A SIMULATION EXERCISE FOR AN ADDITIONAL LEVY ON TOBACCO PRODUCTS IN NAMIBIA

Prepared under the Economics of Tobacco Control Community of Practice led by the World Bank

Memorandum to Mr Bevan Simataa, Commissioner of Customs and Excise, Ministry of Finance

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INTRODUCTION

Cross-country experience shows that imposing high tobacco taxes to raise the price of tobacco is the most effective way of reducing tobacco consumption and the resulting socio-economic costs: unnecessary mortality and morbidity, high health care costs and lost productivity.\(^1\)\(^2\) The reason is that, even though nicotine is highly addictive, an increase in the price of tobacco reduces smoking by discouraging young people to start smoking, by encouraging current smokers to quit, and by helping to prevent quitters to relapse. In fact, there is consensus among economists that, of all tobacco control tools available (e.g. advertising bans, smoke-free policies, youth access controls, etc.), raising the excise tax is the single most effective way of reducing tobacco consumption. Furthermore, raising the excise tax also increases excise tax revenue.

Currently cigarettes in Namibia are subject to an excise tax of N$ 10.92 per pack. The revenues generated by this excise tax are collected in the SACU Common Revenue Pool, and is distributed to the various countries by means of the revenue sharing formula.

The Tobacco Control Act of 2010 provides for a levy on the import, distribution or sale of tobacco products. Should such a levy be imposed, it would not flow to the SACU Common Revenue Pool, but be available for sole use of Namibia. As it currently stands, Namibia has very little control over the magnitude of the excise tax. Even if it were able to increase the excise tax on tobacco, the additional revenues would flow to the Common Revenue Pool, and Namibia would receive only a very small proportion of the additional revenues, given that it comprises a very small proportion of SACU GDP.

At the request of the Ministry of Finance, the World Bank assembled a team of specialists to expand the Ministry’s capacity on a number of aspects: (1) understanding how the imposition of an

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additional levy on tobacco would influence both tobacco consumption and government revenue, (2) how a change in tobacco consumption would impact health outcomes and (3) the control of illicit trade. This memorandum considers only the first point. The workshop was held in Windhoek on 16-17 May 2013, and was attended by between 25 and 30 officials from the Department of Customs and Excise.

**SOME HISTORICAL PERSPECTIVE**

Unfortunately data on cigarette consumption and cigarette prices in Namibia are not available for any length of time. However, South Africa’s tobacco taxation experience should closely approximate that of Namibia, given the close economic and historic ties between the two countries.

The aim of this section is to show that an increase in the tax on cigarettes has had very beneficial public health and fiscal consequences in South Africa, and that the relationships between excise tax, prices and consumption have been very stable over many years. The stability of this relationship is crucial in the simulation exercise that is presented in the next section.

The relationship between real (inflation adjusted) cigarette prices and aggregate consumption is shown in Figure 1. Between 1961 and the early 1990s aggregate cigarette consumption increased steadily because of an increasing population and a decrease in the real price of cigarettes. This changed dramatically in 1994. In 1994 the South African government announced that it intended to raise the excise tax on cigarettes such that the total tax burden (i.e. the sum of excise tax and VAT) would be 50% of the average retail price. This resulted in very substantial increases in the excise tax in the middle 1990s. In 1997 the government announced that it had achieved the target of a 50% total tax burden. Since 1998 the government passively increased the excise tax in order to maintain the target 50% tax burden. The only change came in 2004, when the target total tax burden was increased to 52% of the retail price of the most popular price category.

After 1997 increases in the excise tax were driven primarily by increases in the industry price, sometimes called the net-of-tax price. The industry price is controlled by the cigarette manufacturers (specifically British American Tobacco, which hold a market share of more than 90% of the legal market).

As a light diversion it is important to briefly discuss the composition of the retail price, because this is important for the simulation model discussed further down. In Figure 2 the real retail price is broken into three easily identifiable components: (1) the VAT (or before 1991, the General Sales Tax) component, (2) the excise component, and (3) the industry price component. The real industry price was slowly decreasing between 1961 and the early 1990s. However, from 1992 onwards, when it became clear that the apartheid government’s days were numbered, the tobacco industry started to increase the real industry price. This process was accelerated during the middle and especially the late 1990s and continued in the new century, albeit at a slightly lower rate. The increase in the industry price increased the retail price which in turn resulted in an increase in the (specific) excise tax in the subsequent year, in order to maintain the total tax burden at 50% of the retail price.

Thus, since 1998 the quantum of the excise tax has been largely determined by the tobacco industry. Within this context, it is ironic that the industry is complaining about the high rates of illicit trade in South Africa, and the allegation that illicit trade is caused by high excise taxes and high prices. It was
within the industry’s power to not increase the real industry price (and, by implication, the retail price and the excise tax), but presumably it was in their commercial interests to follow the pricing strategy that they have followed over the past nearly 20 years.

Figure 1: Real price and aggregate consumption of cigarettes, South Africa

Figure 2: Decomposition of the retail price of cigarettes into industry price and tax components
Reverting back to Figure 1, aggregate cigarette consumption dropped by more than 30% between 1994 and 2004. The consumption data refer to tax-paid (i.e. legal) consumption. It is very difficult to establish the true magnitude of the illicit market because industry estimates change sharply over time, casting doubt on their credibility. There seems to be agreement amongst most parties (i.e. both the industry and researchers with a public health focus) that illicit trade before the early years of the 21st century was largely non-existent. Even in the early 2000s it was low. This is confirmed by a recent presentation by British American Tobacco to the Treasury, in which they showed that in 2008 (the starting year of their analysis) the illicit market comprised less than 8% of the total market.

The rapid decrease in aggregate cigarette consumption is confirmed by the fact that smoking prevalence amongst adults dropped from 31% to 24% over the same period. Also, smoking intensity (i.e. the number of cigarettes smoked per day by remaining smokers) have dropped substantially.

Time series studies that have estimated the demand for cigarettes have found, unsurprisingly, that cigarette consumption is greatly influenced by the (real) price of cigarettes. The price elasticity estimates have clustered around -0.6, in line with findings from other low- and middle-income countries.

The demand for cigarettes is positively influenced by income. Income elasticity of demand estimates have clustered around +0.6. To illustrate the impact of changes in income on the demand for cigarettes, consider the period 2004 to 2008. Despite continued increases in the price of cigarettes and a hostile legislative and social environment towards smoking, aggregate (legal) cigarette consumption grew because of the rapid economic growth (5-6%) experienced by South Africa in those years.

The sharp decrease in legal cigarette consumption in 2010 is not explained by either changes in cigarette prices or changes in income, and is the result of a sharp increase in illicit trade in that year. This experience clearly shows that illicit trade is a concern and should be taken seriously by revenue authorities and law enforcement agencies in the country. However, there has been a partial turnaround in 2012. In fiscal year 2012/13 legal cigarette consumption increased by 6.3%. Given the

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8 Economics of Tobacco Control in South Africa Project (ETCSA) (Phase II), 2003. The tobacco epidemic can be reversed: Tobacco control in South Africa during the 1990s. Cape Town: Applied Fiscal Research Centre
anaemic economic growth in 2012, this would only be possible if there had been a substantial decrease in the illicit market.

Other than the obvious public health benefits, an increase in the excise tax on tobacco has positive fiscal consequences. Figure 3 illustrates the relationship between the real excise tax per pack of cigarettes and total excise tax revenue. The rapid erosion of the real excise tax in the late 1970s and early 1980s is the result of rapid inflation and a government unwilling to adjust the nominal excise tax in line with the inflation rate.

The real excise tax has increased by 550% from its lowest point in the early 1990s to 2012, and real excise revenue has increased by nearly 300% over the same period. Despite the industry’s allegations of large increases in illicit trade, the strong positive relationship between the excise tax per pack and total excise tax revenue is clearly illustrated.

Figure 3: Real excise tax per pack and real excise tax revenue, South Africa

These two diagrams provide a convincing historical picture of the relationships between cigarette prices and cigarette consumption, and between excise tax per pack and total excise tax revenues. The simulation model, discussed below, is a forward looking planning tool that officials in the Ministry of Finance can use to support tobacco control efforts and the budgeting process. The simulation model is based on the relationships that have been graphically presented above.

THE SIMULATION MODEL

The aim of the simulation model is to allow users to estimate changes in cigarette consumption and government revenue as a result of a change in the excise tax and/or the proposed levy on cigarettes.
The model is completely user driven, and requires very few inputs. The inputs required, with the current default values shown in parentheses, are the following:

1. **Base values:**
   - Retail price of cigarettes, per pack (N$ 30.00)
   - VAT rate (15%)
   - Excise tax, per pack (N$ 10.92)
   - Legal cigarette consumption at the outset, packs (17.5 million)
   - Illicit market share at the outset, percentage of the total market (10%)

2. **Parameter estimates:**
   - Price elasticity of demand (-0.6)
   - Income elasticity of demand (0.6)

3. **Changes in the policy and conditioning variables**
   - Increase in the excise tax, percentage (0%)
   - Increase in the proposed levy, N$ per pack (N$ 4.00)
   - Increase in the net-of-tax price, percentage (10%)
   - Increase in real GDP, percentage (4.5%)
   - Increase in illicit market share as a result of the increase in the tax/levy, percentage of the total market (2%)

Base values at the outset (point 1) were discussed with participants at the workshop, and there was consensus that these broadly reflect the reality of Namibia. The parameter estimates (point 2) were derived from South African studies that have investigated the demand for tobacco, and are also consistent with elasticity estimates from other low- and middle-income countries. The policy and conditioning variables (point 3) are arbitrarily determined by the user, although some of them (e.g. the increase in the net-of-tax price and GDP growth) have historical precedents. All of these inputs can be changed by the user. In fact the model allows one to do various “what if?” type simulations, where the user can change one or more of the model inputs and see how this affects the output variables.

The output is provided in various formats (e.g. levels and percentage changes). The most important output variables are the following:

- Total cigarette consumption, broken down into legal and illicit consumption
- Total excise tax revenue (payable to the SACU common revenue pool)
- Total revenue from the levy
- Total VAT revenue
- Retail price, and its components, per pack (VAT amount, excise tax, levy and net-of-tax price)

Given the inputs above, but for two different price elasticity values (-0.6 and -0.3) and two different amounts of the levy imposed (N$ 4.00 and N$ 8.00 per pack), the most important outputs are the following:
Based on the default set of inputs, and a price elasticity of -0.6, the imposition of a N$ 4.00 levy would be expected to increase the retail price from N$ 30.00 to N$ 36.34, decrease legal consumption from 17.5 million packs to 15.7 million packs, increase illicit consumption from 1.9 million packs to 2.1 million packs, and, crucially, raise N$ 62.6 million in revenue (scenario 1). If the levy were to be imposed at N$ 8.00 per pack, the retail price would increase by a greater amount, consumption would drop by a greater amount, and more revenue would be raised (scenario 2). This analysis assumes that the illicit market increases by 2 percentage points in both scenarios, something that may be disputed, but that can be adjusted for in the model.

The table also illustrates the impact of a different price elasticity assumption in scenarios 3 and 4. Should the price elasticity be -0.3, rather than -0.6 (i.e. less price elastic than previously), a N$ 4.00 levy would still result in the same price change as previously (scenario 1), but cigarette consumption would be expected to decrease by a smaller quantity than had the price elasticity been -0.6. However, a lower price elasticity results in a larger revenue increase for a given increase in the levy.

What this simulation exercise shows is that the imposition of the levy has positive public health and fiscal consequences: there is a reduction in total cigarette consumption and an increase in tax revenues. What the exercise also shows is that, if demand for cigarettes is more price elastic, the public health benefit will be somewhat larger, and if the demand is less price elastic, the fiscal benefit will be somewhat larger. Nevertheless, and crucially, both the public health and the fiscal aims are positively served in an absolute sense through the imposition of such a levy.

The full output for the base scenario and scenarios 1 and 3 are shown in the Appendix.

Regarding some of the technicalities of the model, the following:

The model is programmed in Excel and is freely available to be used by officials in the Ministry of Finance. It may be freely distributed. Users need to populate the cells in the blue blocks. All other cells are formula driven and derive the outputs from the user inputs.

The model starts from the premise that the retail price of a pack of cigarettes can be broken down into four components: (1) VAT, currently levied at 15% on the sum of the industry price and the various tax components (which converts to 13.04% of the VAT-inclusive price), (2) excise tax (currently N$ 10.92), (3) proposed levy (currently N$ 0.00), and (4) industry (or net-of-tax) price (which is calculated as the retail price less the three tax components mentioned above). At a retail price of N$ 30.00, the net-of-tax price is N$ 15.17.

The imposition of the levy would typically result in an increase in the retail price (unless the cigarette manufacturers decrease the industry price, something that has no recent historical precedent). The
model allows one to change the excise tax (this would be a decision taken at the SACU level) and to change the net-of-tax price. Experience from SA and Namibia has shown that the tobacco industry has often used the increase in the excise tax to increase the net-of-tax price, resulting in a larger increase in the retail price than is justified by the increase in the excise tax alone.

The focus of this model is primarily on the impact of a Namibian-specific levy on cigarette, over and above the excise tax. It is assumed that the levy would be levied as a specific tax, like the excise tax.

When the retail price increases, cigarette consumption decreases. The quantum of the decrease in consumption is determined by the price elasticity of demand. As discussed previously, estimates of the price elasticity of demand in South Africa are clustered around -0.6, which is also the default value proposed for Namibia. However, the user can change this value.

The model incorporates the impact of economic growth on cigarette consumption. The default value for the income elasticity of demand is +0.6, but, as with the price elasticity, this value can be changed by the user.

The impact of changes in the retail price and changes in income on cigarette consumption is programmed using the mid-point (or arc) formulation of the respective elasticity concepts, rather than the point formulation. The reason is that the mid-point formula can handle large changes in price much better than the point formulation.

The model takes cognizance of the fact that there is illicit trade at the outset and that the imposition of the additional levy (or an increase in the excise tax) may change the relative magnitude of the illicit market. By its nature, it is very difficult to obtain precise estimates on the size of the illicit market. Experience from South Africa and internationally indicates that the tobacco industry’s estimates of the illicit market is usually larger than estimates by researchers that are not linked to the tobacco industry. In a report in *The Villager* of 3 February 2013, the tobacco industry stated that the illicit market comprised 10% of the total cigarette market. This estimate is likely to be on the high side, but nevertheless it is used as the default value in the model. It is very difficult to predict by how much the illicit market is going to change, since this depends on a multitude of factors (e.g. enforcement, penalties, etc.). Users are encouraged to simulate the model with different changes in the illicit market to see how much extra illicit trade could be tolerated.

A crucial input in the model is current cigarette consumption. The size of the cigarette market determines the revenue potential of the proposed levy. Two newspaper reports, provided by the delegates at the workshop, quote broadly believable numbers. According to *The Namibian* of 16 November 2011, BAT sold 330 million cigarettes annually, and had 85% of the legal market share. This translates to a total legal market of 388 million cigarettes. According to *The Villager* of 3 February 2013 the total market was 350 million cigarettes, of which 10% were illicit, implying a legal market of 315 million cigarettes. Taking a rough average of these estimates, we work on 350 million legal cigarettes, or 17.5 million packs. It is hoped that the Ministry of Finance or another government agency can provide more precise consumption numbers.

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Three types of tax revenue are identified in the model: (1) excise revenue (which flows to the SACU Common Revenue Pool and where Namibia receives a modest share, based on the revenue sharing formula), (2) revenue from the proposed levy, which is wholly received by Namibia, and (3) VAT revenue, which is also wholly received by Namibia. The revenue from each of these three sources is the product of legal consumption and the tax per pack. The revenue is calculated for the base scenario, and for the scenarios which take account of the changes in the tax and/or price.

THE WAY FORWARD

It is envisaged that a task team be established from officials in the Department of Customs and Excise to refine some of the data used in the simulation model, and to help drive the process forward. Regarding the data, we propose the following:

1. Current cigarette consumption is estimated at 350 million sticks (17.5 million packs), based on newspaper reports. Newspaper reports are not necessarily good sources of data. To obtain better consumption numbers, it would be useful to get government data.
2. Furthermore, although not vital, the model would be enhanced if there are consumption data, or at least market segment percentages, for different price categories, e.g. premium, MPPC and discount brands.
3. Even though the focus is primarily on cigarettes (because cigarettes comprise about 95% of total tobacco use), a similar levy should be charged on other tobacco products, especially pipe tobacco and cigars. To estimate the public health and fiscal consequences of placing a levy on other tobacco products, the task team would have to find consumption data on these other forms of tobacco.

Nine people present at the workshop have indicated their willingness to be part of the task team. They are:

1. Lucia Taonara (Chief Customs and Excise)
2. Rauha Zimba (Excise officer)
3. Samuel Thimende (Senior Customs and Excise)
4. Bronson Ijozongoro (Trade facilitation)
5. Erastus Ismael (Asywalk?)
6. Samuel Nankele (Excise policy)
7. Isidor Kanyangela (Senior Customs and Excise coordinator)
8. Martha Amukoto (Chief excise operation)
9. Martha van Wyk (Senior Customs and Excise officer: excise policy)

The simulation is a purely technical exercise. Many issues would need to be addressed if the Government of Namibia wishes to implement the envisaged additional tobacco levy. These are both technical and political issues. Some of these include the following:

- The political process to get the concept of such an additional levy on tobacco products accepted by government.
- The levy has legal standing under the Tobacco Control Act of 2010, but the practical procedures required to put such a system in place would need to be carefully put in place.
• Where and how the additional levy will be imposed, e.g. at the borders, or at the manufacturing plant in South Africa?
• Determining the quantum of the levy, and how the levy will be structured, e.g. as an absolute amount or as a percentage of either the existing excise tax or the price?

IN CONCLUSION

We want to thank the Government of Namibia and the Department of Finance in particular for allowing us to be part of this consultation. We trust that the workshop will reap fruit in the form of the imposition of the levy that will result in less cigarette smoking (and the associated burden of disease and death), and higher tax revenue.

We would be very happy to help in any area of our competence in future should the need arise.
## APPENDIX

### SIMULATION EXERCISE FOR NAMIBIA

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<thead>
<tr>
<th>Initial position</th>
<th>Units</th>
<th>Base</th>
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<tr>
<td>1 Retail price (N$ per pack)</td>
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<td>2 VAT rate</td>
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<td>3 Excise tax (N$ per pack)</td>
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<td>Namibian-specific levy (N$ per pack)</td>
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<td>4 Legal cigarette consumption</td>
<td>Million packs</td>
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<tr>
<td>5 Illicit market share</td>
<td>Percentage of total market</td>
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### Parameters

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<tr>
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<tr>
<td>7 Price elasticity of demand</td>
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<td>8 Income elasticity of demand</td>
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### Changes in important variables

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<td>9 Increase in excise tax</td>
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<td>10 Increase in levy</td>
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<td>11 Increase in net-of-tax price</td>
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<td>12 Increase in GDP (income)</td>
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<td>13 Increase in illicit trade</td>
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### Outputs

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<td>15 Total legal cigarette consumption</td>
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<td>15.66</td>
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<td>16 Total illicit cigarette consumption</td>
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<td>17 Total excise tax revenue (to SACU)</td>
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<td>170.97</td>
<td>181.09</td>
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<td>18 Total levy revenue</td>
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<td>19 Total VAT revenue</td>
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### Per pack numbers

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<tr>
<td>24 Levy</td>
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<td>Percentage changes</td>
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<tr>
<td>Total cigarette consumption</td>
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<td>Total legal cigarette consumption</td>
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<td>Total illicit cigarette consumption</td>
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<td>Total excise tax revenue (to SACU)</td>
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<td>Total levy revenue</td>
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<tr>
<td>Total VAT revenue</td>
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<td>Total industry revenue (legal cigarettes only)</td>
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<td>Total expenditure (legal cigarettes only)</td>
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