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Microsimulation analysis of the impact of indirect tax benefits on income distribution and poverty alleviation in Tanzania

An application of TAZMOD

Asiya Maskaeva, Zanda Bochkaeva, Joel Mmasa, Mgeni Msafiri, and Eric Iramba*

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Abstract: This paper analyses the impacts of indirect tax policy reforms on income distribution and poverty in Tanzania by applying a standard static microsimulation model TAZMOD v1.8. The simulations model two indirect tax reforms involving changes to the excise duty and value-added tax rates on alcoholic beverages and tobacco products, and changes to employers' and employees' contributions to the National Health Insurance Fund. The results of the first reform find a positive effect on government tax revenue and a neutral effect on income distribution and poverty. The results of the second reform find a positive effect on household income distribution and consumption. The findings show that, despite increasing unequal income distribution, poverty indicators fell.

Keywords: income distribution, poverty, tax-benefit reforms, microsimulation
JEL classification: D31, H25, I38

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*University of Dodoma, Dodoma, Tanzania, corresponding author: asiyamask@hotmail.com.

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Information and requests: publications@wider.unu.edu

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Katajanokanlaituri 6 B, 00160 Helsinki, Finland

1 Introduction

Having inadequate revenues for financing development projects and other social expenditures is a challenge for many developing countries. This is an issue for the international development policy agenda, which aims at capacity building developing countries to mobilize tax revenues. Tanzania is one developing country where a number of tax reforms have been undertaken to simplify and improve the fairness, equity, and efficiency of the tax system. Some of the reforms have focused on reducing tax rates, introducing value-added tax (VAT), broadening the tax base, abolishing nuisance taxes, and improving tax administration. As a result of these reforms, the tax revenue to nominal gross domestic product (GDP) ratio increased moderately from 11.3 per cent in 2012/13 to 13.2 per cent in 2016/17. However, this rate is below the average of 16.4 per cent for Sub-Saharan Africa. Moreover, government expenditure rates have continued to surpass domestic revenues, leading to fiscal stress. A reliance on unpredictable donor finances has, in the same way, continued to hinder the realization of development objectives.

Under the implementation of the National Five Year Development Plan (FYDP II) for the period from 2016/17 to 2020/21, the government is aiming both to achieve inclusive economic growth and substantially reduce poverty. Taking these objectives and the challenges underpinning the Tanzanian tax system into account, an understanding of the impacts of different taxes on poverty and income distribution is imperative.

This paper analyses the impacts of indirect taxes on poverty and income distribution in Tanzania using a microsimulation model developed for Tanzania (TAZMOD). In Tanzania, excise duties generate significant amounts of revenue and rank third after VAT and income taxes. They also have a number of advantages: they are easy to administer, can generate high revenue with little discretionary effects, and can be used to discourage the consumption of harmful goods like cigarettes and alcohol, thereby reducing the health expenditure burden on individuals and the government. In addition, the Tanzanian government has been consistently increasing excise duties for some specific commodities by 5 per cent a year to adjust for the inflation rate, since the specific rates do not take account of inflation and thus erode the government revenue.

To this end, this study will specifically attempt to answer the following questions:

1. Do indirect tax benefits have an impact on the income of poor households?
2. How are the fiscal and social shocks transmitted to the poor households?
3. What alternative fiscal policies might be used to ensure a more equitable distribution of income among households?

The findings of this study will act as a guide to policy makers about the consequences of poverty alleviation and income distribution on the Tanzanian mainland.

2 Recent trends in Tanzanian tax revenue

The tax revenue in mainland Tanzania for the fiscal period from 2012 to 2017 is characterized by growth. Total tax revenues increased from TZS7.73 billion (local currency) in the fiscal year 2012/2013 to 14.06 billion in 2016/2017 (Table 1). The average growth in tax receipts was approximately 16 per cent each year. It should be noted that tax revenue growth outpaced economic growth, resulting in a rise in the tax income (the ratio of total taxes to nominal GDP).

However, tax income decreased slightly in 2014/2015, resuming an upward trend in 2015/2016, and reaching 13.2 per cent in 2016/2017.

Table 1: Aggregated budget revenue indicators, selected fiscal years

	2012/013	2013/2014	2014/2015	2015/2016	2016/2017
Total revenue, TZS billion	9.36	10.84	11.39	15.92	16.13
Tax revenue, TZS billion	7.73	9.29	9.89	12.38	14.06
Tax to nominal GDP ratio, %	11.3	12.3	11.6	12.8	13.2

Note: 'TZS' – Tanzanian shillings.

Source: Computed by authors from International Monetary Fund report (IMF 2016) and Tax Statistics Report, 2016/17 (NBS 2018).

Tax revenue in Tanzania is characterized by a fairly stable distribution between direct and indirect taxes. Direct taxes contribute an average of 37.5 per cent and indirect taxes contribute 62.5 per cent to the annual Tanzanian revenues (Table 2).

Table 2: Direct and indirect taxes as a share of tax revenue, selected fiscal years, in per cent

	2013/2014	2014/2015	2015/2016	2016/2017
Direct taxes	40.2	37	36.7	36
Indirect taxes	59.8	63	63.3	64

Source: Computed by the authors from the Tax Statistics Report, 2016/17 (NBS 2018).

The main direct tax contributors in Tanzania are the taxes on the payroll and workforce (PAYE) and taxes on profits (corporate tax). In total, these account for around 75 per cent of total direct taxes (NBS 2018).

An indirect tax is a tax applied to the manufacture or sale of goods and services. There are two types of indirect taxes: ad valorem taxes and specific taxes. A specific tax is imposed on each unit (e.g. TSZ12,447 per thousand cigarettes in Tanzania), while an ad valorem tax is a percentage of the price, for example where a 15 per cent tax is imposed on imported furniture (TRA 2015). The latter is usually collected at a standard rate and can lead to income redistribution because poor households have a higher propensity to consume some goods. To prevent such an effect, the Tanzanian government applies the lower rates to basic-need commodities. For instance, ad valorem rates range from 0 per cent to 50 per cent.

Overall, indirect taxes in Tanzania consist of domestic consumption taxes, international trade taxes, and other taxes and charges (Table 3). The Tanzanian indirect tax structure has a heavy reliance on taxes on international trade. International trade taxes comprise import and excise duties as well as VAT on imports. The share of international trade taxes increased from 60.9 per cent of total tax revenue in 2012/2013 to 62.3 per cent in 2016/17. The average share of domestic consumption taxes (excise duties and VAT on products and services) is 34.3 per cent of indirect taxes. However, the proportion of domestic consumption taxes decreased from 35.1 per cent in 2012/2013 to 34 per cent in 2016/2017 because excise duties on the domestic market decreased over the same period.

Table 3: Central government tax revenue – indirect tax reliance by broad categories, selected fiscal years, in per cent

	Domestic consumption taxes			International trade taxes	Other taxes charges
	VAT on product	VAT on services	Excise duties		
2012/2013	6.2	17.5	11.4	60.9	4
2013/2014	5.8	16.5	12.6	61.4	3.7
2014/2015	6.0	16.4	12.4	61.5	3.7
2015/2016	5.5	16.5	10.4	64.1	3.5
2016/2017	5.1	18.7	10.2	62.3	3.7

Source: Computed by the authors from the Tanzanian Tax Statistics Report, 2016/2017 (NBS 2018).

Excise duties on key commodities are a significant source of government revenue. Most of the revenue from domestic excise taxes comes from telecom services and beer, followed by cigarettes, spirits, and wine (Table 4). The excise taxes on alcoholic beverages and cigarettes are regressive because the poor spend a larger share of their income on them than the rich.

Table 4: Domestic excise taxes on key commodities, selected fiscal years, in per cent

	Telecom services		Cigarettes		Beer		Spirits		Soft drinks		Bottled water	
	A	B	A	B	A	B	A	B	A	B	A	B
2013/2014	3.7	29.2	1.7	13.4	3.1	24.9	1.3	10.6	0.9	7	0.2	1.3
2014/2015	3.7	30.4	2	16.2	3	24.6	1.8	14.3	0.6	4.5	0.2	1.8
2015/2016	2.9	28.5	1.6	15.7	2.6	25	1.2	11.6	0.5	4.8	0.2	1.7

Notes: A – as a share of total indirect taxes, B – as a share of total excise duties.

Source: Computed by the authors from the Tanzanian Tax Statistics Report, 2015/2016 (NBS 2017).

3 Empirical evidence of the indirect tax benefits in the developing world

Consumption of alcoholic beverages and smoking have become very popular worldwide, especially among young people, and household spending on the consumption of alcohol and tobacco products has been increasing in Tanzania. Indeed, the alcoholic drinks sector has grown strongly over the past few years, driven by consumers' rising incomes and increasing investment in the sector. According to one report (BMI 2016), total alcohol consumption will increase by 4.3 per cent between 2013 and 2020. Beer is the fastest-growing alcohol category. Beer consumption accounted for 95 per cent of total alcohol consumption in Tanzania in 2016. This is despite the fact that smoking has been proven to increase the risk of lung cancer and premature death, while a high level of alcohol intake increases the risk of heart, stroke, and vascular disease, as well as liver cirrhosis and certain types of cancer (Brownell et al. 2009; Marr and Huang 2014).

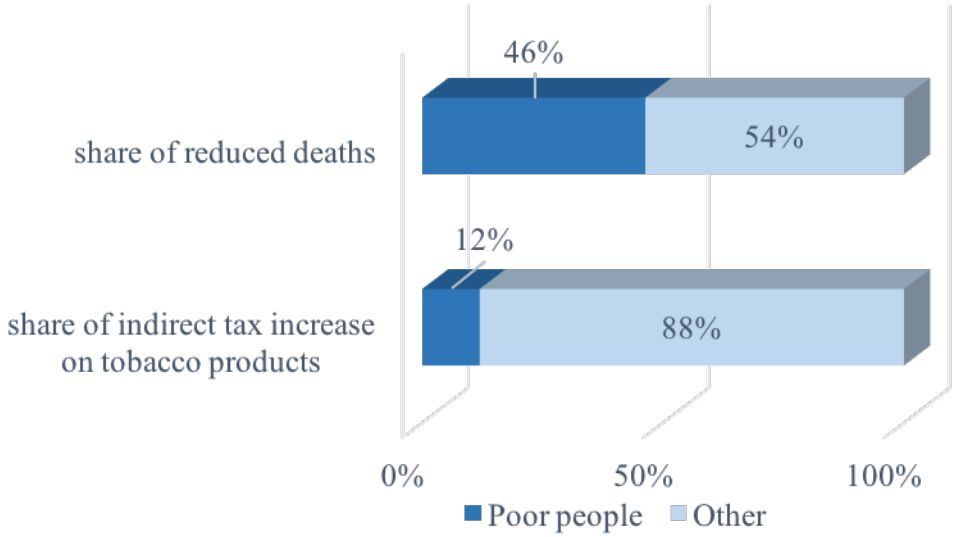
3.1 Indirect benefits of tax on tobacco products

Increasing tobacco taxes has been found to be the best strategy for controlling smoking (Chaloupka et al. 2012). Firstly, as most smokers belong to low- and middle-income groups and are limited financially, they will have to reduce their consumption of cigarettes or quit smoking altogether if tobacco taxes are increased (Marr and Huang 2014). Moreover, as about 80 per cent of adult smokers start smoking when they are under 18 years old, raising taxes is an effective

preventive measure (United States Department of Health and Human Services 2014) for reducing the future number of smokers. This strategy has already been successfully implemented in many countries in Europe and South America. The experience of these countries has shown that raising the cigarette price by 10 per cent results in a 4 per cent reduction in consumption in high-income countries and in a 5–8 per cent reduction in consumption in low- and middle-income groups.

Secondly, revenue from increased taxes allows the government to increase income and direct money to other important health and social projects such as tobacco control, health improvement, and education (Gullus et al. 2014; WHO 2017b). Low- and middle-income groups are the most sensitive to these improvements and, therefore, according to Chaloupka et al. (2012), health and social benefits from increases in tobacco tax are progressive (Figure 1).

Figure 1: Indirect tax benefits from tobacco products in the USA

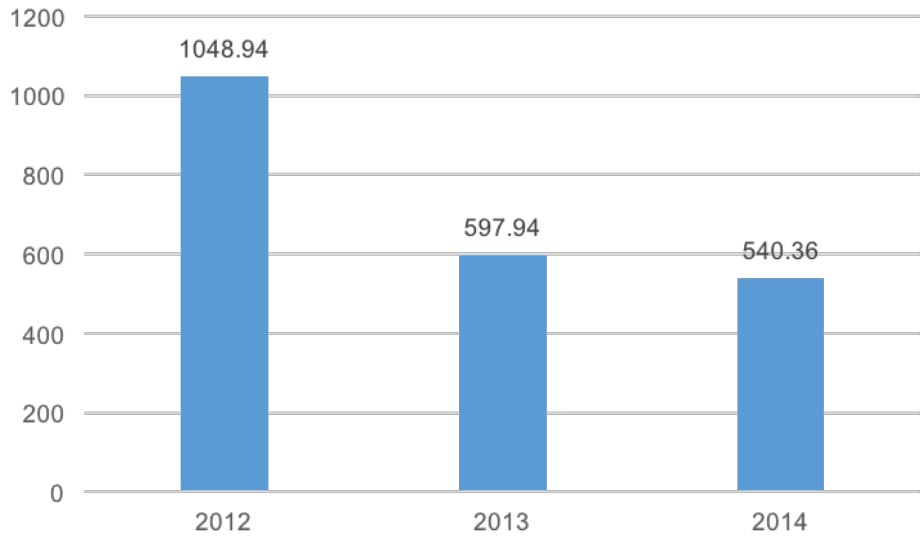


Source: Constructed by the authors using data from Chaloupka et al. (2012).

In 2017, the World Health Organization (WHO) reported that only 32 countries were continuing to increase tobacco taxes. The majority of these were European countries (26), as well as some countries in the Eastern Mediterranean, the Americas, and Africa. This number also included two low- and middle-income countries—Gambia and Argentina (WHO 2017a).

Gambia implemented an annual tobacco tax increase policy in 2013, and since then has demonstrated the best practice of tobacco control through raising tax. Imports of cigarettes decreased as early as 2014, reflecting the decrease in cigarette consumption (Nargis et al. 2016). Yet, while the consumption of cigarettes has declined, total tax revenue has increased almost threefold (Figure 2 and Table 5).

Figure 2: Imports of cigarettes in Gambia, thousand kg



Source: Constructed by the authors using data from Nargis et al. (2016).

Table 5: Gambian government tax revenue: indirect tax reliance on cigarettes, GMD million

	2012	2013	2014
Value-added tax on imports of cigarettes	24.96	51.19	67.76
Excise duty on imports of cigarettes	88.62	166.91	257.69
Indirect tax revenue of imports of cigarettes	148.41	253.53	418.19

Note: 'GMD' – Gambian Dalasi.

Source: Computed by the authors using data from Nargis et al. (2016).

East African countries have only recently started to introduce policies to increase tobacco taxes. For example, following the Excise Duty Act of 2015, Kenya started to increase tobacco prices, but this did not significantly affect tobacco consumption. Studies found that people started to buy individual cigarettes instead of packs (containing 20 cigarettes), which is illegal but not controlled (ILA 2011). However, the price did not increase to 70 per cent, as has been recommended by World Health Organization. In 2007, Tanzania committed to signing an agreement to control the consumption of tobacco in the country, but no significant measure has been implemented as yet. However, there have been some studies related to tobacco taxation in Tanzania.

Simulation analysis based on a two-part demand equation model developed by Kidane et al. (2015) and Kidane et al. (2017) shows the impacts of the excise duty hike for cigarettes on households' consumption and government revenue. The study found that, prior to raising the excise duty on cigarettes, the smoking prevalence was 15.95 per cent and per capita consumption was 1.33 cigarettes per day, implying 24.27 packs per year. Cigarettes account for TZS37.54 billion in the total tax revenues, while total cigarette consumption amounts to 80.8 million packs per year. The post-tax simulation results show that the smoking prevalence will reduce to 15.73 per cent and per capita consumption of cigarettes will fall to 20.06 packs per year, leading to a decrease in the total number of adult smokers in the country from 3.33 million people (before the tax reform) to 3.28 million people. Furthermore, total annual consumption will reduce to 65.8 million packs per year, and tax revenue could be increased to TSZ38.91 billion.

While the percentage of smoking-related deaths is highest in low- and middle-low countries, East African Countries (EAC) have recently started to introduce measures to control tobacco use. It can be seen therefore that fiscal policy in relation to tobacco taxation is not harmonized in the EAC. The final retail price of cigarettes is made up of several components—excise, customs duties, VAT, general sales—but the excise taxes are considered to be the most important for public health issues.

3.2 Indirect benefits of tax on alcoholic beverages

It has been suggested that similar increases to tobacco taxes should be applied to alcohol excise taxes, and for the same reasons. This strategy is likely to improve the public health and social situation in the country. According to a WHO report, 59 per cent of people aged 15 and above consume alcoholic drinks in Africa. As the price increase policy has been proven to be effective in the global anti-tobacco programme, the same approach could be used to reduce alcohol consumption. Economically, excise taxation is the most convenient way to increase the price and raise government revenue. Alcoholic drinks are easy to define, and revenue can be directed to social and health sector issues (WHO 2011).

Worldwide studies have been reviewed when researching the relationship between taxation and alcohol consumption. These studies have generally been found to have mixed results. For instance, Sopek's (2013) study of European Union countries found that taxation on alcoholic beverages has various socio-economic implications. The reason why excise duty is imposed on alcohol in most European countries is to raise the government revenue. The countries that apply the highest excise taxes on alcoholic beverages are Ireland, the United Kingdom, Sweden, and Finland.

Stokłosa et al. (2016) analyse the reasons for the high level of alcohol consumption in Poland, which leads to mortality and morbidity. Alcohol consumption there has also led to the emergence of many preventable non-communicable diseases including cancer and neuropsychiatric disorders and has caused an increase in car accidents. The results show that the affordable price of alcoholic beverages and easy access to alcohol are the main reasons for the country's high level of alcohol consumption. Therefore, raising the price of alcoholic drinks by raising excise tax would have reduced its consumption.

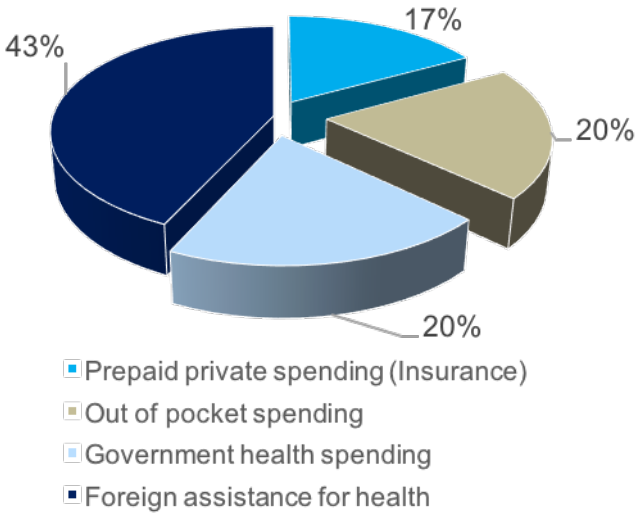
Likewise, a study by Richard Bird (2015) shows that tobacco and alcohol excise taxes have a positive impact on improving public health and government revenue. Tax revenues on alcohol and tobacco can play a significant role in public health objectives through increasing excise duties on these products. This will significantly lead to a reduction in demand for and consumption of alcohol and tobacco products. Furthermore, the tax revenues generated from alcohol and tobacco could address problems in the public health sector by providing funds to finance its expenditures.

4 Health and social assistance schemes in Tanzania

The health sector constitutes the major part of government expenditure in countries across the world, so the health care facilities that are available to households reflect the economic situation in a particular country. Currently, the Tanzanian health sector is mainly supported by foreign donor partners and households' self-payments, both out-of-pocket and pre-paid schemes (Institute for Health Metrics and Evaluation 2016). Pre-paid schemes are still not well developed in the country, and about 60 per cent of the expenditure is covered by global development

assistance for health and households' out-of-pocket payments (Figure 3). Moreover, despite foreign assistance and governmental expenditure, health services are still unaffordable for the majority of Tanzanian citizens (WHO 2010).

Figure 3: Tanzania health spending by source in 2014.



Source: Constructed by the authors using data from Institute for Health Metrics and Evaluation (2016).

4.1 Overview of health care schemes in Tanzania

The health care financing system in Tanzania is defined as mixed—both the government and the patient share the costs of the medical service—and fragmented, as only few communities have access to health care facilities. Several health insurance schemes are currently operating, but WHO reports that less than 15 per cent of people were covered by these schemes in 2013 (WHO 2010). The most distributed and expensive is the National Health Insurance Fund (NHIF). The fund was established in 1999 with the main purpose of providing insurance for governmental and public servants. The Social Health Insurance Benefit (SHIB) provides the National Social Security Fund (NSSF) members with access to a limited number of health care facilities, and the Community Health Fund (CHF) and Tiba Kwa Kadi (TIKA) target low- and middle-income groups of Tanzanians. The CHF was designed to provide a co-finance prepayment scheme of medical insurance for people in rural areas. The CHF membership fee is not fixed and varies from TZS5,000 to TZS20,000 per household each year, depending on the community where the household lives (Chee et al. 2002; Haazen 2012). Although people determine the fee themselves, the majority of households declare that they are unable to pay for their membership (Table 6).

Table 6: Health insurance schemes in Tanzania

	National Health Insurance Fund (NHIF)	Community Health Fund (CHF)/Tiba Kwa Kadi (TIKA)	National Social Security Fund – Social Health Insurance Benefits (NSSF-SHIB)	Private Health Insurance (PHI)	Community-Based Health Insurance (CBHI)
Coverage	6.60%	7.30%	0.12%	1.02%	1%
Beneficiaries	Civil servants (+private)	Informal sector, low income	Formal sector, semi-formal sector	Private market	Informal sector, low income
Enrolment	Mandatory	Voluntary	Voluntary	Voluntary	Voluntary
Collection	Payroll	Remit at facility	Payroll	Remit to PHI	Remit to CBHI
Premium	6% of salary, shared equally by employer and employee	TZS5,000 to20,000 per year, matched by Government	Part of 20% of salary contributed per month	TZS300,000 to 950,000 per year	TZS30,000 to 40,000 per year
Benefits	Inpatient + outpatient at accredited health facility	Primary health and limited hospital care	Similar to NHIF	Full range	Primary health and limited hospital care
Provider payment	Fee for service	Capitation	Capitation	Fee for service	Capitation
Regulator	Social Security Regulation Authority (SSRA)	SSRA	SSRA	Tanzania Insurance Regulatory Authority (TIRA)	Unregulated

Source: Authors' adaptation using data from Dutta (2015).

Most households access health care services through the NHIF and CHF, which have been designed for different target groups. According to the Tanzanian Health Sector Public Expenditure Review 2014/2015, the NHIF is a self-supporting insurance organization, which showed a decrease in its surplus during the 2012–15 period, although final revenue increases yearly (Table 7). The NHIF supports the country's health and can be considered as a governmental fund.

Table 7: Aggregated budget indicators of the National Health Insurance Fund, selected years

Sources	2012/13	2013/14	2014/15
Contributions income, TZS million	207.502	245.176	286.702
Total revenue, TZS million	266.533	318.065	379.476
Total expenditure, TZS million	132.651	182.185	224.914
Surplus (revenues less expenditures) before tax	133.881	135.880	145.651
Surplus as a share of total revenue, %	50	43	39

Source: Health Sector Public Expenditure Review 2014/2015 (Ministry of Health, Community Development, Gender, Elderly and Children 2016).

The decreasing surplus percentage reflects the improvement of health care facilities: better service and accessibility caused claims to increase. Thus, we can conclude that the statistics are positive from both sides.

As the CHF insurance scheme was designed for poor people, with the aim of providing the necessary health care service, it therefore cannot be self-financing. It is supported mainly by foreign grants and the NHIF (Table 8).

Table 8: Aggregated financial indicators of Community Health Fund in Tanzania, selected years, TZS billion

Year	Brought forward	Received from Ministry of Health, Community Development, Gender, Elderly and Children	Paid to local government authorities	Carried forward
2011/12	2,582.02	1,000.0	1,160.36	2,421.65
2012/13	2,421.65	1,900.0	-	4,321.65
2013/14	4,321.65	1,900.0	0,752.3	5,469.3
2014/15	5,469.3	1,400.0	1,053.98	5,815.31

Source: Health Sector Public Expenditure Review 2014/2015 (Ministry of Health, Community Development, Gender, Elderly and Children 2016).

4.2 Affordability of health care service for low- and middle-income groups

Although there are several medical insurance schemes, the medical system in Tanzania is considered to be pro-rich. Each medical insurance scheme requires the payment of a fee, which is not possible for the majority of people in low-income groups. Table 9 reflects the distribution of health benefits and need among five quintile groups of households in Tanzania. For example, the poorest 20 per cent of households receive only 12 per cent of total health benefits, while their need is 22 per cent of the total health need in the country. The need for other quintile groups is fully covered by benefits (Dutta 2015). Also, despite the improvement in quality and dispensary in recent years, medical conditions are still assessed to be unsatisfactory, especially in rural areas. This is due to a lack of staff, the absence of sanitary conditions, and lack of diagnostic equipment (IHI 2013). Therefore, the health care system in Tanzania is defined as regressive.

Table 9: Benefits and needed health care service among five quintile groups of households in Tanzania

	Quintile 1 Poorest 20%	Quintile 2 2nd poorest	Quintile 3 Middle	Quintile 4 2nd richest	Quintile 5 Richest 20%
Share of benefits, %	11.5	23.5	22	20	22.5
Share of needed health care service, %	22	20	20	18.5	23.5

Source: Authors' adaptation using data from Dutta (2015).

The most beneficial scheme generally is the NHIF medical insurance. The CHF is the cheapest, but it is still not affordable for everyone, and there are almost no free health care services. It is obvious that the health care sector in Tanzania requires additional financial support, and revenue from increases in tobacco and alcohol taxes could be directed to improving the country's health care sector.

4.3 Social assistance in Tanzania

Social assistance is provided with the aim of improving household income and consumption. It is administered by the Tanzania Social Action Fund (TASAF) and includes two community-based cash transfer programmes and one public works programme.

The cash transfer programmes include basic cash transfers and conditional cash transfers. These are provided to poor households that meet a set of eligibility criteria. The common eligibility criteria for households that apply to both programmes are: households with a very low and unpredictable income; households that cannot afford three meals per day; and households with income below the food poverty line of TZS26,085.50 (around US$12) per adult equivalent per

month. Additional criteria for the conditional transfer programmes are: households with school-aged children (aged 7–17 years) that cannot afford to enrol them in school; households with children under 6 years of age that are unable to attend clinic/afford health services for them; and households with pregnant women.

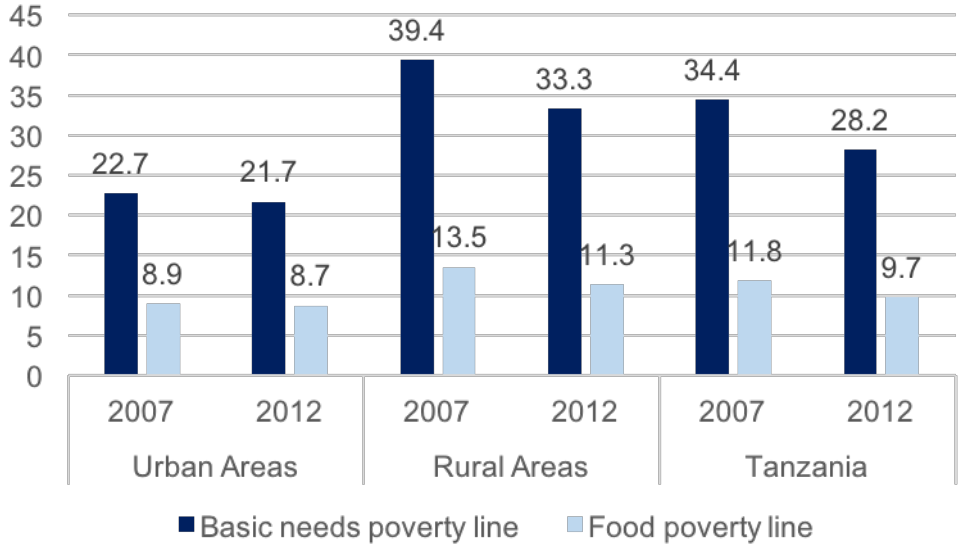
Habibov and Fan (2006), in their study 'Social Assistance and the Challenges of Poverty and Inequality in Azerbaijan', provide evidence that social assistance decreases poverty and inequality. However, developing countries with weak economies face challenges that result in the allocation of finance to these programmes being inadequate. This leads to the transfer of inadequate benefits to the poor, which does not significantly decrease the existing poverty and inequality.

Although Tanzania has also experienced a lack of funding to finance social assistance programmes, the government increased public social protection expenditure from about 2.3 per cent of GDP in 2000 to 7 per cent of GDP in 2014. It is planning to increase the expenditure further to 15.6 per cent in 2020/2021 and is also planning an expansion of the TASAF III/Productive Social Safety Net to cover about 6 million extremely poor people. It will be necessary to measure the effectiveness of these efforts to reduce poverty, as such evidence will be vital for the achievement of their objectives.

5 Poverty and income distribution concerns

Macroeconomic indicators in Tanzania have significantly improved due to the implementation of socio-economic reforms that resulted in an increase in real GDP from 5.1 per cent in 2012 to 7 per cent in 2017 and a reduction in the inflation rate from 16 per cent in 2012 to 5.2 per cent in 2016 (BOT 2018). As an achievement, the poverty level has decreased, although it still remains high (NBS 2014). The overall basic needs poverty level fell by 6.2 per cent from 2007 to 2012; in rural areas it dropped from 39.4 per cent to 33.3 per cent and in urban areas from 22.7 per cent to 21.7 per cent (Figure 4). As is the case for most developing countries, the level of poverty in rural areas is higher than in urban areas. In addition, overall food poverty dropped marginally from 11.8 per cent in 2007 to 9.7 per cent in 2012.

Figure 4: Changes in food poverty and basic needs poverty lines in Tanzania, by area, in per cent



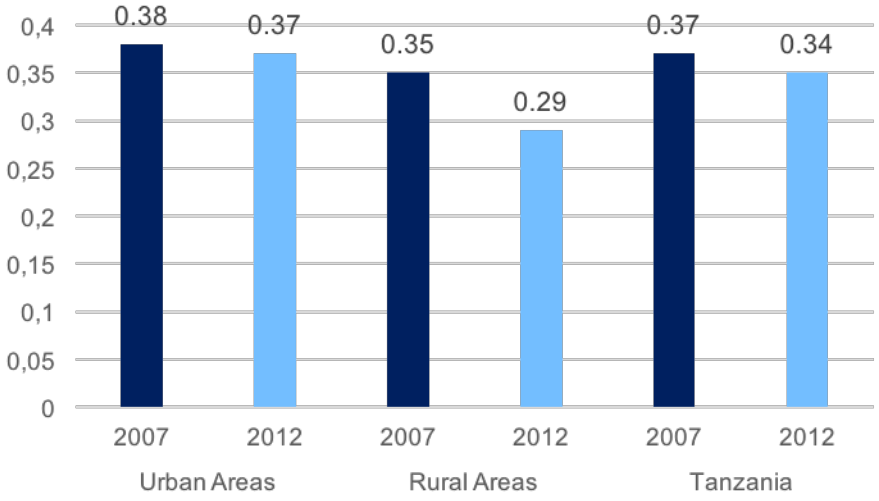
Source: Authors' adaptation using data from from NBS (2014).

Like other African countries, Tanzania has implemented a number of policies to reduce poverty. These include the: Economic Policy and Development, 1960–67; Economic Policy and Development after the Arusha Declaration, 1967–85; Structural Adjustment Programmes and Economic Reforms 1995–2005; Growth and Structural Transformation 2005–15; National Strategy for Growth and Reduction of Poverty I and II, known as MKUKUTA I & II; Millennium Development Goals currently known as the Sustainable Development Goals; and Vision 2025 and the like.

5.1 Income distribution

Rising income inequality is one of the important socio-economic problems in Tanzania. There are several reasons for Tanzania's widening income gap. Firstly, Tanzania's income inequality is significantly higher than most developing countries, although it is lower than some Latin American and African countries. Secondly, income inequality is rising faster in Tanzania than in other countries. As can be seen from Figure 5, the Gini index decreased from 0.37 in 2007 to 0.34 in 2012. Although there is decreasing inequality in all areas in Tanzania, in urban areas the Gini index is higher (0.37) than in rural areas (0.29). This is the result of the income gap between the high-income groups engaged in the private sector and the low-income groups who migrated from the rural areas to seek employment opportunities (Maskaeva et al. 2018).

Figure 5: Changes in the Gini Index in Tanzania, by area



Source: Authors' adaptation using data from NBS (2014).

The last reason for Tanzania's widening income gap is the unfair distribution of income. The Government of Tanzania has recently tried to improve the social security of the country by spending fiscal funds. However, there is still an acute shortage of the funding required to improve people's living standards.

6 Methodology

The study uses the static microsimulation model for Tanzania TAZMOD v.1.8 to simulate the impact of indirect tax benefits on poverty and income distribution. TAZMOD is based on the EUROMOD software, and concepts and variables are implemented in a comparable manner based on the SOUTHMOD modelling conventions for an overview of the state of EUROMOD in European countries.

TAZMOD captures direct and indirect taxes, social security contributions, and benefits as far as the underlying data allow (more details can be found in the country report by Leyaro et al. 2017).

The TAZMOD model uses the 2011/12 Household Budget Survey (HBS 6th round) of the Tanzanian mainland (NBS 2014) based on probabilistic sampling. TAZMOD is based on 46,593 individuals living in 10,186 households.

Household consumption spending data is used to compute the indicators of poverty and income distribution over income, which is under-reported in the Household Budget Survey and may therefore affect the interpretations. Also, in the Tanzanian economy, where most households consume their own produce, consumption is regarded as a better measure of poverty than income (Habibov and Fan 2006). This scale makes this study consistent with similar poverty- and income distribution-related studies conducted in Tanzania.

In order to illustrate the types of results and analysis that can be provided, two hypothetical policy reforms are considered:

Reform 1: The excise duty on alcoholic beverages (beer, spirits, and wine), cigarettes, and tobacco products is increased by 10 per cent. The Tanzanian government increases excise duty for these commodities by 5 per cent each year with several aims, including the aim to reduce consumption as it adversely affects people's health. Moreover, these commodities are considered as luxuries and thus any increase in their price (due to an increase in the tax rate) is likely to have a greater effect on the rich than the poor and thus reduce income inequality. Also, the standard VAT rate on the same commodities is increased from 18 per cent to 19 per cent. Then the contributions from employers to the NHIF are increased from 3 per cent to 4 per cent of employees' monthly salary. This implies that part of the increased revenue is used to subsidize the health sector, and thus the burden of contribution is reduced for formal employees. This is expected to increase their disposable income and consumption and thus reduce poverty levels.

Reform 2: The excise duty on alcoholic beverages (beer, spirits, and wine), cigarettes, and tobacco products is increased by 10 per cent. The VAT rate on these commodities is increased from 18 per cent to 19 per cent. Then the social security contribution paid by employees is reduced from 3 per cent to 2 per cent and the contribution paid by employers is increased from 3 per cent to 5 per cent. This implies that part of the increased revenue is used to subsidize the health sector, and thus the burden of contribution is reduced for formal employees. This is expected to increase their disposable income and consumption and thus reduce poverty levels.

The reforms were chosen to show the effects that different types of policy changes have on revenue and expenditure, income distribution, and poverty. The baseline system in the analyses uses 2017 tax-benefit calculation rules, and uprating factors are applied to update income components to the 2017 policy year. Two new systems were created for the reforms: 2017_1 and 2017_2.

7 Microsimulation results

Microsimulation analysis focuses on the quantitative assessment of the impacts on household income of some indirect tax and social security contribution reforms. To understand and trace the channels through which specific indirect taxes, such as excise duty and the VAT rate on alcohol and tobacco products, and contributions paid by employees and employers to the NHIF

have an impact on households' income and poverty, the analysis is divided into three sections: budgetary effect, household income inequality effect, and poverty effect.

7.1 Budgetary effect

The analysis focuses on the results from both reforms after they capture the effects of changes in the contribution to the NHIF and in the rise of excise duties and the VAT rate on alcoholic beverages and tobacco products that could be used to finance the variation in employer or employee contributions to the social fund.

The results of both reforms show benefits for government revenue. The total government revenue increases by 0.013 per cent in Reform 1 and by 0.016 per cent in Reform 2. The increase in excise duties and the VAT rate on alcoholic beverages (beer, spirits, and wine), cigarettes, and tobacco products increases indirect taxes in both reforms. Social security contributions change by the same portion in both reforms and rise by 0.17 per cent (Table 10).

Table 10: Aggregated indicators of government revenue and expenditure, TZS billion

Indicator	Baseline year, 2017	Reform 1	% baseline	Reform 2	% baseline
Government revenue through taxes, social security contribution, and indirect taxes	8,358.8	8,465.9	0.013	8,491.7	0.02
Direct taxes	4,463.2	4,463.2	-	4,489.1	0.01
Indirect taxes	3,272.4	3,275.7	0.001	3,275.6	0
Social security contributions (employee and employer)	623.1	726.9	0.17	726.9	0.17
Government expenditure on social transfers	194.2	194.2		194.2	
Child benefits	0	0		0	
Social assistance	0.194	0.194		0.194	
Orphan/widow benefits					
Disabled benefits					
Unemployment benefits					
Pension benefits					

Source: Authors' calculations.

7.2 Household income inequality effect

The analysis of microsimulation scenarios shows that only Reform 2 has a positive effect on household income distribution based on disposable income and consumption. Reform 1 has no impact on income distribution. This underlines the fact that raising indirect taxes while simultaneously increasing employers' contributions to the NHIF cannot reduce inequality.

The reduction of employees' contributions to the NHIF increased the disposable income of households in higher-income groups (Quintile 4 and Quintile 5) in Reform 2 (Table 11). It should be noted, that these groups of households receive most of their income from wages and, therefore, Reform 2 has a significant impact on the income of these household groups.

Table 11: Household income distribution, TZS billion

	Base year, 2017	Reform 1_2017	Difference base vs Reform1	Reform 2_2017	Difference base vs Reform2
Quintile 1	0	0	0	0	0
Quintile 2	0.054	0.054	0	0.054	0
Quintile 3	118.3	118.3	0	118.35	0.05
Quintile 4	234.78	234.78	0	236.36	2.130
Quintile 5	795.15	795.15	0	796.19	0.479

Note: Quintile 1 – poor households with lowest income, Quintile 2 – poor households with low income, Quintile 3 – households with medium income, Quintile 4 – households with high income, Quintile 5 – households with highest income

Source: Authors' calculations.

It is important to note that the amount of indirect taxes (in our case VAT and excise duties on alcoholic beverage and tobacco products) each household pays is determined by their consumption expenditure rather than their disposable income. The richest fifth of households pay several times as much in indirect taxes as the poorest fifth. This represents higher consumer expenditure on commodities subject to these taxes by higher-income households.

Although the wealthiest households pay more in indirect taxes than the poorest, they pay less as a proportion of their income. The indirect taxes lead to an increase in the inequity gap in society.

After indirect taxes, the wealthiest households have post-tax disposable incomes that are 2.63 times those of the poorest households (TZS 1,221.79 billion compared with TZS 465.51 billion per year, respectively). This ratio is increased slightly in Reform 2. Equity demands that poorer households should not be disproportionately burdened with indirect taxes as compared to richer households.

The way in which consumption-based household income is affected by Reform 2 is shown more clearly in Table 12. All beneficiaries (household groups) in the baseline year are affected by the reform, although in different ways. All household groups face an increase in consumption-based disposable income.

Households in the first and third quintiles receive a slightly higher benefit than in the baseline year. The remaining three groups of households are affected more; for example, the income of Quintile 2 (poor households with low income) increased by TZS0.353 billion, the income of Quintile 4 increased by TZS2.13 billion, and by TZS0.479 billion for Quintile 5. Thus, the Reform 2 results show that there is a positive impact on the consumption-based income distribution for poor households.

Table 12: Consumption-based income distribution (after tax and transfers in TZS billion), by household group

	Base year, 2017	Reform 1_2017	Difference base vs Reform1	Reform 2_2017	Difference base vs Reform2
Quintile 1	465.51	465.51	0	465.54	0.035
Quintile 2	633.08	633.08	0	633.43	0.353
Quintile 3	730.77	730.77	0	730.82	0.055
Quintile 4	845.42	845.42	0	847.55	2.130
Quintile 5	1221.79	1221.79	0	1222.27	0.479

Source: Authors' calculations.

Table 13 compares the Gini coefficient and P80/P20 ratio of equalized disposable income in both reform scenarios. Only Reform 2 is redistributive. Considering the Gini coefficients of equalized disposable income in Reform 2 shows the degree to which the indirect tax-benefit system increases inequality. The Reform 2 increases inequality by 0.001 points. Overall, as household income inequality increases, the P80/P20 ratio also rises by 0.01 points, and therefore slightly increases income inequality in society.

Table 13: Gini coefficient and P80/P20 ratio (after taxes and transfers)

	Base year 2017	Reform 1_2017	Difference base vs Reform 1	Reform 2_2017	Difference base vs Reform 2
Gini (household income)	0.39	0.39	0	0.4	+0.001
P80/P20	2.62	2.62	0	2.63	+0.01

Source: Authors' calculations.

7.3 Poverty effect

Poverty alleviation and the reduction of income inequality are often the main motivations for the introduction of tax-benefit reforms (Jouste and Rattenhuber 2018). This supports the results of both reforms. Table 14 shows the results from both reforms using the 2017 rules as a benchmark. According to the income-based poverty indicators, when calculated using the indirect tax and social contribution rules for 2017, the share of the poor population is 73.85 per cent. The results of Reform 2 show that a progressive indirect tax policy and changes in employee social contributions would decrease the share of poor households by 0.04 per cent.

Table 14: Income-based poverty indicators (after taxes and transfers)

	Base year 2017	Reform 1_2017	Difference base vs Reform 1	Reform 2_2017	Difference base vs Reform 2
Share of poor population, %					
All	73.85	73.85	0	73.82	-0.04
Poor households out of:					
male-headed households	73.92	73.92	0	73.88	-0.03
female-headed households	73.58	73.58	0	73.54	-0.04
households with children	75.3	75.3	0	75.26	-0.04
households with older persons	78.2	78.2	0	78.2	0
Poverty gap, %					
All	59.29	59.3	0.01	59.28	-0.01
Poor households out of:					
male-headed households	59.6	59.61	0.01	59.59	-0.01
female-headed households	58.04	58.04	0	58.03	-0.01
households with children	60.41	60.41	0.01	60.4	-0.01
households with older persons	62.13	62.13	0	62.12	0

Source: Authors' calculations.

Table 14 classifies households by type and defines them by the gender of the household head. For example, the poverty gap rises by 0.01 per cent in Reform 1. This led to an increasing poverty gap rate among households headed by males and households with children. However, the results of Reform 2 have a more positive effect on the poverty gap. Overall, the poverty gap reduces by 0.01 per cent. The poverty gap also reduces by 0.01 per cent for all households except those with older persons.

The effects of the simulated reforms on poverty are presented in Table 14. Based on simulated policy reforms, we calculated two consumption-based poverty indicators: the proportion of poor and the poverty gap.

The results in Table 15 indicate that the impacts of policy reforms on poverty are reduced by the changes in indirect taxation introduced to finance the employee contribution to the social fund (Reform 1). It can be concluded that rises in indirect taxes generate negative impacts in the commodity markets that affect poor households. Despite the reduction in the employee contribution to the NHIF, two types of households (male-headed households and households with older persons) experienced adverse effects that were caused by the rises in indirect taxes.

Table 15: Consumption-based poverty indicators (after taxes and transfers)

	Base year 2017	Reform 1_2017	Difference base vs Reform 1	Reform 2_2017	Difference base vs Reform 2
Share of poor population, %:					
All	28.83	28.86	0.03	28.83	0
Poor households out of:					
male-headed households	29.23	29.27	0.03	29.24	0
female-headed households	27.2	27.2	0	27.19	-0.01
households with children	30.15	30.15	0	30.12	-0.03
households with older persons	37.42	37.56	0.14	37.56	0.14
Poverty gap, %					
All	6.21	6.21	0	6.2	-0.01
Poor households out of:					
male-headed households	6.34	6.34	0	6.33	-0.01
female-headed households	5.68	5.68	0	5.67	-0.01
households with children	6.52	6.52	0	6.51	-0.01
households with older persons	8.05	8.05	0	8.05	0

Source: Authors' calculations.

8 Conclusion

This paper analysed the effects of increasing indirect taxes (excise duties and VAT on alcoholic beverage and tobacco products) and changing the social security contributions paid by employees and employers on income distribution and poverty alleviation in Tanzania. The static microsimulation approach used the TAZMOD v1.8 tax-benefit model for Tanzania, which is based on data of 2011/12 Household Budget Survey of Tanzania.

The two simulation reforms analysed in this study have different impacts on income distribution and poverty reduction in Tanzania.

In the first simulation reform, excise duties on alcoholic beverages (beer, spirits, and wine) and tobacco products were increased by 10 per cent. The VAT rate on these commodities was also increased from 18 per cent to 19 per cent. Then the contributions paid by employers to the NHIF were increased from 3 per cent to 4 per cent. The results showed a positive impact on aggregated government budget indicators (e.g. government total revenue, indirect tax revenue, social security contribution) only. The poverty gap rose by 0.01 per cent. This led to an increase in the poverty gap rate between households headed by males and households with children. The findings support the claim that raising indirect taxes on luxury goods and increasing only the employers' contribution to the social security fund is quite ineffective in reducing income inequality in society.

In the second reform, the social security contribution paid by employees was reduced from 3 per cent to 2 per cent, and the contribution paid by employers was increased from 3 per cent to 5 per cent. Furthermore, excise duties and the VAT rate on luxury goods (alcoholic beverages, tobacco products) were increased in the same way as in Reform 1.

The results of Reform 2 showed a positive effect on household income distribution and consumption. Revenue from increased indirect taxes was used to subsidize the health sector. The findings indicated that despite an increase in unequal income distribution, poverty indicators fell. The reduction of the employees' contribution to the NHIF increased the disposable income of households in the higher and highest income groups. All household groups had an increase in consumption-based disposable income. The poor households (Quintile 1 and Quintile 2) received greater benefit than in the baseline year. The progressive indirect tax policy and changes in the social contributions of employees decreased the share of poor households. Overall, the poverty gap reduced by 0.01 per cent. The poverty gap also reduced by 0.01 per cent for all households except for households with older persons.

Thus, changes in indirect tax policy without reallocation to the social sectors do not directly impact households' income distribution. However, this policy impacts on household consumption and, consequently, it can reduce the poverty gap and improve the state of economic well-being in the country.

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