2015 | 2016 | 2017 | |
| Social assistance | | | | | | |
| SCT | *bsa_zm* | — | S | S | S | 2010 not simulated because SCT was still not widely scaled up |
| Agriculture benefits | | | | | | |
| | *bedot_zm* | I | I | I | I | |
| Education benefits | | | | | | |
| School feeding programme | *bot_zm* | I | I | I | I | |

Notes: SCT, social cash transfer. LCMS, Living Conditions Monitoring Survey; HGSFP, Home Grown School Feeding Programme. '—' policy did not exist in that year; 'S' policy is *simulated* although some minor or very specific rules may not be simulated; 'I' policy is *included* in the microdata but not simulated. 'I'policy not simulated as no data obtainable.

Source: Authors' compilation.

In Table 2.2, the treatment of taxes and social contributions in MicroZAMOD are presented. Complete simulation for personal income tax, turnover tax, and VAT is possible. Excise duties with a significant impact on individuals are also simulated. Employee contributions to a pension scheme are also possible. Simulation of medical levy is only possible in the baseline year 2010 because it was abolished in 2013.

### Table 2.2: Simulation of taxes and social contributions in MicroZAMOD

| | Variable name(s) | Treatment in MicroZAMOD | | | | Why not fully simulated? |
|---|---|---|---|---|---|---|
| | | 2010 | 2015 | 2016 | 2017 | |
| Taxes | | | | | | |
| Personal income tax | *tin_zm* | S | S | S | S | |
| Presumptive turnover tax | *ttn_zm* | S | S | S | S | |
| Medical levy | *thl_zm* | S | — | — | — | Abolished in 2013 |
| VAT | *tva_zm* | S | S | S | S | |
| Excise duty | *tex_zm* | PS | PS | PS | PS | Simulated for alcohol, tobacco, and petrol/diesel |
| Social contributions | | | | | | |
| Employee pension contribution | *tsceepi_zm* | S | S | S | S | |
| Employer pension contribution | *tscerpi_zm* | S | S | S | S | |

Notes: VAT, value-added tax. 'S' policy is *simulated* although some minor or very specific rules may not be simulated; '—' policy did not exist in that year; 'PS' policy is *partially simulated* as some of its relevant rules are not 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 2010, 2015, 2016 and 2017 time points. There were no changes in the order of simulation between the four periods. Medical levy is only simulated in the baseline because it was abolished in 2013. Employee social contributions are simulated first. Next, turnover tax is simulated for self-employed individuals with annual turnovers below ZMW 800,000. Personal income tax is then simulated for those individuals above the turnover tax threshold and all those eligible to pay personal income tax. SCTs are simulated next, taking into account differences in rural/urban eligibility conditions by simulating separately for each area type. Finally, simulations are undertaken for VAT and excise duties.

**Table 2.3: MicroZAMOD spine: Order of simulation**

| Policy | 2010 | 2015 | 2016 | 2017 | Description of the instrument and main output |
|---|---|---|---|---|---|
| uprate_zm | On | On | On | On | DEF: Uprating factors |
| ildef_zm | On | On | On | On | DEF: Income concepts |
| tudef_zm | On | On | On | On | DEF: Assessment units |
| constdef_zm | On | On | On | On | DEF: Constants |
| poverty_lines_zm | On | On | On | On | INC: Poverty Lines |
| tsceepi_zm | On | On | On | On | SIC: Employee pension contributions |
| tscerpi_zm | On | On | On | On | SIC: Employer pension contributions |
| ttn_zm | On | On | On | On | TAX: Turnover tax |
| tin_zm | On | On | On | On | TAX: Personal income tax |
| thl_zm | On | Off | Off | Off | SIC: Medical levy |
| bsa_rural_zm | n/a | On | On | On | BEN: Social cash transfer – rural areas |
| bsa_urban_zm | n/a | On | On | On | BEN: Social cash transfer – urban areas |
| bedot_zm | n/a | Off | Off | Off | BEN: Farmer input support programme |
| bot_zm | n/a | Off | Off | Off | BEN: School feeding programme |
| tva_zm | On | On | On | On | TAX: VAT |
| tex_zm | On | On | On | On | TAX: Excise duty |
| output_std_zm | On | On | On | On | DEF: Standard output individual level |
| output_std_hh_zm | Off | Off | Off | Off | DEF: Standard output household level |

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

Source: Authors' compilation.

## 2.3 Social benefits and contributions

### 2.3.1 SCT (bsa_s)

SCTs are provided to needy households in rural and urban areas.

**Definitions**

Fit for work: all those members of the household capable of working (i.e. not chronically ill or disabled), aged between 19 and 64 years, and not attending school.

**Eligibility conditions**

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

- Residency test: only households who have been residing in the same catchment area for at least 6 months are eligible.
- Demographic test: only households without fit members or with a ratio of unfit to fit members equal to three or more are eligible (fit are all those members capable of working, who are not chronically ill or disabled, and who are aged between 19 and 64 years and not attending school).

- Living conditions test: households with a living conditions index score (see below) indicating they are relatively better-off are excluded.

These criteria are similar to those used in urban areas, although eligible urban households have to fulfil an additional requirement that the household must contain at least one disabled member of any age. Furthermore, 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 ten variables used for rural areas in the living conditions index are: highest education level achieved by household members 15 years and above, type of toilet used, type of roof in the house, source of lighting, most used cooking fuel, ownership of mattress, ownership of sofa, ownership of television, ownership of clock, and ownership of electric iron.

The ten variables for urban areas are the following: Highest education level achieved by household members 15 years and above, type of dwelling, type of toilet used, type of floor in the house, source of lighting, ownership of bed, ownership of sofa, ownership of computer, ownership of dining table, and ownership of electric iron.

**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 2017, the benefit amount was ZMW 90 per month and paid bi-monthly (so ZMW 180 was paid once every 2 months). Households containing one or more disabled persons received double the amount (i.e. ZMW 360 was paid every 2 months).

**MicroZAMOD notes**

The residence 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 dataset only contains a question about where the person resided 12 months previously and so this criterion was applied instead.

### 2.3.2 Employee social contributions

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. Minimum contribution as at 2017 was ZMW 255 per month. The contributions are also subject to a ceiling, and in 2017 the contribution ceiling was ZMW 895 per month.

### 2.3.3 Employer social contributions

All employers are liable to contribute 5 per cent of the employee's gross earnings towards their pension.

## 2.4 Personal income tax

### 2.4.1 Tax unit

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

### 2.4.2 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.

### 2.4.3 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 contribution to pension calculated at 5 per cent (or ZMW 255, whichever is lower) of the wage income, there is a tax allowance for disabled persons of ZMW 600 per month. To be eligible for the disability allowance, one has to be certified by the Zambia Agency for Persons with Disabilities (ZAPD).

### 2.4.4 Tax base

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

Taxable income includes income from employment, self-employment, property, and capital. The following is the personal income tax schedule for 2015:

- ZMW 0–39,600 per year at 0 per cent
- ZMW 39,601–49,200 per year at 25 per cent
- ZMW 49,201–74,400 per year at 30 per cent
- Above ZMW 74,401 per year at 37.5 per cent.

**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. Using this information, it was determined that expenses for the self-employed (with turnovers greater than ZMW 800,000—the turnover tax threshold, see below) equate to 35.0 per cent of the total turnover. Therefore, net income (i.e. profit) for tax purposes for those self-employed who do not fall within the scope of turnover tax was imputed as 65.0 per cent of their total turnover.

## 2.5 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).

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). w

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

Excise duty is applicable to various goods. The excise duty rates are presented in Table 2.4.

### Table 2.4: Selected excise duty rates (2017)

| Commodity | Rate |
|---|---|
| Clear beer | 40% |
| Opaque beer | ZMW 0.15/litre |
| All types of wines | 60% |
| Undenatured ethyl alcohol of an alcoholic strength by volume of less than 80%, spirits, liqueurs, and other spirits beverages | 60% |
| Cigars, cheroots, cigarillos, and cigarettes of tobacco substitutes | ZMW 240/1,000 pieces |
| Petrol | ZMW 1.142/litre |

Source: ZRA (n.d.).

#### MicroZAMOD notes

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

## 2.6 Other taxes—Turnover tax

This tax is applied on the annual turnover of self-employed people whose turnover falls below the threshold of ZMW 800,000. Previously this tax was applied as a flat rate of 3 percent on the annual turnover of self-employed people whose turnover falls below the threshold of ZMW 800,000. This tax is levied on receipts with no deductions for expenses. It is designed for those small traders who do not keep detailed accounts. There are six bands and the tax schedule is applied as described in table 2.5 below.

### Table 2.5: Turnover tax schedule for 2017

| Monthly runover catagory | Tax payable |
|---|---|
| K0 – K 4,200 | 3% of monthly turnover above K3,000 |
| K4,200.01 – K8,300 | K225 per month + 3% of monthly turnover above K4,200 |
| K8,300.01 – K 12,500 | K400 per month + 3% of monthly turnover above K8,300 |
| K12,500.01 – K16,500 | K575 per month + 3% of monthly turnover above K12,500 |
| K16,500.01– K20,800 | K800 per month + 3% of monthly turnover above K16,500 |
| Above K20,800 | K1,025 per month + 3% of monthly turnover above K20,800 |

# 3 Data

## 3.1 General description

The MicroZAMOD underpinning dataset is drawn from the 2015 Living Conditions Monitoring Survey (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(EAs) across the ten provinces of Zambia. The survey estimated a total population of 15.5 million, with 58.2 percent of the population residing in rural areas. The survey estimated a total of 3,014,965 households, with an average household size of 5.1 persons. The 2015 survey was designed to cover a representative sample of 12,260 non-institutionalised private households residing in both rural and urban parts of the country. A total of 664 Enumeration Areas (EAs) were drawn from a total of 25,600 EAs nationwide. 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/May 2015 |
| **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 originally selected households with completed interviews over the total number of households 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 Zambia Central Statistical Office (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.

Missing values in the dataset supplied had not been imputed.

## 3.2 Data adjustment

### 3.2.1 Household unique identifier

The original identifier for households, *ParentId*, was found to be unique. This identifier consisted of a combination of 33 characters and numbers. To aid interpretation during the date 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*, *idmother*, and *idparent* variables. Checks confirm 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 other spouses are classified as 'second, third etc. wives'.

The *idpartner*, *idfather*, *idmother*, and *idparent* 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 and marrying someone below 16 years is an offence, as 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. These 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

### 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 minimise 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 LCMS 2015 that related to 'quantity' and 'unit'. By using the 'quantity' and 'unit' variables in conjunction it was possible to derive a 'standardised quantity' value per item per household. By then using the 'standardised 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 LCMS 2015 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 standardised 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 LCMS 2010 data preparation.

## 3.3 Imputations and assumptions

### 3.3.1 Time period

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

### 3.3.2 Gross incomes

Income data in the original sample was 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 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 3.2.

**Table 3.2: Raw indices for deriving MicroZAMOD uprating factors**

| | Uprating factors | | | | Income components uprated by the index |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2016 | 2017 | |
| *$f_CPI_overall* | 107.93 | 151.46 | 183.31 | 195.82 | All expenditure and income |
| *$f_CPI_food* | 106.26 | 146.04 | 183.03 | 193.61 | Food expenditure |
| *$f_CPI_non_food* | 109.85 | 157.86 | 183.63 | 198.37 | Non-food expenditure |
| *$f_CPI_alc_tob* | 103.04 | 155.05 | 173.16 | 179.39 | Alcohol and tobacco |
| *$f_CPI_transport* | 113.77 | 169.12 | 187.33 | 187.33 | Petrol and diesel |
| *$f_Earnings_inflator* | 100.00 | 234.86 | 285.18 | 285.18 | Earnings |

Notes: CPI, consumer price index. aDerived through interpolation between and extrapolation of LFS 2008, 2012, 2014 and 2017 data.

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

# 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 subsections. 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 external validation statistics are currently available for the 2015 year.

*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 external validation statistics are currently available for the 2015 year.

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

Table A3 presents the aggregate annual amounts of various types of market income in the input dataset. No external validation statistics are currently available for the 2015 year.

*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 any suitable external statistics to enable these figures to be validated. 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 any suitable external statistics to enable these figures to be validated. 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 differences between the number of recipients of various types of simulated benefits/number of payers of simulated taxes in MicroZAMOD and external statistics. Table A7 in the Annex presents the aggregate yearly amounts of various types of simulated benefits/simulated taxes in MicroZAMOD and external statistics.

In relation to VAT, MicroZAMOD simulates just 17 per cent of the total VAT received by government in 2015. It would never be expected that a household survey would enable the full VAT take to be simulated because VAT is paid from a number of sources that would not be measured in a household survey. However, the figure does seem low and is most likely due to incomplete capturing of VAT-applicable expenditures by households within the LCMS 2015.

In relation to personal income tax, Table A7 shows that 31 per cent of non-company income tax is simulated by MicroZAMOD. However, there are a number of caveats that should be kept in mind:

- **Published data**: Data published on income tax are not sufficiently broken down into the required categories. The 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 is particularly relevant in 2015 as the MoF notes that there was 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).
- **Missing income data**: The income data contain many missing values. For example, 21% of individuals reporting themselves as having a labour market status of 'employee' report zero yem income. Income values could be imputed and this imputation work will be undertaken as part of the 2018 SOUTHMOD work programme.

In relation to the SCT, MicroZAMOD simulations yield 412,493 eligible households in 2015. This is over twice as many households as actually recorded as being in payment in December 2015. This discrepancy is to be expected, given that MicroZAMOD simulates the SCT policy on the basis of a full national roll-out, whereas in reality SCT was only partially rolled out to selected geographical districts as of December 2015. The simulated SCT amounts presented in Table A7 are over three times larger than the actual amounts for 2015 provided by MoF. This is again likely to be due in large part to the assumption of a full national roll-out in MicroZAMOD. However, this may also be due in part to the assumption in MicroZAMOD that all households with a disabled person received double SCT (as per the official eligibility guidance) when, in reality, this

may not have been fully achieved (and/or the disability categorization applied in reality may be more stringent that that applied in MicroZAMOD).

In relation to pensions, MicroZAMOD simulates 144 per cent of the reported number of contributing employees to NAPSA's scheme. 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.

## 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 'Household 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. The CSO has not published poverty lines for 2016 or 2017 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 here 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 equivalisation 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 LCMS 2015 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 (Gini = 0.56) is almost exactly the same as the Gini coefficient presented in the CSO (2017) report (Gini = 0.57). No external statistics are currently available which with to validate the simulated Gini coefficients for 2016 or 2017.

### 4.2.2 Poverty rates

Table A9 in the Annex presents lower- and upper-bound poverty rates for 2015 derived from the simulated MicroZAMOD output data and compared against the poverty rates presented in the CSO (2016) report. Poverty rates from MicroZAMOD are also presented for 2016 and 2017, although no external validation statistics are available for these two later years. 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 June 2015 derived from MicroZAMOD stands at 41 per cent compared with 40.8 per cent presented in the CSO (2016) report. As such, the poverty rate from MicroZAMOD is 0.8 percentage points higher than 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 June 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 just 0.2 percentage points higher than the poverty rate figure from the CSO (2016) report.

## 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 2015 but this was difficult to achieve and has been an iterative process. The work plan for 2018 will include continued validation of the interpretation of the policy rules in MicroZAMOD, with key stakeholders as well as any consequent refinement of the implementation of those rules within MicroZAMOD.

# References


CSO (2012). 'Living Conditions Monitoring Survey Report 2006 and 2010'. Lusaka: Living Conditions Monitoring Branch, Zambia Central Statistical Office (CSO).

CSO (2016). '2015 Living Conditions Monitoring Survey (LCMS) Report'. Lusaka: Zambia Central Statistical Office (CSO).

CSO (2017). Central Statistical Office website. Available at: http://www.zamstats.gov.zam (accessed April 2017).

Department of Social Welfare (2016). 'Status of SCT'. Note dated 25 January.

GRZ (2013). Home Grown School Feeding Implementation Manual for Schools and Districts. Lusaka: Ministry of General Education, Government of the Republic of Zambia (GRZ).

GRZ (2015). Implementation of the Household Living Conditions Index. Lusaka: Ministry of Community Development, Mother & Child Health, Government of the Republic of Zambia (GRZ).

IHSN (2017). International Household Survey Network website. Available at: http://www.ihsn.org (accessed April 2017).

IMF (2015). 'Zambia: Staff Report for Article IV Consultation'. Washington, DC: IMF.

Kangasniemi, M., H. Barnes, G. Wright, and M. Mpike (2015). Tax-Benefit Microsimulation Modelling in Zambia. WIDER Working Paper 2015/121. UNU-WIDER: Helsinki.

MCDMCH (2014). 'National Social Protection Policy'. Lusaka: Republic of Zambia.

Ministry of Education, Science, Vocational Training and Early Education (2014). 'Annual Workplan and Budget'. Lusaka: Republic of Zambia.

MoF (2016). 2015 Annual Economic Report. Lusaka: Ministry of Finance (MoF), Republic of Zambia.

Nalishebo, S., and A. Halwampa (2014). Uncovering the Unknown: An Analysis of Tax Evasion in Zambia. Lusaka: Zambia Institute of Policy Analysis and Research.

NAPSA (n.d.). NAPSA website. Available at: http://www.napsa.co.zm/ (accessed 10 November 2016).

Verbist, G. (2004) 'Redistributive Effect and Progressivity of Taxes: An International Comparison Across the EU Using EUROMOD'. EUROMOD Working Paper EM5/04. Colchester, UK: Institute for Social and Economic Research, University of Essex.

World Bank (2013). 'Using Social Safety Nets to Accelerate Poverty Reduction and Share Prosperity in Zambia'. Human Development Department, Social Protection Unit, Africa Region. Washington, DC: World Bank.

ZRA (n.d.). 'Excise Duty Guide'. Available at: https://www.zra.org.zm/manageUpload.htm?ACTION_TYPE=view&CIRCULAR_KEY=Excise&DOC_ID=999000000001518 (accessed 4 November 2016).

ZRA (n.d). https://www.zra.org.zm/download.htm?URL_TO_DOWNLOAD=//web_upload//Worksheet%20in%20Excise%20Duty%20information%20-%20for%20the%20Website.xlsx (accessed 11th December 2017)

ZRA (2014). 'VAT Liability Guide'. Available at: https://www.zra.org.zm/manageUpload.htm?ACTION_TYPE=view&CIRCULAR_KEY=VAT%20LIABILITY%20GUIDE&DOC_ID=999000000002554 (accessed 4 November 2016).

ZRA (2015). Annual Report 2014. Lusaka: Republic of Zambia.

ZRA (2016). 'Pay As You Earn'. Available at: https://www.zra.org.zm/manageUpload.htm?ACTION_TYPE=view&CIRCULAR_KEY=PAY%20AS%20YOU%20EARN&DOC_ID=999000000002480 (accessed 4 November 2016).

ZRA (2017). Zambia Revenue Authority website. Available at: www.zra.org (accessed April 2017).

# 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 (including farming) | 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: 2010 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, 2015

| Income type | Input dataset (2010 LCMS) (A) | External statistics 2010 (B) | Per cent captured (A/B) |
|---|---|---|---|
| Paid employment | 1,008,995 | Not available | Not available |
| Self-employment (non-agricultural and agricultural) | 2,703,542 | 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 | 553,589 | Not available | Not available |
| Other non-agricultural sources | 394,455 | Not available | Not available |

Notes: [a]This consists of overlapping counts of 1,931,016 persons receiving non-agricultural self-employment income plus 1,056,772 persons receiving agricultural income. 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 be captured in terms of both 'paid employment' and 'self-employment and/or 'agricultural' income if the person does report multiple income sources. The external statistics derived from the LFS were provided for the two broad categories of 'paid employees' and 'self-employed' only, and so it was not possible to disaggregate the 'self-employed' category into agricultural and non-agricultural sub-groups for the external statistics.

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, 2015

| Income type | Input dataset (2015 LCMS) (ZMW million) (A) | External statistics 2015 (ZMW million) (B) | Per cent captured (A/B) |
|---|---|---|---|
| Paid employment | 2,433.41 | Not available | Not available |
| Self-employment (non-agricultural) | 1,079.1 | Not available | Not available |
| Agriculture | 173.8 | Not available | Not available |
| Property | 91.9 | Not available | Not available |
| Pension | 8.9 | Not available | Not available |
| Investment (excluding interest) | 2.1 | Not available | Not available |
| Interest on savings | 8.9 | Not available | Not available |
| Private transfers | 168.8 | Not available | Not available |
| Other non-agricultural sources | 107.5 | Not available | Not available |

Notes: The figure for self-employed income is derived from self-employed turnover as reported in the LCMS. Net self-employed income for those with turnovers over ZMW 800,000 per year is assumed to be 0.650 of self-employed turnover (with ratio derived from LFS), whereas net self-employed income for those with self-employment turnover of less than ZMW 800,000 per year is assumed to be 0.581 of self-employed turnover (with ratio again derived from LFS).

Source: Column A: 2010 LCMS prepared as the input dataset for MicroZAMOD.

## 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, 2015-2017

| Tax–benefit policy | Micro ZAMOD 2015 (A) | External 2015 (B) | Per cent captured (A/B) | Micro ZAMOD 2016 (D) | External 2016 (E) | Per cent captured (D/E) | Micro ZAMOD 2017 (G) | External 2017 (H) | Per cent captured (G/H) |
|---|---|---|---|---|---|---|---|---|---|
| Turnover tax | 2,814,019 | Not available | Not available | 2,814,019 | Not available | Not available | 180,602 | Not available | Not available |
| Personal income tax | 317,503 | Not available | Not available | 373,924 | Not available | Not available | 460,326 | Not available | Not available |
| VAT | 3,043,925 | Not available | Not available | 3,043,739 | Not available | Not available | 3,044,338 | Not available | Not available |
| Excise duty | 428,132 | Not available | Not available | 428,132 | Not available | Not available | 428,132 | Not available | Not available |
| SCT (h/h) | 412,493 | 180,261 | 228.8% | 412,493 | Not available | Not available | 412,493 | Not available | Not available |
| Employee pension contribution | 1,008,999 | 701,374 | 143.9% | 1,008,999 | Not available | Not available | 1,008,999 | Not available | Not available |
| Employer pension contribution | 1,008,999 | 701,374 | 143.9% | 1,008,999 | Not available | Not available | 1,008,999 | Not available | Not available |

Source: Columns A, D and G: MicroZAMOD. V2.0 Column B: For SCT, Department of Social Welfare (2016: 1); for pension contributions, data provided by NAPSA for 2015 on request.

## Table A7: Tax and benefit instruments simulated in MicroZAMOD—Annual amounts (millions ZMW), 2015-2017

| Tax–benefit policy | Micro ZAMOD 2017 (A) | External 2017 (B) | Per cent captured (A/B) | Micro ZAMOD 2016 (D) | External 2016 (E) | Per cent captured (D/E) | Micro ZAMOD 2017 (G) | External 2017 (H) | Per cent captured (G/H) |
|---|---|---|---|---|---|---|---|---|---|
| Turnover tax | 698 | 10,005 | 31% | 845 | Not available | Not available | 367 | Not available | Not available |
| Personal income tax | 2,431 | | | 3,836 | | | 6,252 | | |
| VAT | 1,438 | 8,365 | 17% | 1,708 | Not available | Not available | 1,828 | Not available | Not available |
| Excise duty | 299 | 3,254 | 9% | 336 | Not available | Not available | 343 | Not available | Not available |
| SCT | 463 | 123 | 376% | 595 | Not available | Not available | 595 | Not available | Not available |
| Employee pension contribution | 1,460 | 1,269 | 115% | 1,773 | Not available | Not available | 2,224 | Not available | Not available |
| Employer pension contribution | 1,460 | 1,269 | 115% | 1,773 | Not available | Not available | 2,224 | Not available | Not available |

Notes: [a]This figure comprises 2,561,021,000 for 'Other income tax—withholding tax' plus 7,444,125,000 for 'PAYE', and includes property transfer tax which is not included in Column A. For more details see Section 4.1.2.

Source: Column A, D and G: MicroZAMOD V2.0. Column B: MoF (2016: 28, 30); for pension contributions, data provided by NAPSA for 2015 on request.

## Table A8: Inequality in Zambia (consumption-based), 2015-2017

| | MicroZAMOD 2015 (A) | External statistics 2015 (B) | MicroZAMOD 2016 (C) | External statistics 2016 (D) | MicroZAMOD 2017 (E) | External statistics 2017 (F) |
|---|---|---|---|---|---|---|
| Gini coefficient | 0.56 | 0.57 | 0.55 | Not available | 0.54 | Not available |

Source: Column A, C and E: Gini coefficients calculated using simulated outputs from MicroZAMOD V2.0 for 2015, 2016 and 2017 respectively. Column B: CSO (2016: 82).

## Table A9: Poverty rates in Zambia (consumption-based), 2015-2017

| | Micro ZAMOD 2015 (A) | External statistics 2015 (B) | Ratio (A/B) | Micro ZAMOD 2016 (D) | External statistics 2016 (E) | Ratio (D/E) | Micro ZAMOD 2017 (G) | External statistics 2017 (H) | Ratio (G/H) |
|---|---|---|---|---|---|---|---|---|---|
| Lower-bound poverty line | 41.6% | 40.8% | 1.02 | 41.6 | Not available | Not available | 41.4 | Not available | Not available |
| Upper-bound poverty line | 54.6% | 54.4% | 1.00 | 54.6 | Not available | Not available | 54.6 | Not available | Not available |

Notes: Lower-bound ('extreme' only) poverty line (adult equivalent): ZMW 152 per month; Upper-bound ('moderate + extreme') poverty line (adult equivalent): ZMW 214 per month (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.

Source: Column A, D and G: Simulated output from MicroZAMOD V2.0. Column B: CSO (2016: 105).