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Tobacco Control in Uganda:
An analysis of the impact of taxation on consumption patterns

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AN ANALYSIS OF THE IMPACT OF TAXATION ON CONSUMPTION PATTERNS

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ABSTRACT

This study analyses the trends in tobacco consumption in relation to potential tobacco tax policy changes in Uganda. Specifically, we examine the tobacco consumption patterns and simulate the likely impact on consumption of changes in tobacco taxation in the short run (3 years) and the long run (10 years). We find that tobacco consumption has significantly reduced especially among individuals aged 45-50 years. However, despite the decline, the burden of disease (measured in the short-run) due to tobacco use remains very large. With regard to the simulations, we find that increasing the excise tax by 26 percent from the current levels (UGX 15,000 or US$ 4.2) would result in an 8.7 percent reduction in cigarette consumption (with a -0.6 price elasticity of demand). In the long run (using a -0.6 price elasticity of demand), maintaining the same average tax increment at 14 percent over a 10-year period would yield a 33 percent reduction in per capita consumption and an 18 percent reduction in smoking intensity. As such to combat the negative effects of tobacco consumption in Uganda, the country needs to work towards meeting the WHO recommended proportion of tax on tobacco retail prices and changes in tax rates need not only to be made regularly and consistently, but must take into account factors contributing to affordability like incomes and inflation.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

BAT (U)	British American Tobacco (Uganda)
BOU	Bank of Uganda
CDC	Centres for Disease Control and Prevention
CTCA	Centre for Tobacco Control Africa
EAC	East African Community
FCTC	Framework Convention on Tobacco Control
FY	Financial Year
GATS	Global Adult Tobacco Survey
GYTS	Global youth tobacco survey
MoFPED	Ministry of Finance Planning and Economic Development
TC	Tobacco Control
TETSiM	Tobacco Excise Tax Simulation Model
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic Health Survey
UGX	Ugandan Shilling
UNHS	Uganda National Household Survey
UNPS	Uganda National Panel Survey
URA	Uganda Revenue Authority
WHO	World Health Organisation

INTRODUCTION

1.1 Background

The World Health Organization (WHO) estimates that tobacco use kills up to 7 million people each year (WHO, 2017). Tobacco is used by over a billion people worldwide and nearly 80 percent of the world's smokers are from low and middle-income countries. Previous research shows that prices are a key determinant of who smokes and tobacco taxation greatly influences cigarette prices (Chaloupka and Warmer, 2000; van Hasselt *et al*., 2015). As such, it is increasingly important for developing countries like Uganda to develop both robust and efficient tax structures for the control of tobacco and tobacco products. Uganda signed and ratified the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) in June 2007; and as a signatory, Uganda has instituted various measures to curb and discourage tobacco use. Accordingly, the Tobacco Control Act (2015) is the primary legislation regulating tobacco products and tobacco use in the country. The act comprises of both tax and non-tax tobacco control measures.[1] Overall, the enforcement and implementation of the act has been quite strong with closures of several shisha[2] establishments in a bid to curb the effects of second hand smoking.[3] However, the direct impact of these measures on reducing tobacco consumption in the country remains unclear.

Despite the strong anti-tobacco stance taken by Ugandan policy makers, the effective use of taxes to control tobacco consumption has only recently taken centre-stage as an instrument of tobacco control. Uganda is still using two tax systems--tobacco taxation in the country is mainly effected through excise and to a limited extent value added taxes (VAT). Over the years, tobacco taxes have undergone several regular increments. Nevertheless, the existing taxes are still below the globally recommended thresholds by the WHO— whereby tobacco excise taxes should make up to 70 percent of the retail price. In Uganda, excise taxes currently make up 31 percent of the retail price for regular cigarettes (MoFPED and URA, 2017).[4] In upholding her obligations as a party to the WHO FCTC, Uganda has started on the path to make better use of excise taxes as an instrument for tobacco control. Indeed, over the past 15 years, the tobacco tax structure has evolved. For instance, in 2004, the country changed from *ad valorem* to a three-tier specific tax on tobacco products. The tiered tax system was then simplified to only two tiers in June 2015. In addition to this, there are proposals to institute a uniform excise tax for all cigarettes (MoFPED and URA, 2017). The current tax structure – a tiered system- easily lends itself to manipulation and is generally recognized as a less effective tax structure model for tobacco control (Shang et al., 2014). Thus, the taxes levied on tobacco products may not be making the impact they can and should be making, and the state may be incurring both direct and indirect revenue losses by operating under the current tax structure.

1.2 Justification for the study

Tobacco use is globally recognized as a major risk factor for non-communicable diseases like heart diseases as well as lung and related cancers (Ezzati and Lopez, 2003; Islam *et.al*, 2014). Although increases in tobacco excise taxes have been shown to be the most effective policy instrument for reducing smoking in other developing countries (e.g. Van Kinh *et.al*., 2006, Shang *et.al*., 2014 and IARC, 2011); there is little evidence investigating the impact of tax rate and tax structure changes on tobacco consumption in Uganda (the only exception is the 2017 study by MoFPED and URA). Taxation as a tool for tobacco control is underpinned by two competing objectives for governments. The first is to optimise revenue by imposing higher taxes and the second is to use the higher prices borne out of those higher taxes as a deterrent to suppress consumption and reduce the resultant negative externalities. As

1 Since the Act was passed in May 2016 there has been heavy enforcement of anti-smoking rules in public places, comprehensive bans on all tobacco advertising promotion and sponsorship as well as stricter regulations on the labelling and packaging of tobacco products. These measures and restrictions have been the core of tobacco control in Uganda and have played some role in diminishing some of the appeal and allure of smoking.

2 Shisha is a molasses-based tobacco concoction smoked in a hookah.

3 While effective monitoring of tobacco use has remained a challenge for low and middle-income countries, Uganda has been identified as the only low-income country with an effective monitoring system; the country's multi-partner approach and the strong use of non-tax measures has placed Uganda as one of the leaders of tobacco control in Africa (WHO, 2017).

4 On the other hand, the current share of total tobacco taxes (excise and VAT) in the cigarette retail price is 42%.

such, one of the driving questions of tobacco control is finding an economically efficient method of reducing tobacco consumption. While a study by MoFPED and URA (2017) looked at the revenue implications of instituting both a higher and uniform excise tobacco tax, to the best of our knowledge, there is no analysis that looks at the consumption aspects of tobacco taxation in Uganda. This study contributes to tobacco control policy in Uganda by generating evidence on the probable response of consumption to changes in taxation.

Specifically, we estimate the potential gains from reduced tobacco consumption that would be realised from a further simplified taxation structure. Current proposals to reform the tax structure aim to increase the share of excise tax in cigarette retail price from 31 to 52 percent and reduce consumption by 10 percent over the next three years (MoFPED and URA, 2017). Taking this into consideration, this study aims to better understand the impact of such proposed and other potential tobacco taxation policies on tobacco consumption in Uganda. Based on past consumption and prevalence trends, we identify the implications of the proposed tax changes beyond revenue for the next 10-years (where data permits). We therefore generate evidence that would help to build a stronger foundation from which to inform the design of current tobacco taxation and future taxation reforms.

1.2.1 Objectives

Taking the above into consideration this study is driven by two key objectives which are to:

I. Assess and analyse the implications of past tobacco tax reform on tobacco consumption
II. Simulate the effects of potential tobacco tax reform on tobacco consumption

The remainder of the report is set out as follows; the next section reviews the relevant literature covering the rationale of taxation as a tobacco control tool and the evolution of tobacco taxation in Uganda. Second is a discussion of the analytical framework and methodology applied in the research. Third is a trends analysis that investigates overall consumption patterns vis-à-vis tax rate and structure changes; the penultimate section carries out an estimation of the impact of potential tax changes on future consumption and the conclusion synthesises the preceding analysis by highlighting the consumption issues that need to be taken into consideration when formulating appropriate tobacco taxation reforms.

2. BACKGROUND TO TOBACCO TAXATION

2.1 Taxation as a tool for tobacco control

Estimates by the World Bank show that a tax increase which raises tobacco prices by 10 percent can decrease tobacco consumption by as much as 8 percent in low and middle-income countries (Chaloupka *et.al*, 2011). Higher tobacco product prices which can be achieved through heavy taxation can encourage tobacco users to quit, prevent the youth from initiation to smoking and reduce consumption among those who continue to use tobacco. In addition, the revenues generated through tobacco taxes can help to offset the national healthcare costs of tobacco-related illnesses as well as provide funding for more comprehensive tobacco control programs. Beyond increasing revenues for governments, higher taxes and more effective tax structures that lead to higher cigarette prices are expected to:

- Reduce the number of adults who become addicted to tobacco;
- Reduce the youth smoking rates;
- Increase the number of price-sensitive consumers (both adults and youth) who quit;
- Reduce the risk of tobacco-related illnesses and deaths;
- Increase governments long-term savings from spending less on tobacco-related illnesses.

It is precisely the extent and magnitude of this deterrent effect that this study investigates.

As earlier mentioned, increasing the price of tobacco products through taxation is one of the many tools used by countries all over the world to reduce consumption. Governments typically apply a range of taxes on tobacco products which include VAT, import and stamp duties and sales taxes etc. However, taxes that are specifically levied on tobacco products directly influence the price of tobacco products and

therefore have the biggest effect on revenue, tobacco consumption and overall use. However, not all tax initiatives are equally successful in attaining the desired reduction in consumption (Golden *et al*., 2016), thereby making the structure of the tax even more important. Overall, tobacco excise taxes can take two main forms; ad valorem or specific.

Ad Valorem Vs Specific taxes

Ad valorem taxes are typically levied as a percentage of the value of tobacco products while specific taxes are levied based on the quantity of tobacco products. Some countries may use purely specific taxes, purely ad valorem or a hybrid of both. Specific excise taxes are usually easier to implement and administer and provide a much more predictable revenue stream because of the limited dependence on manufacturers' pricing. Accordingly, research has shown that ad valorem taxes tend to lead to lower prices thereby compromising tobacco control efforts (WHO 2010).[5]

Uniform Vs Tiered specific taxes

Specific excise taxes can either be levied as uniform or tiered taxes. On the one hand, tiered tax structures, rates levied on cigarettes differ with the characteristics of the cigarette, i.e. packaging type, length, or presence/absence of a filter, brand etc. A uniform tax structure on the other hand applies the same rate to ALL tobacco products regardless of characteristics. Ideally, efficient tobacco control through taxation should promote tobacco tax equity to ensure that all other tobacco products are taxed at rates which are similar to those imposed on cigarettes to discourage substitution.

One of the main criticisms of tiered tax structures is that they may incentivize manufactures to alter product characteristics to avoid the higher tax tiers (WHO 2010).[6] In so doing, tiered tax structures allow for price gaps between brands and types of tobacco products and cigarettes. Price gaps undermine and reduce the effectiveness of taxation because they increase the opportunities for substitution to cheaper options as taxes rise. This is particularly problematic for the consumption reduction goal of tobacco taxation.

5 WHO. WHO technical manual on tobacco tax administration. WHO; 2010.
6 WHO. WHO technical manual on tobacco tax administration. WHO; 2010.

Tiered tax structures and implications for differential pricing

Tobacco users respond to opportunities to purchase lower priced products (Dhar and Hoch, 1996) and producers are in the same vain likely to oblige them by producing more products in the lower taxed tiers with lower retail prices. Having a tiered tax system allows the tobacco industry to disproportionately shift taxes to higher priced brand variants to maintain options for price sensitive customers (Gilmore *et al*., 2013). This results in price dispersion both within and between price tiers in the cigarette market (Golden *et al*., 2016). Increases in tobacco prices are therefore often accompanied by an increase in incentives for price discrimination as the industry tries to prevent and minimise the loss of the price sensitive customers. Typically, these price sensitive consumers are the youth and people with lower incomes who are often the demographic groups most at risk for tobacco use and initiation (Chaloupka and Pacula 2001; Azagba and Sharaf 2011). As such, they are one of the main targets of tobacco tax legislation because policies that shrink tier-specific price dispersion may have a particularly strong impact on youth and other vulnerable groups. A good tobacco tax regime should target to reduce consumption and initiation to tobacco use by limiting and reducing the incidence of price dispersion. Ultimately the effectiveness of tax changes in reducing tobacco (especially cigarettes) consumption is dependent on the extent to which cigarette manufacturers' pass on the excise tax to consumers. This is in turn dependent on the price elasticity of supply for tobacco products. Research shows that producers will generally pass on the entire increase in excise tax onto the consumers (Hanson and Sullivan 2009; DeCicca *et.al*., 2013). If increases in the excise tax are passed on to the consumers fully, then this would have good consequences for tobacco control.

2.2 The Ugandan tobacco market

Cigarettes are the most consumed tobacco product in the Ugandan market accounting for 90 percent of all tobacco products. The cigarette market is dominated by the cheaper soft cap brands with a market share of 90 percent while the remaining 10 percent is taken up by the hinge lid brands (MoFPED and URA, 2017). In addition, the soft cap brands (whose consumers are

believed to be more price sensitive) are much cheaper than the hinge lid brands. In 2016, the average nominal price of a hinge lid pack was UGX 6,500 (US$ 1.9) compared to UGX 2,587 (US$ 0.76) for a Soft Cap brand (MoFPED and URA, 2017).

Even though Uganda is a tobacco producing country, over 90 percent of the tobacco leaf produced is exported (MoFPED and URA, 2017). In return, the majority of cigarettes consumed are imported primarily from within the East African Community (EAC) (Kenya). As such, the Ugandan tobacco market is affected by the illicit trade of tobacco. As a key re-exporter of several goods in the EAC region, the Ugandan market is particularly susceptible to illicit cigarette trade. British American Tobacco (BAT)-Uganda—the leading cigarette manufacturer/importer—has regularly argued against most tobacco control measures claiming that they will and have increased illicit trade. While the Uganda Revenue Authority (URA)—the body responsible for implementation of tax policies—repeatedly reports seizures of illegal cigarettes, this alone cannot reveal the full extent of the illicit market.[7] Using a gap discrepancy method identified by Merriman (2002) we compared survey based consumption estimates and the taxed quantities of cigarettes to estimate the size of the illicit market in 2013.[8] Using prevalence figures from GATS, the gap between domestic consumption and the number of cigarettes taxed by URA reveals that the illicit market makes up 30 percent of cigarettes consumed. Without regular consumption data it is unclear and difficult to illustrate how or if this has changed in relation to changes in tax. However, the 2016 BAT annual report estimates that Uganda lost UGX 29 billion (about US$ 8.5 million) in 2016 due to illicit tobacco trade (BAT, 2017). The above illicit trade loss was equivalent to 34 percent of total taxes paid by BAT; however, this figure should be interpreted in the context of overestimates of the illicit market by the tobacco industry.[9]

The focus on the consumption side of tobacco taxation is drawn out of the fact that governments incur avoidable expenditures through increased public health costs and a loss in productivity because of tobacco-related illnesses and deaths. A 2017 study by the Centre for Tobacco Control Africa (CTCA, 2017) examined the economic cost of tobacco use in Uganda.[10] Results from the study found that current or former smokers, spent an average of UGX 3,697,255 (about US$ 1,010[11]) annually covering medical costs and this amount is more than double the UGX 1,619,309 (about US$ 442) amount spent by those who had never smoked before (CTCA, 2017). Furthermore, this is 55.5 percent of the 2016 per capita income of US$ 1,823.[12] Using the relative risk (RR) ratio and tobacco use prevalence, the study estimated that about 1 percent of the total cost of tobacco-related illnesses in Uganda can be attributed to tobacco use. The study further estimated the annual total health cost of tobacco use in Uganda (including both direct and indirect costs) at UGX 328.82 billion (about US$ 89 million) which currently outweighs the reported or assumed benefits in the form of revenue and income generation from the tobacco industry.[13] As such, the study concluded by recommending revisions in the tax structure that reduce the affordability of tobacco products especially among the youth and the poor.

Expenditure on cigarettes

Evidence from the CTCA (2017) study found that on average a pack (20 sticks) of cigarettes cost users about UGX 400 (US$0.15). From this, the average annual cost of cigarettes for users came up to UGX 949,000 (US$ 365). This amounts to over half of the 2016 per capita GNI which stood at US$630 (World Bank, 2016). Results from the Global Adult Tobacco Survey Uganda (2013) showed that tobacco products are low priced in comparison to other basic household items. One of the key recommendations emerging from the study was the call for prices of tobacco products

7 URA reportedly seized up to 13 million cigarettes valued at UGX 616 million ($203,337) in 2009/10 and the same amount was seized in 2013/14 (Daily Monitor 05/06/2015).

8 The only year in which both sets of data were available in order to make the calculation.

9 During 2014 and 2016, the amount of tax collected by BAT reduced from UGX 116 billion in 2014 to UGX 100 billion in 2015 and before reducing further to UGX 85 billion by 2016. A non-conducive macro-economic environment and growth in illicit trade are highlighted as the reasons for the continuous drop in cigarette sale volumes (BAT, 2017).

10 The CTCA Uganda study was based on the "Cost of Illness Approach" as outlined in the World Health Organization's (WHO) Economics of Tobacco Toolkit: Assessment of Economic Costs of Smoking.

11 Calculated using the Bank of Uganda exchange rate of 1US$=UGX 3658 on 25/10/2017

12 Based on the World Bank (2017a), Uganda's gross domestic product (GDP) per capita in Purchasing Power Parity (PPP) dollars was 1,823 in 2016.

13 In 2016, British American Tobacco (BAT)—the leading cigarette company in Uganda contributed UGX 75 billion (about US$ 21 million) in tax revenues to Uganda (BAT, 2017).

to be increased through taxation, thereby making them less affordable and dissuading initiation among potential users especially the youth (GATS, 2013).

Although the percentage of tobacco use has reduced over the past 5 years from 10.5 percent in 2012/13 to 5.4 percent in 2016/17 (UNHS), smoking prevalence among the youth has remained higher than the national rate. The Uganda Global Youth Tobacco Survey Report (2008) found that up to 15.6 percent of the students had ever smoked cigarettes while the national rate from the 2009/10 UNHS was 8.5 percent. This is a worrying trend because reducing the numbers of new smokers is one of the key tenements of tobacco control.

2.3 Evolution of tobacco taxation in Uganda

Until July 2004, Uganda applied an *Ad Valorem* tax to tobacco products which was changed to a more complex multi-tiered structure that imposed different rates based on the brand and characteristics of cigarettes and tobacco products. The tiered structure comprised of three tiers for cigarettes based on packaging characteristics and origin while other tobacco products remained under an *Ad Valorem* tax. Similar to taxation structures in most countries 'other' tobacco products are taxed at different rates than cigarettes and have thus retained the *Ad Valorem* tax. Table 1 details the tobacco taxation structure in Uganda during 2004/5-2017/18. This three-tiered structure was reduced to two tiers in FY 2015/16 with other tobacco products maintaining the *Ad Valorem* tax. Overall, the tax changes in Table 1 have been driven by need to raise additional tax revenues rather than health concerns. In addition to this simplification there are proposals to further adjust the tax structure. Specifically, the MoFPED and URA (2017) proposed a uniform tax on all cigarette types in the next three financial years followed by increments in the new harmonised specific tax for proceeding financial years.

Furthermore, previous excise tax ammendment proposals have argued that imported cigarettes shoud be taxed at a diferent rate from that levied from domestically produced ones. The reasoning behind this is that lower taxes on domestically produced tobacco products would "promote growth and encourage more companies to invest in the country".[14] This proposed structure presents a challenge because the separation of foreign and domestically produced cigatrettes in tax schemes essentially creates an additional tier[15]. From a public health perspective, both types of tobacco products are equally harmful. In addtion to the excise and VAT taxes, ciagrettes in Uganda also incur an import duty that is 25 percent of CIF value if they are coming from outside the EAC. Other tax ammendment bills however have also recognised that the two-tiered system leaves a window that may encourage substituion and illcit trade.

14 Report of the committee on finance planning and economic development on the excise duty amendment bill, 2017.

15 This has already raised complications as it contravenes EAC laws and British American Tobacco has subsequently taken Uganda to court over this matter. In January 2018, the East African Court of Justice issued an injunction stopping URA from collecting Tax from BAT pending hearing and determination of the case.

Table 1: Evolution of Uganda's tobacco excise tax

Excise Tax (UGX Per 1000 sticks)														
Tobacco Product	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**11/12**	**12/13**	**13/14**	**14/15**	**15/16**	**16/17**	**17/18[1]**
Soft Cap 1	19,000	19,000	19,000	20,000	20,000	20,000	20,000	22,000	22,000	32,000	35,000	45,000	50,000	55,000 ***60,000****
% change from previous rate	-	0%	0%	5.3%	0%	0%	0%	10%	0%	45.5%	9.4%	28.6%	11.1%	10%
Soft Cap 2	25,000	25,000	25,000	25,000	22,000	22,000	22,000	25,000	25,000	35,000	35,000	Tier removed	Tier removed	Tier removed
% change from previous rate	-	0%	0%	0%	-12%	0%	0%	13.6%	0%	40%	0%	Tier removed	Tier removed	Tier removed
Hinge Lid	48,000	48,000	48,000	50,000	50,000	50,000	50,000	55,000	55,000	69,000	69,000	75,000	80,000	80,000 ***85,000****
% change from previous rate	-	0%	0%	4.2%	0%	0%	0%	10%	0%	25.5%	0%	8.7%	6.7%	0%
Cigars, cheroots and cigarillos containing tobacco	150%	150%	150%	150%	150%	150%	160%	160%	160%	160%	160%	160%	200%	200%
Smoking tobacco whether or not containing tobacco substitutes in any proportion	150%	150%	150%	150%	150%	150%	160%	160%	160%	160%	160%	160%	200%	200%
Homogenised or reconstituted tobacco	150%	150%	150%	150%	150%	150%	160%	160%	160%	160%	160%	160%	200%	200%
Other	150%	150%	150%	150%	150%	150%	160%	160%	160%	160%	160%	160%	200%	200%
% change from previous rate (for all 'other' tobacco products)	-	0%	0%	0%	0%	0%	6.7%	0%	0%	0%	0%	0%	25%	0%

Source: Authors compilation from Excise Tax Amendment Bills 2004-17; * Rate for imported cigarettes:

3. ANALYTICAL FRAMEWORK AND METHODOLOGY

3.1 Data

The data used to analyse trends in the household consumption patterns of tobacco and cigarettes is drawn from: the 2009/10, 2013/14, 2016/17 waves of the Uganda National Household Surveys (UNHS); the 2011 Uganda Demographic and Health Survey (UDHS); and the 2013 Global Adult Tobacco Survey (GATS) and Global Youth Tobacco Survey (GYTS) datasets. At the macro level consumption data is drawn from URA, using information on the number of cigarettes taxed from importation and from domestic production.

These surveys have information-rich cross-sectional data with questions at the household, adult and youth levels. All the UDHS, UNHS and GATS surveys are nationally representative hence minimize any challenges that may arise from blending data. Questions cover a range of matters including income, wealth status, health and education etc. The UNHS in particular has detailed information on household demographics which is ideal for analysing the characteristics of tobacco users and making analysis of the levels of initiation and quitting. Although Uganda carries out a national panel survey (Uganda National Panel Survey-UNPS) it does not have a substance abuse section which would be useful in following smokers over a given period of time.

Addressing the two objectives: The first objective is addressed by conducting a consumption trend analysis of the different tobacco products from 1950 to 2000.[16] The trend analysis looks at consumption from the household level by comparing current tobacco users with those who have ever used tobacco (this includes persons that have used tobacco in the past but have since stopped).

This second objective is addressed by using the TETSiM[17] from the Economics of Tobacco Control Project to assess the impact of a series of potential tax changes on consumption in Uganda. Simulations are done to take into account both the long-term and short-term probable outcomes. Scenarios are based on a number of considerations in order to strengthen both the analysis and assess the sensitivity and significance of some of the variables within the model. Analysis will be done by applying the simulation to the main tier types of cigarettes (Soft Cap).

Definition of prevalence: The UNHS survey of 2009/10, 2012/13, and 2016/17 gathered information from respondents aged 10 years and over regarding any current or previous use of tobacco products which included cigarettes, cigars, shisha, and pipe-smoked tobacco. This information is used to estimate the prevalence of smoking by age.

Data limitations: There are some data gaps throughout the review period that require estimations and projections of certain figures. As a result, some trend analyses are incomplete, or data is sourced from multiple sources in an effort to compensate for the gaps thereby making some of the analysis largely inferential. Some of these limitations include lack of revenue and sales data before 2009 which was when the URA switched to a unified digitised system. In addition, earlier rounds of the UNHS did not collect information on tobacco use, hence the use of UDHS data in the missing years. The substance abuse section of the UNHS was added in 2009/10 and has evolved to ask more specific questions on tobacco use patterns. Gaps in consumption data from the UNHS are supplemented with data from the GATS, GYTS and the UDHS where possible.

3.2 Assumptions of the simulation exercise:

- The model only considers one tier of the specific excise tax and does not fully accommodate the more complex Ugandan tax structure. However, given the dominance of Soft Cap cigarettes in the tobacco market, results should be considered as largely representative of the market. Even

16 In answering this objective, the measures of tobacco and cigarette consumption patterns are based on the responses to a series of questions (See Appendix 1) relating to tobacco use in the UNHS, UDHS, GATS and GYTS datasets.

17 A comprehensive appendix of the mathematical derivation of the model is available here.

though the market is two tiered the 90 percent market coverage of the Soft Cap cigarettes allow for the assumption that the market is largely homogeneous. While there is a sizeable difference in the average price. Consumers of the higher priced hinge-lid brands are considered to be less sensitive to price (MoFPED and URA, 2017) and are thus less likely to trade down to cheaper options when faced with price increases.

- The price elasticity of demand for cigarettes has been calculated by several studies (Wasserman *et al*., 1991; Gallet and List 2003; Jha and Chaloupka 1999). In the absence of accurate price/demand elasticity estimates the figure typically applied to developing countries is between the range of -0.4 and -0.8 (World Bank, 1999). As a result of the segmentation of the cigarettes market in Uganda, earlier studies (MoFPED and URA, 2017) have adopted price elasticity of demand at -0.2 and -0.6 for hinge lid and soft cap cigarettes respectively. This is done to reflect that consumers of more expensive brands are less price sensitive. In the simulation exercise, elasticity is assumed to be -0.6 (except when the model is testing the impact of different elasticity levels).
- For the long-term simulation, the price elasticity of demand is assumed to be constant
- Supply is assumed to be inelastic- this means that cigarette manufacturers will continue to supply any quantity demanded by their consumers.
- Increases in the excise tax are presumed not to increase illicit cigarette trade even though there are considerable indications of an illicit cigarette market.

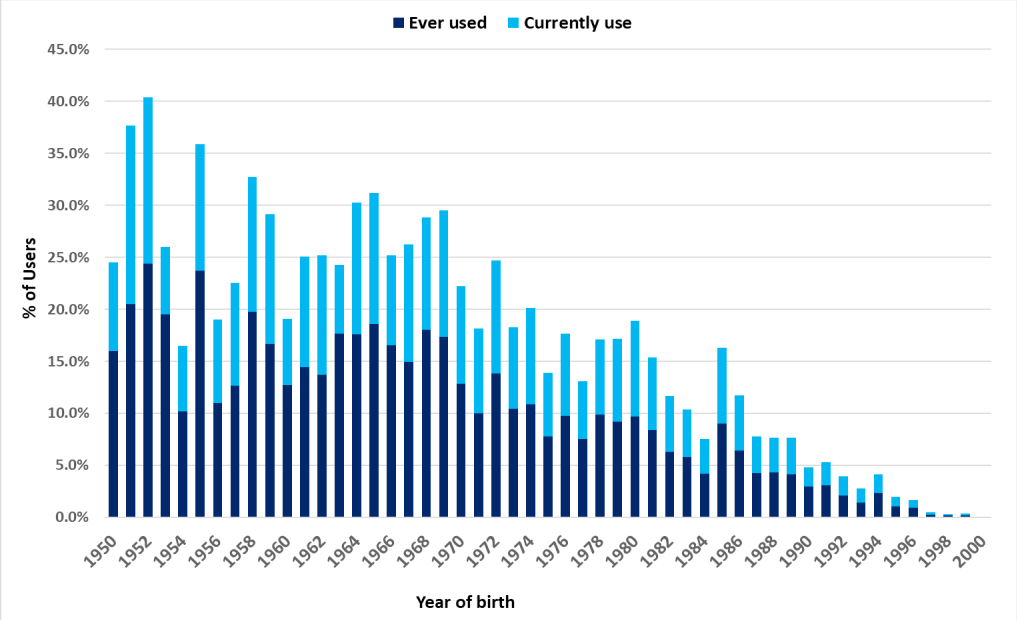
4. TOBACCO USE IN UGANDA: TRENDS IN CIGARETTE CONSUMPTION, EXCISE TAX AND EXCISE REVENUE

Tobacco use and prevalence

Evidence from the UNHS, UDHS and GATS shows that tobacco use continues to be more common among Ugandan men than women. The most recent UNHS (2016/17) reveals that 5.4 percent of Ugandans are currently using or have used tobacco and related products in the past (Uganda Bureau of Statistics, 2017). In addition, the same survey shows that males are more than four times more likely to report ever using tobacco products than females (8.5 percent vs 2 percent respectively).

The analysis also shows that the use of tobacco in Uganda has declined consistently during the past 30 years. Figure 1 plots the current and previous use of tobacco by year of birth based on the 2016/17 UNHS. It is indicated that the decline in use has been consistent across age group with individuals aged 45-50 years (i.e. individuals born between 1965 and 1970) registering the largest decline. On the other hand, based on current use, individuals aged 50-65 years exhibit the highest current use—on average more than 11 percent of individuals born between 1950 and 1965 are currently using tobacco products. The changes exhibited in Figure 1 could be partly attributed to tobacco control policies. For example, the 2015 Tobacco Control Act outlaws sale of tobacco products to persons considered minor i.e. aged less than 21 years. Furthermore, findings from UNHS surveys show that tobacco use has reduced by half during the past five years i.e. from about 11 percent in 2012/13 to 5 percent by 2016/17. Evidence from around the world shows that people in lower income and socio-economic brackets use tobacco products more (IARC 2011). In line with this, in 2016/17 tobacco use was highest among the males in the lowest wealth quintile and this trend was mirrored in the previous surveys. In fact, throughout the UNHS rounds, the highest tobacco use has consistently been found among men in the lowest wealth quintile.

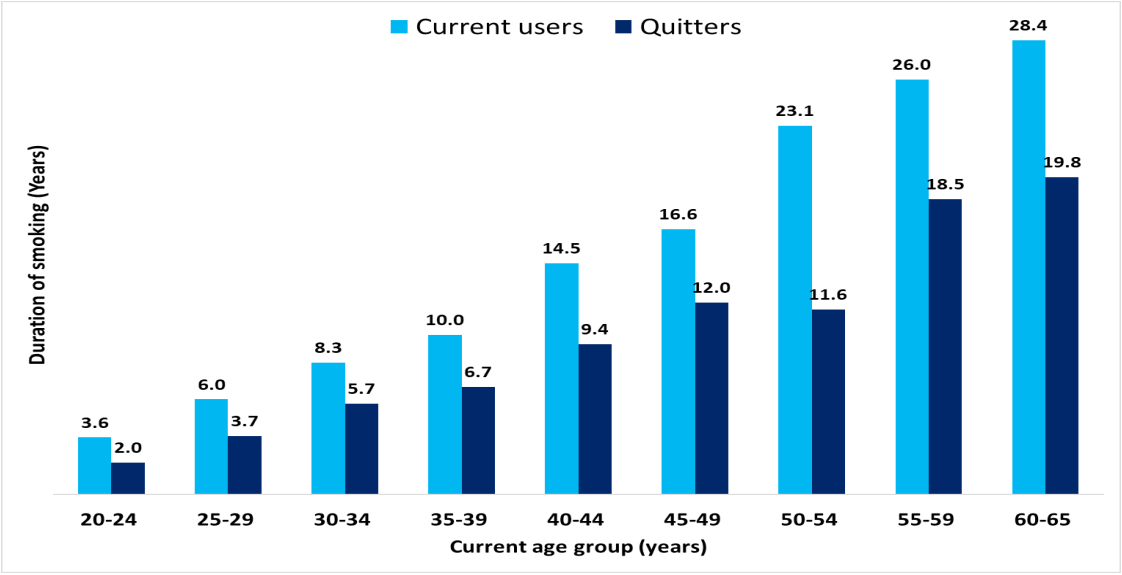
Figure 1: Trends in tobacco use by year of birth (%)



Source: Authors calculations from the 2016/17 UNHS

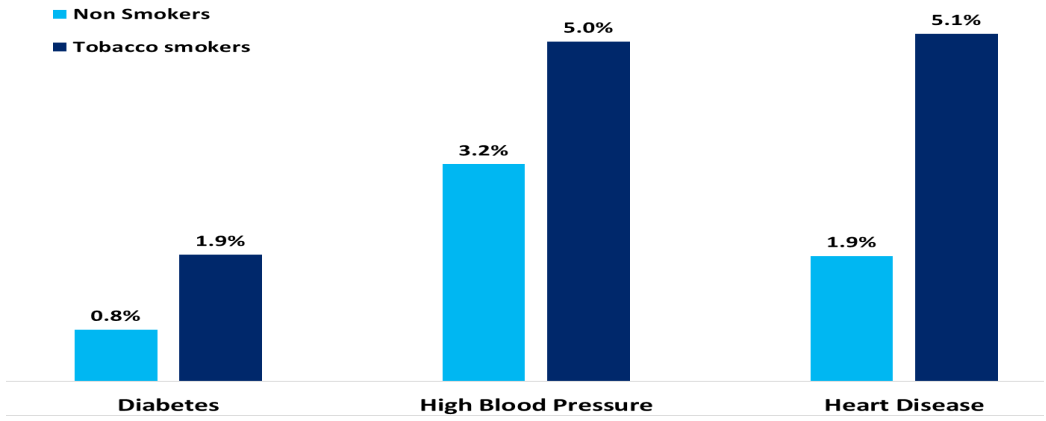
Furthermore, fewer young individuals are currently using tobacco products. The 2015 Tobacco Control Act also bans the involvement of minors below 21years of age in the sale and use of tobacco products. Hence, the above distribution may reflect proper enforcement of tobacco sales. However, the relatively low tobacco use among individuals aged less than 25 years could also be interpreted in the context of high unemployment among the youth—individuals currently not using tobacco may do so in the future if their income status changes. This is evidenced from the duration of smoking exhibited in Figure 2. Specifically, currently users aged 20-65 years have on average been smoking for 15 years while those who quit had on average smoked for 11.5 years. As would be expected, the highest duration smoking is among the elderly aged 60-65 years-who on average have been smoking 28.4 years. By age 35, most current smokers would have been smoking for 10 years.

Figure 2: Duration of smoking by age group, 2016/17 (years)



Source: Authors calculations from the 2016/17 UNHS

Figure 3: Tobacco use and health challenges in Uganda, 2016/17 (%)



Source: Authors calculations from the 2016/17 UNHS

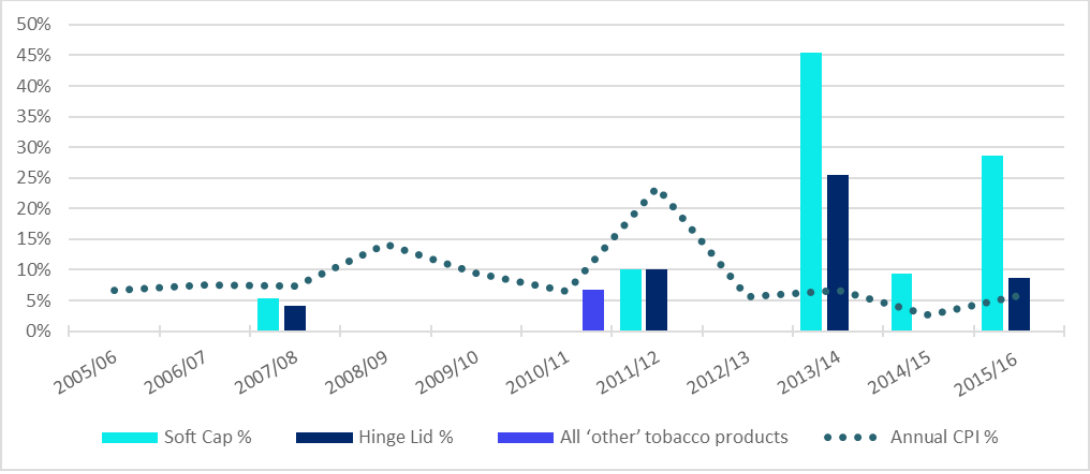
Despite the decline in tobacco use, tobacco use is a leading cause of non-communicable diseases in Uganda especially diabetes, high blood pressure and heart disease (CTCA 2017). Figure 3 compares the self-reported disease prevalence between individuals who have ever used and those who have never used tobacco. It illustrates that the prevalence for diabetes and heart disease is more than double among smokers i.e. 1.9 percent vs. 0.8 percent and 5.1% percent vs. 1.9 percent respectively. Overall, the chart shows that tobacco users have a higher likelihood of suffering from the three listed non-communicable disease.

4.1 Tobacco Excise tax and Revenue

4.1.1 Changes in Excise Tax

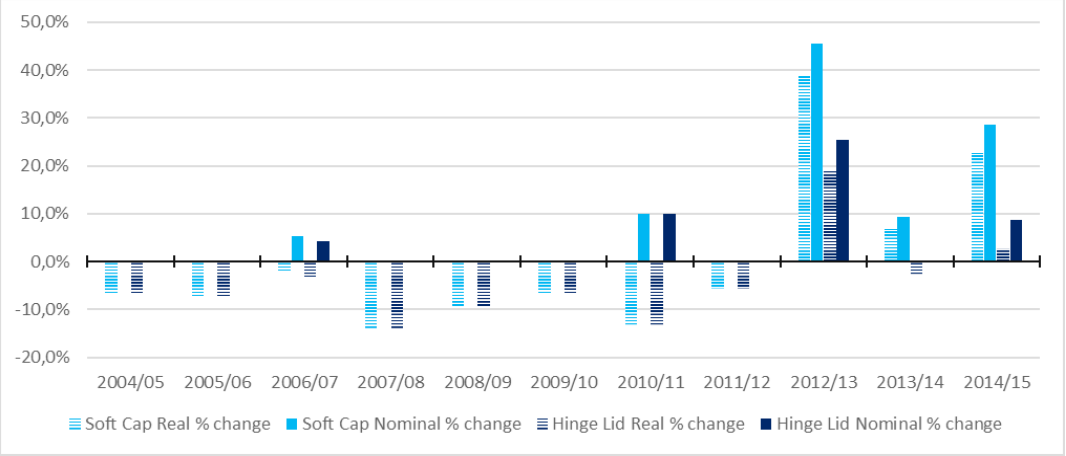
Although the excise tax rate has been increasing since 2011/12, this has not been at a regular or predictable rate as illustrated in Figure 4. Of the three major tobacco tax heads, the change in tax rate for soft cap cigarettes is consistently highest (although the rate is lower in actual terms), and has fluctuated in the last ten years. The excise tax diagnostic study by the World Bank (2017) finds that in the past 25 years, for every 1 percent increase in GDP the excise tax on cigarettes and other tobacco products has only increased by a meagre 0.18 percent and as such excise tax revenues on tobacco products are highly inelastic (World Bank, 2017). It is not clear the extent to which the tax increments are pegged to inflation and tax rates and revenues from tobacco products (particularly cigarettes) have not kept pace with the growth of the economy. Figure 4 illustrates that since FY 2005/6, the tax increment in 2013/14 was the first to rise by more than the inflation rate. This suggests that the current tax regime is not responding to affordability of tobacco

Figure 4: % change in excise tax rate



Source: Authors calculations from URA and BoU.

Figure 5: Nominal Vs Real tax changes



Source: Authors calculations from URA and BoU

products- one of the key factors affecting consumption.

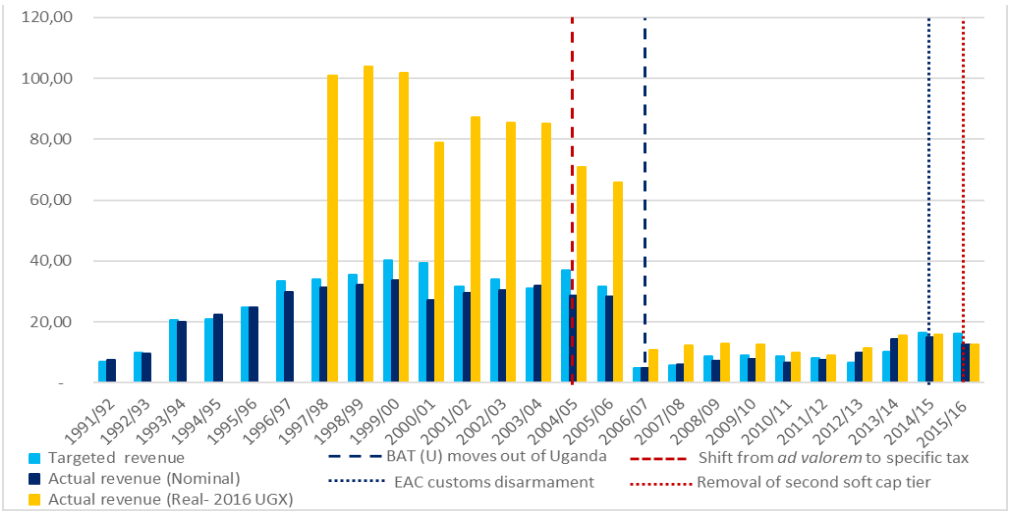
In fact, a comparison of the total changes in tax vis-à-vis the total change in CPI shows that from 2005/6 to 2015/16 taxes went up by 137 percent for soft cap cigarettes, 56 percent for hinge lid cigarettes and only 7 percent for all 'other' tobacco products. In the same time the CPI went up by 147percent. Figure 5 which compares the real and nominal changes in tax shows that in real terms, taxes have not been increasing by much.

4.1.2 Changes in Excise Revenue

Cigarette revenues over time are important to consider in a consumption analysis. If the state is primarily driven by increasing revenues trends in revenue collection and other factors influencing this revenue may have an impact on the taxation policy that is ultimately pursued. Figures 6 and 7 below illustrate the changes in revenue collection from cigarettes, highlighting some key events (outside of the tax rate) that may have impacted this revenue.

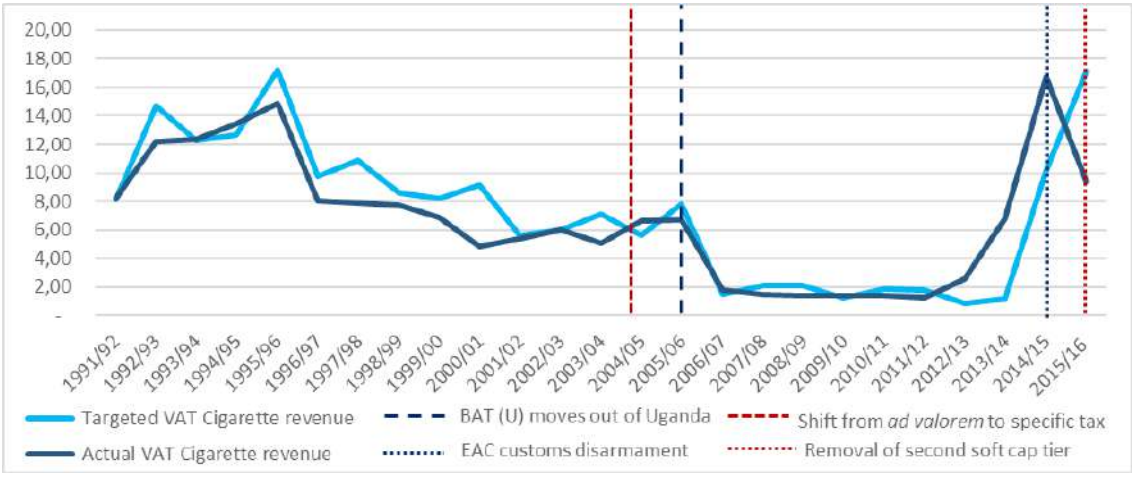
Between 1999 and 2005, excise revenue from cigarettes rose steadily- reaching a peak of UGX 33.6 billion shillings in 1999/00. During this period, actual revenue was below the targeted revenue for the most part. In 2006 there was a significant decline in the revenue collection of excise tax on cigarettes. This was the result of the relocation of BAT (U) to Nairobi. At the time, BAT (U) was the country's leading cigarette manufacturer with a market share of about 80 percent

Figure 6: Excise Cigarette revenue (UGX Billion)



Source: Authors calculations from URA and BoU

Figure 7: Cigarette VAT revenue (UGX Billion)



Source: Authors adaptation from URA

(World Bank, 2017b). In FY 2004/05 the tax changed from an *ad valorem* to specific rate, with minimal changes in revenue realised. Specifically, the excise duty on cigarettes in 2004/5 were US$ 16.4 million—similar to excise duty realised in 2003/4 (Uganda Revenue Authority, 2017).

On the other hand, after the relocation of BAT(U) to Nairobi excise tax revenues dropped sharply from UGX 28.3 billion (about US$ 15.7 million) to a 20-year low of UGX 4.94 billion (about US$ 2.7 million). Revenues have since undergone a gradual increase although this was more recently disrupted by the Common External Tariff through which tobacco products made within the EAC became domestic goods. In addition, real tax revenue expressed in 2016 Shillings[18] has been declining. As illustrated in figure 7 below, a slightly different pattern is observed in the VAT revenue collections, which were steadily declining from 1995/6 to 2005/6, and then rose sharply in 2014/5. The surge in VAT taxes in 2014/15 is explained by the change in the price of the leading cigarette brand—Sportsman whose average price increased by 11% in September 2014 (Uganda Bureau of Statistics, 2014).[19]

Encouragingly for tobacco control efforts, dependence on tobacco tax revenue has declined significantly over the last 30 years. During 1991/92-2000/1, tobacco products contributed on average 30 percent to total excise tax collections. In the next 10 years (2001/2-2010/11), the share of cigarettes in excise taxes averaged 13 percent. For the period 2011/12-2015/16, this stands at only 2.2 percent of the total domestic excise revenue.

5. SIMULATION OF PROBABLE TAX CHANGES ON CONSUMPTION

5.1 Simulation specifics

To understand the likely effects of tobacco taxation on consumption, we undertake a simulation exercise, as well as a sensitivity analysis of the model. The purpose of the simulation exercise is twofold, the first is to estimate the changes in cigarette consumption resulting from a change in excise taxes and the second is to demonstrate that higher incomes and therefore GDP unresponsive taxes stifle tobacco control efforts. The inputs for the simulations are based on information from MoFPED and URA (2017), World Bank, UBOS etc. and some of the default parameters for low and middle-income countries where data is unavailable.

In all simulations, the total adult population (20.5 million in 2017 or 19.93 million in 2016) is derived from the total number of people in the population age 15 years and above. Although different institutions may set the age of adulthood higher (at 18 years) all the surveys collecting data on substance ab(use) use 15 years and above or in the case of the UNHS 10 years and above. In addition, data from the GYTS shows a higher

18 Calculated by taking Financial year CPI data from the Bank of Uganda

19 **Sportsman** is the leading cigarette brand in Uganda—accounting for 58% of the market share followed by **Supermatch** at 26% (MoFPED and URA, 2017).

smoking prevalence for the youth, hence the inclusion of these age groups in this input for the model. The following analysis from the simulations concentrates exclusively on cigarettes (sticks) and does not make a distinction between soft-cap and hinge-lid because there is insufficient disaggregated data to input in the model. The model uses inputs related to the soft-cap cigarettes as they make up a significant proportion of the market (90 percent).

5.2 Short-term simulations

4.2.1 MoFPED and URA (2017) simulation

The first simulation builds on the analysis from MoFPED and URA (2017)—while this study focused primarily on the fiscal impacts of changes in the cigarette excise taxes, we simulate the consumption impacts of similar changes. Some of the proposed tax structure changes from the MoFPED and URA (2017) study which targeted harmonising the tiers and thereafter raising the tax rate are illustrated in Table 2 below. The objective of the MoFPED and URA (2017) simulation was to gauge the revenue impacts of raising the share of the excise tax in retail price from 31 to 52 percent. MoFPED and URA (2017) used 2015/16 as the base year, two scenarios - 1a and 1b- were put forward for FY 16/17. It is known from Table 2 that scenario 1a was the one that was eventually implemented. The estimates indicate that total government revenue would increase by 20% under scenario 1a and only 17.8 percent under scenario 1b. Furthermore, the volume of cigarette sold would reduce by 4.7 percent under scenario 1 and -5.8 percent under scenario 2. Against this background, the first short-term simulation tests the consumption and public health implications of MoFPED and URA (2017) scenarios 1a and 1b.

While the projected change in the quantity of cigarettes sold from the simulations by MoFPED and URA (2017) is a component of consumption, more specific analysis is needed to illustrate the bigger picture—especially, the projected changes in smoking prevalence i.e. how much more or less consumers would be buying as a result of proposed changes.

Tables 3 provides the inputs used in the re-simulation for Scenario 1 (impact of the actual tax change that was implemented in FY 2016/17) and Scenario 2 (the proposed higher increment). Based on the inputs in Table 3 and using 2015/16 as the base year, we

Table 2: Results from MoFPED and URA (2017) Simulations

Items	Baseline	MoFPED and URA *Scenario 1*	MoFPED and URA *Scenario 2*	MoFPED and URA *Scenario 3*	MoFPED and URA *Scenario 4*
	2015/16	2016/17	2016/17	2017/18	2018/18
Excise tax rates					
Hinge Lid (UGX)	75,000	80,000	80,000	80,000	85,000
Soft Cap (UGX)	45,000	50,000	60,000	80,000	85,000
Change in Tax (%)- Soft Cap	-	11.11%	33.33%	33.33%	6.25%
Average nominal price/pack (UGX)	3,041	3,162	3,397	3,849	3,966
Change in real prices (%)		4.00%	11.70%	13.30%	3.10%
	Panel B: Simulated impacts on quantity sold				
Quantity of cigarettes sold (Milles)	**1,309,346**	**1,313,088**	**1,248,289**	**1,175,454**	**1,185,963**
Change quantity sold (%)		**0.30%**	**-4.70%**	**-5.80%**	**0.90%**
Excise tax share in price (%)	31.60%	33.60%	36.60%	41.60%	42.90%
Total tax share in price (%)	40.40%	42.60%	45.60%	50.30%	51.80%

Sources: MoFPED and URA (2017)

Table 3: Inputs for MoFPED and URA (2017) scenario 1 and 2

Inputs	Baseline FY 2015/16	MoFPED and URA Scenario 1, 2016/7	MoFPED and URA Scenario 2, 2016/7
Excise tax rate (UGX)	*45,000*	*50,000*	*60,000*
Excise tax a % of retail price at the outset	-	31.60	31.60
VAT percentage	-	18	18
Price elasticity of demand	-	-0.6	-0.6
Percentage increase in excise tax	-	11.11	33.33
Percentage change in industry price	-	4	12
Percentage of the consumption decrease due to decreased smoking prevalence*	-	50*	50*
Adult population (millions)	-	19.93	19.93
Smoking Prevalence (%) at the outset	-	5	5
Percentage of lives saved due to quitting	-	35*	35*

**Denotes default parameter inputs from TETSim*

estimate how consumption changed with the tax change that was enacted (MoFPED and URA Scenario 1) in comparison to how it could have changed if MoFPED and URA scenario 2 had been implemented. The price elasticity chosen is -0.6. Due to the segmentation of the cigarettes market in Uganda, earlier studies (e.g. MoFPED and URA, 2017) adopted a price elasticity of demand at -0.2 and -0.6 for hinge lid and soft cap cigarettes respectively. This is done to reflect that consumers of more expensive brands are less price sensitive. In the simulation exercise, elasticity is assumed to be -0.6 (except when the model is testing the impact of different elasticity levels). The simulation uses -0.6 as the price elasticity of demand while other inputs are sourced from UBOS and URA databases.

Table 4 provides the output results from the simulation of the MoFPED and URA (2017) excise tax proposals. It is indicated that an 11.11 percent excise tax increase in 2016/17 yielded a reduction in cigarette consumption of 6.25 percent whereas an excise tax increase of 33.33 percent would have resulted in 8.36 percent reduction. The difference in the reduction of cigarette consumption between the two scenarios is 2.11 percentage points. In the first scenario the change in smoking prevalence was marginally higher than the change in smoking intensity; while in the second the reduction in consumption was mostly driven by the change in smoking intensity. In addition, the simulation estimates that 81,000 people quit smoking with the tax change that was implemented—this is equivalent to at least 28,000 more people quitting than the case in the second scenario.

Table 4 Simulation Results from the MoFPED and URA Proposed changes: scenario 1 and 2

Outputs	Baseline FY 2015/16	MoFPED and URA Scenario 1, 2016/17	MoFPED and URA Scenario 2, 2016/17
Excise tax rate (UGX)	*45,000*	*50,000*	*60,000*
Estimated changes (%)			
Initial total tax burden	-	53.04	53.04
New total tax burden	-	56.15	54.54
Percentage change in:			
Retail price	-	11.36	15.68
Cigarette consumption	-	-6.25	-8.36
Smoking prevalence	-	-3.22	-4.36
Smoking intensity	-	-3.12	-5.68
Quitting impact			
Initial number of smokers (Millions)	-	2.500	2.500
New Number of smokers (millions)	-	2.419	2.391
Number of people quitting (Millions)	-	0.081	0.109
Number of lives saved (Millions)	-	0.028	0.038

5.2.2 Other short-term simulations

The next set of simulations in Table 5 use 2017 as the baseline year (after the implementation of the first scenario in the previous section) and make the following adjustments to the default inputs.

- **Sensitivity analysis**: First we test the sensitivity of the model using different elasticities within the expected range (-0.4 to -0.8) for low and middle-income countries (Jha and Chaloupka, 1999). The lower price elasticity of demand (-0.4) is tested in **a** while -0.6 will be tested in **b** and the higher elasticity of -0.8 in **c**, all will be using an 11 percent tax increment
- **Scenario 1**: An increase in the tax rate for FY 18/19 by UGX 10,000 to 65,000 per mille (18.18 percent increase): Using an elasticity of -0.6,
- **Scenario 2:** An increase in the tax rate for FY 18/19 by UGX 15,000 to 70,000 per mille (27.27 percent increase): Using an elasticity of -0.6,
- **Scenario 3**: Estimates what would happen if the current tax on soft cap was raised to meet the hinge lid tax- rising from UGX 55,000 to UGX 80,000 per mille.

Table 5: Short-term simulation results

	Sensitivity test			Scenario 1	Scenario 2	Scenario 3
	a	b	c			
Inputs						
Excise tax as % of retail price at the outset	32	32	32	32	32	32
VAT percentage	18	18	18	18	18	18
Price elasticity of demand	-0.4	-0.6	-0.8	-0.6	-0.6	-0.6
Percentage increase in excise tax	11	11	11	18	26	45
Percentage change in industry price	10*	10*	10*	10*	10*	10*
Percentage of the consumption decrease due to decreased smoking prevalence	50*	50*	50*	50*	50*	50*
Adult population (millions)	20.5	20.5	20.5	20.5	20.5	20.5
Smoking Prevalence (%) at the outset	5	5	5	5	5	5
Percentage of lives saved due to quitting	35*	35*	35*	35*	35*	35*
Outputs						
Estimated changes (%)	**a**	**b**	**c**	**Scenario 1**	**Scenario 2**	**Scenario 3**
Initial total tax burden	47.25	47.25	47.25	47.25	47.25	47.25
New total tax burden	47.43	47.43	47.43	48.66	50.16	52.91
Percentage change in:						
Retail price	10.38	10.38	10.38	13.02	16.42	23.22
Cigarette consumption	-3.87	-5.75	-7.59	-7.08	-8.71	-11.75
Smoking prevalence	-1.97	-2.96	-3.95	-3.67	-4.55	-6.24
Smoking intensity	-1.93	-2.87	-3.80	-3.54	-4.35	-5.87
Quitting impact						
Initial number of smokers (Millions)	1.025	1.025	1.025	1.025	1.025	1.025
New Number of smokers (millions)	1.005	0.995	0.985	0.987	0.978	0.961
Number of people quitting (Millions)	0.020	0.030	0.040	0.038	0.047	0.064
Number of lives saved (Millions)	0.007	0.011	0.014	0.013	0.016	0.022

**Denotes default parameter input*

5.2.3 Analysis of the outcomes

The sensitivity test illustrates the importance of having accurate elasticity figures for aggregate variables like cigarette consumption, smoking prevalence and smoking intensity. However, the variation in the absolute figures indicating number of smokers, number of people quitting is much smaller. The difference in the reduction of consumption between **a** and **b** is 1.88 percentage points and 1.84 percentage points between **b** and **c**.

Scenarios 1, 2 and 3 look at the impact of the different increments in tax rates. While increasing the tax by UGX 10,000 (about US$ 3) would result in a 7.1 percent reduction in consumption, increasing by UGX 15,000 (US$ 4.2) would result in an 8.7 percent reduction indicating that more significant increases are needed. This is then tested in scenario 3 which is based on the goal to unify the tax rates of the soft cap and Hinge lid tiers. If this was done in a singular change, it would require a rather large increment of 45 percent as the rate for soft cap is UGX 55,000 and hinge-lid is UGX 80,000. Nonetheless, looking back at the unification of the two soft cap tiers in 2015/16[20] shows that there is precedent for such a substantial hike. Both Soft cap taxes rose by 45.5 percent and 40 percent in 2013/14 before the harmonisation in 2015/16. Marquez and Moreno-Dodson (2017) argue that effective tax strategies combine big initial tax increments followed by recurrent hikes over time. Scenario 3 would be one such case. Scenario 3 would not only increase the tax burden, but would also result in an 11.8 percent reduction in cigarette consumption with up to 64,000 people quitting.

5.3 Long-term simulations

These simulations use 2017 as the base year and look at the possible impact of different income and tax levels over time.

- **Scenario 1**: As illustrated earlier in Table 1, changes in tax have been irregular over the years. In this scenario the input for 'annual percentage increase in excise tax' is derived from the average change (16.56 percent rounded up to 17) in tax for Soft cap cigarettes since the unification of that tier in 2015/16. For this scenario, the annual percentage increase in aggregate income is derived from the average GNI per capita growth over the same period.

- **Scenario 2**: This uses the same rationale as scenario 1 but instead takes into consideration the average yearly tax rate increments since the switch to a specific tax in 2004/5- this put 'Annual percentage increase in excise tax' at 14 percent. For this scenario, the annual percentage increase in aggregate income is derived from the average GNI per capita growth over the same period.

- **Scenario 3**: Using the same 'Annual percentage increase in excise tax' as scenario 2 (14 percent), this scenario make adjustments to the aggregate income input testing at the lowest income growth rate over the last 10 years.

- **Scenario 4**: Building from scenario 3, this scenario makes adjustments to the aggregate income input testing at the highest income growth rate over the last 10 years.

Scenarios 3 and 4 use a ten-year parameter because the long-term model projects 10 years forward. The average over ten-year period is similar to the average from 2004/5 so it is not simulated again.

5.3.1 Analysis of the outcomes

Results from scenario 1 and 2 reaffirm the findings from the short-term simulations- showing that increases in the tax need to be larger. Maintaining the same average tax increment at 14 percent over a 10-year period even with low growth in income stifles the potential to reduce consumption. This is even more important when scenario 3 and 4 are considered, showing the impact of increasing or stationary aggregate incomes on consumption levels. In scenario 3, zero or negative growth in incomes with the average tax changes yield significant reductions in both prevalence and intensity.

20 See Table 1

Table 6: Long-term simulation results

	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
Inputs[2]								
Excise tax as % of retail price at the outset	32.0		32.0		32.0		32.0	
VAT percentage	18.0		18.0		18.0		18.0	
Price elasticity of demand	-0.6		-0.6		-0.6		-0.6	
Annual % increase in excise tax	17.0		14.0		17.0		17.0	
Annual % increase in aggregate income	1.75		1.75		0 (-0.043)		8 (7.508)	
Adult population (millions)	20.5		20.5		20.5		20.5	
Annual percentage increase in adult population	3.3		3.3		3.3		3.3	
Smoking Prevalence (%) at the outset	5.0		5.0		5.0		5.0	
Outputs								
Estimated changes (%)	Over 10-year period	Average per year	Over 10-year period	Average per year	Over 10-year period	Average per year	Over 10-year period	Average per year
Per Pack								
Retail price	209.07	11.95	158.49	9.96	158.49	9.96	158.49	9.96
Excise tax	380.68	17.00	270.72	14.00	270.72	14.00	270.72	14.00
VAT	209.07	11.95	158.49	9.96	158.49	9.96	158.49	9.96
Total tax	338.48	15.93	243.12	13.12	243.12	13.12	243.12	13.12
Industry Price	62.89	5.00	62.89	5.00	62.89	5.00	62.89	5.00
Tobacco control outcomes								
Quantity	-33.35	-3.98	-25.82	-2.94	-43.42	-5.54	-4.41	-0.45
Per Capita Consumption	-39.67	-4.93	-32.89	-3.90	-48.78	-6.47	-13.46	-1.44
Smoking prevalence	-22.57	-2.53	-18.22	-1.99	-28.83	-3.34	-7.00	-0.72
Smoking intensity	-22.07	-2.46	-17.89	-1.95	-28.03	-3.24	-6.95	-0.72
Quitting and mortality impact	**Initial value**	**After 10 years**	**Initial value**	**After 10 years**	**Initial value**	**After 10 years**	**Initial value**	**After 10 years**
Adult population	20.500	22.645	20.500	22.645	20.500	22.645	20.500	22.645
Number of smokers	1.025	0.877	1.025	0.926	1.025	0.806	1.025	1.053
Number of Quitters and or non-starters (cumulative)	-	0.243	-	0.196	-	0.310	-	0.076
Number of lives saved (Cumulative)	-	0.085	-	0.069	-	0.109	-	0.027

6. CONCLUSION AND POLICY IMPLICATIONS

This paper's focus on consumption is driven by the need to monitor, measure and analyse the intensity and distribution trends of tobacco use- considering its health and economic costs. The aim was to generate evidence to inform the design of current and future tobacco taxation reforms. Uganda still has a lot of room to improve its excise duty regime to match the World Health Organization protocol and best practices. More effective tax policies for tobacco control need to eliminate the tiers in the excise tax structure, increase specific tax rates pegged to inflation and aggregate incomes and develop better administration of tobacco substitutes and tobacco products other than cigarettes. In addition to this it is important that the preferential tax rates set for locally produced tobacco and related products are eliminated. Locally manufactured cigarettes are taxed differently from imported ones in a bid to encourage local production. From a health perspective though, they are no less dangerous and should be taxed the same.

The data gaps encountered in this paper illustrate the need for more standardised surveys on the prevalence of tobacco use, while the substance abuse sections in the national surveys need to be enhanced. This is necessary for the identification of and construction of useful indices from which the design and impact of tobacco control activities can be based and measured. Going forward, there is a need to build on the existing research. With URA and MoFPED evidence on the direct revenue implications of tax changes, CTCA evidence on the cost of tobacco consumption and these estimations on the consumption implications on tax changes; it should be possible to estimate the indirect revenue impact of changes in taxation. For example, what would be the change in healthcare costs as a result of a given tax-related consumption change?

Cigarette excise taxes in Uganda are levied as a specific tax which is easier to administer although susceptible to being undercut by inflation. This is well demonstrated in the long-term simulation which show the impact of growing incomes on tobacco consumption. Ideally, to combat the negative effects of tobacco consumption on society, tax strategies for tobacco products should focus on health gains first before the short-term revenue benefits. Having already simulated the immediate revenue implications of increasing the tax rate and changing the structure, it is important to now take into consideration the longer-term health revenue impacts. Results from the short-term simulations in combination with analysis from the UNHS and CTCA study show that certain tax increments could result in fewer smokers, more people quitting and more lives saved thereby reducing the financial burden on the public health system. Results from the long-term simulations show that incomes are a big factor in consumption, thereby underlying the importance of pegging tax changes to inflation.

The main taxation policy implications are therefore:

- Unification of the tax tiers should be made a priority because of the high price dispersion which in essence allows the tobacco industry to protect the price sensitive consumers
- Uganda needs to work towards meeting the WHO recommended proportion of tax on tobacco retail prices
- Changes in tax rates need to be made regularly and consistently
- Changes in tax rates MUST take into account factors contributing to affordability like incomes and inflation. Even if revenue is indeed the main objective of Ugandan tobacco taxation, not taking inflation and income growth into consideration affects and undermines real revenue
- National surveys should enhance the type and amount of data collected on tobacco use to facilitate the processes of calculating elasticities and better illustrate the impact of tobacco control policies.
- Preferential tax rates for domestically produced cigarettes need to be removed as there should be no incentives given to cigarette production.

7. REFERENCES

Azagba, S. Sharaf, M. (2011), "Cigarette taxes and smoking participation: evidence from recent tax increases in Canada". *Int J Environ Res Public Health,* 8:1583–600.

British American Tobacco (BAT). (2017), *Annual Report and Financial Statements for the year ended 31st December 2016*.

Brown, T. Platt, S. Amos, A. (2014), "Equity impact of interventions and policies to reduce smoking in youth: systematic review". *Tobacco Control,* 23(e2):e98–105.

Centre for Tobacco Control in Africa (CTCA). (2017), *Health Cost of Tobacco Use in Uganda,* (Kampala: Centre for Tobacco Control in Africa)

Chaloupka F.J and Wechsler, H. (1997), "Price, tobacco control policies and smoking among young adults". Journal of Health Economics Vol 16 :359–73.

Chaloupka F.J., Straif, K., Leon, M.E. (2011), "Effectiveness of tax and price policies in tobacco control". *Tobacco Control*, 20: 235–8.

Chaloupka, F.J., and Warner, K.E. (2000), "The Economics of Smoking." *Handbook of Health Economics* 1B: 1539–1627.

Chaloupka, F.J., Hu, T.W., Warner, K.E., Jacobs, R., Yurekli, A. (2000), "The taxation of tobacco products". In: Jha P, Chaloupka FJ, editors. *Tobacco control in developing countries.* Oxford University Press; Oxford and New York: 2000. pp. 237–72

Chaloupka, F.J., Kostova, D. and Shang, C. (2014), "Cigarette excise tax structure and cigarette prices: Evidence from the global adult tobacco survey and the US National Adult Tobacco Survey". *Nicotine & Tobacco Research*; Vol.16, Supplement 1:S3–9.

Chaloupka, F.J., Pacula, R.L. (2001), The impact of price on youth tobacco use. In *Changing Adolescent Smoking Prevalence—Where It Is and Why, Smoking and Tobacco Control Monograph No. 14*; Burns, D.M., Ed.; National Cancer Institute: Rockville, MA, USA, 2001; pp. 93–99.

DeCicca, P., Kenkel, D. and Liu, F. (2013), Who Pays Cigarette Taxes? The Impact of Consumer Price Search, *The Review of Economics and Statistics*, Volume 95, Issue 2, pp516-529

Dhar, S.K., Hoch, S.J. (1996) "Price discrimination using in-store merchandising". J Mark 1996; 60:17–30.

Ezzati, M. and Lopez, A.D. (2003), "Estimates of global mortality attributable to smoking in 2000". *Lancet*. 362: 847-852.

Farrelly, M.C. and Bray, J.W. (1998), "Responses to increases in cigarette prices by race/ethnicity, income, and age groups – United States, 1976–1993". *Morb Mort Wkly Rpt* 47(29):605-9.

Gallet, C, and List, J. (2003), "Cigarette demand: a meta-analysis of elasticities". *Health Economics* Vol 12: No:10: 821–35.

Gilmore, A.B., Tavakoly, B., Taylor, G. et al (2013), "Understanding tobacco industry pricing strategy and whether it undermines tobacco tax policy: the example of the UK cigarette market". *Addiction* ;108:1317–26.

Global Youth Tobacco Survey (GYTS). (2008), *The Uganda Global Youth Tobacco Survey Report*. Available at: http://www.who.int/tobacco/surveillance/Uganda__Brazzaville08.pdf

Golden, S.D., Farrelly, M.C., Luke, D.A. et al., (2016), "Comparing projected impacts of cigarette floor price and excise tax policies on socioeconomic disparities in smoking" *Tobacco Control* Vol 25 (Supplement 1): i60-i66.

Hanson, A. and Sullivan, R. (2009), The Incidence of Tobacco Taxation: Evidence From Geographic Micro-Level Data, *National Tax Journal*, 62:4, pp. 677-98

International Agency for Research on Cancer (IARC), (2011) "Effectiveness of Tax and Price Policies for Tobacco Control". *IARC Handbook of Cancer Prevention*. Volume 14: Tobacco Control

Islam, S.M.S., Purnat, T.D., Phuong, N.T.A., Mwingira, U., Schacht, K., and Fröschl, G. (2014), "Non Communicable Diseases (NCDs) in developing countries: a symposium report". *Globalization and Health*, Vol 10, 81. http://doi.org/10.1186/s12992-014-0081-9

Jha P and Chaloupka F, eds. (1999), *Tobacco Control in Developing Countries*. Oxford University Press on behalf of The Human Development Network, the World Bank, and The Economics

Advisory Service, World Health Organization.

Jha, P and Chaloupka, F.J. (1999), *Curbing the epidemic. Governments and the Economics of Tobacco Control.* Washington DC, World Bank.

Marquez, P.V., and Moreno-Dodson, B. (2017), *Tobacco Tax Reform at the Crossroads of Health and Development: A Multisectoral Perspective*. World Bank, Washington, DC. ©, available at: https://openknowledge.worldbank.org/handle/10986/28494

Merriman, D. (2002), Understand, measure and combat tobacco smuggling. In: Yurekli, A. and de Beyer, J. eds. *Economics of tobacco toolkit. Tool 7, Smuggling*. Washington, DC, World Bank (http://siteresources.worldbank.org/INTPH/Resources/7Smuggling.pdf, accessed 08th September 2017).

Ministry of Finance, Planning & Economic Development (MoFPED) and Uganda Revenue Authority (URA). (2017), *Report of the Technical Working Group on Tobacco Taxation in Uganda*

Ross, H., and Chaloupka, F.J. (2003), "The effect of cigarette prices on youth smoking". *Health Economics* Vol 12: 217–30.

Ross, H., Blecher, E., Yan, L. et al. (2011), "Do cigarette prices motivate smokers to quit? New evidence from the ITC survey". *Addiction* 2011; 106:609–19.

Saenz de Miera J.B, Thrasher, J.F., Shigematsu, L.M. et al. (2014), "Tax, price and cigarette brand preferences: a longitudinal study of adult smokers from the ITC Mexico Survey". *Tobacco Control,* Volume 23 (Suppl 1):i80–5.

Shang, C. et al., (2014), "The distribution of cigarette prices under different tax structures: findings from the International Tobacco Control Policy Evaluation (ITC) Project" *Tobacco Control,* Volume 23(0 1)

Sung, H.Y. Wang, L., Jin, S. Hu, T.W., Jiang, Y. (2006), "Economic burden of smoking in China, 2000". *Tobacco Control* Volume 15.(suppl 1):i5-i11.

Uganda Bureau of Statistics (2014), *Consumer Price Index September 2014* (Kampala: Uganda Bureau of Statistics)

Uganda Bureau of Statistics (2017), *2016/2017 Uganda National Household Survey* (Kampala: Uganda Bureau of Statistics)

US Department of Health and Human Services (2014), "The Health Consequences of Smoking: 50 Years of Progress". *A Report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services*, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

van Hasselt, M., Kruger, J., Han, B. et al (2015), "The Relation Between Tobacco Taxes and Youth and Young Adult Smoking: What Happened Following the 2009 U.S. Federal Tax Increase on Cigarettes?" *Addictive Behaviors* 45: 104-109.

Van Kinh, H., Ross, H. Levy, D. et al., (2006), "The effect of imposing a higher, uniform tobacco tax in Vietnam". *Health Research Policy Systems*, Vol 4. No. 6:

Wasserman, J., Manning, W.G., Newhouse, J.P. and Winkler, J.D. (1991), "The effects of excise taxes and regulations on cigarette smoking". *Journal of Health Economics,* 10:43-64.

World Bank (1999), *Curbing the epidemic: governments and the economics of tobacco Control*. Series: Development in practice. (Washington DC: The World Bank) http://www1.worldbank.org/tobacco/reports.htm

World Bank (2016), GNI per capita, Atlas Method (Current US$) accessed at: https://data.worldbank.org/indicator/NY.GNP.PCAP.CD?order=wbapi_data_value_2014+wbapi_data_value+wbapi_data_value-last&sort=desc

World Bank (2017b), "Improving Domestic Resource Mobilization in Uganda: Background paper 2: Excise Duty Diagnostic" Draft Report.

World Health Organization (WHO). (2008), *WHO Report on the Global Tobacco Epidemic, 2008: The MPOWER package*, World Health Organization. Geneva, Switzerland. Available at: http://www.who.int/tobacco/mpower/mpower_report_full_2008.pdf

World Health Organization (WHO). (2010), *WHO technical manual on tobacco tax administration*. World Health Organization. Geneva, Switzerland

World Health Organization (WHO). (2017), *Tobacco and its environmental impact: an overview*, World Health Organization. Geneva, Switzerland

(Endtnotes)

1 For FY 2017/18, these are rates set as per the 2017 Excise Tax Amendment bill.

2 Input variables kept at their default values are not included in this table.

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