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Cigarettes taxes and smuggling in South Africa: Causes and Consequences

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ABSTRACT

The main instrument within the broader framework of tobacco control in South Africa has been the more aggressive use of tobacco taxes which since 1999/2000 have increased from 0.12 cents per cigarette to 0.38c in 2009/10. The primary goal of these policies is to reduce cigarette consumption and the attendant negative externality. National Treasury (NT) data seem to suggest that these initiatives and higher taxes in particular have been effective in reducing cigarette consumption. However, the official (NT) data pay little attention to the illegal cigarette market which in South Africa has long been assumed to be only a fraction of total cigarette consumption.

Comparing an independent consumption survey with the NT data we find that the level of cigarette smuggling in South Africa is in fact significant, constituting between 40% and 50% of the total market, and that cigarette tax hikes have to a large extent contributed to its continued existence and growth by creating a financial incentive to smuggle. Furthermore, the well-established informal sector in South Africa - which developed under Apartheid rule and is characterised by strong networks with other African countries - implies that there is a greater ability and likelihood of consumers switching from consuming legal cigarettes to consuming illegal cigarettes following a tax-induced price increase. There is also much evidence indicating that illegal cigarettes are of inferior quality which, combined with the tax induced shift to smuggled cigarettes, suggests that cigarette tax hikes could have the perverse effect of raising rather than lowering the overall negative externality.

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1. Introduction

Historical accounts of the use of sin taxes[3] indicate that they have been around for hundreds of years in many forms and levied on a range of goods. There are even accounts of taxes levied on legal prostitutes by Pope Leo X and a tax on beards levied by Peter the Great (Times Magazine, April 2009). However, the main motivation during those times was to raise income to finance the lavish lifestyles of the authorities. Since then, sin taxes have grown in popularity. South Africa is no exception and has over the past several years dramatically increased taxes levied on "sin" goods such as tobacco and alcohol. The aim of these taxes has primarily been to address issues arising from the negative externalities, and current literature seems to be toasting its success in this regard.

The focus of this paper is mainly on tobacco taxes as part of a broader tobacco control policy framework, as much of the alleged success of South Africa's tobacco control policy has been attributed to the prominent role played by increased tobacco taxes. However, this paper looks at the extent to which tobacco consumption has actually been reduced considering both the legal and illegal market. It reveals that despite the reduction in the consumption of *legal* cigarettes a substantial illegal market for cigarettes exists in South Africa and that tax increases serve as an incentive for this market to continue thriving due to the enabling environment created by cigarette price differentials. Furthermore, the informal networks that arose during Apartheid have facilitated cross-border cigarette smuggling, making it much easier to conduct in South Africa than in other countries. The focus of this paper is on cigarette tobacco, which represents roughly 95% of tobacco consumption in South Africa (Datamonitor, 2010).

2. Rationale for Cigarette Taxes

According to the World Bank (1999), smoking kills one in 10 adults worldwide and by 2030 one in six deaths each year will be smoking related. Using the South African death notification system, Sitras et. al. (2004) calculate that 8% of all adult deaths in South Africa were caused by smoking, which translates to approximately 20 000 deaths per year. In addition, 58% of lung cancer deaths, 37% of COPD[4] deaths, 20% of tuberculosis deaths and 23% of vascular deaths could have been avoided in the absence of tobacco smoking.

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[3] Cigarette taxes are considered to be sin taxes as they are generally considered to be harmful or morally undesirable to consume.

[4] Chronic obstructive coronary disease

From a theoretical perspective, the primary reasons for implementing taxes on cigarettes are essentially twofold (Abedian and Jacobs, 2001):

- Reducing consumption and internalizing the negative externality

- Increasing government revenue

The rationale for government intervention stems from the role governments have to play in correcting market failures in the economy. In the case of tobacco, the main market failures are the presence of health-related externalities, as well as a lack of information regarding the health implications of tobacco consumption (Ross and Chaluopka, 2006). Smokers may impose an external cost by discomforting other non-smoking persons in their immediate vicinity, but these effects are generally considered to be rather small (Gruber and Koszegi, 2008). By far the largest externalities include increased health[5] and insurance costs and lower workplace productivity (Viscusi, 2003 and Gruber and Koszegi, 2008). Theory suggests that an efficient level of consumption would ensure that the price of cigarettes is such that it takes into consideration the harm inflicted by smoking on society as well as on the individual's own welfare (Viscusi, 2003 and World Bank, 1999). Therefore, the tax should be set at a level at which all of the external costs of cigarette consumption are ideally fully compensated for. In other words, the cigarette tax acts as a Pigouvian tax and attempts to have smokers internalize the external costs imposed by their smoking[6] (Viscusi, 1995). An additional externality may be an increase in criminal activity as many cigarette smugglers use the profits derived from their illegal trade in tobacco to fund some of their other criminal activities.

However, the reduction in consumption does not completely eliminate the negative externality. There is still an externality caused by the remaining cigarettes consumed. This, in theory, is "compensated" for by the tax revenue received by the state. Since 1995, the South African government renevue derived from cigarette taxes increased from an estimated R1.5 billion to just under R9 billion in 2008/09, thus suggesting that the value of the negative externality has steadily increased, or at least that the authorities have increasingly relied on the tax option over this period. Also from a revenue perspective, increased taxes on cigarettes are considered to be relatively efficient as the demand for cigarettes tends to be relatively inelastic. According to Frank Ramsey (1927), taxes should be higher on goods for which

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[5] According to Ross and Chaloupka (2006), the annual cost of healthcare as a result of tobacco use is estimated to be between 6 and 15% of total expenditure on healthcare in developed countries.

[6] In South Africa the estimated external cost of smoking was R1.4 billion in 1988 (Yach, McIntyre and Saloojee, 1992).

demand is relatively inelastic and lower on goods and services for which demand elasticity is relatively high. The continued increase in government revenue despite increasing sin taxes is the result of consumers' relatively low willingness to change their current consumption patterns. In South Africa, a number of studies on the elasticity of cigarette consumption has been concluded, as shown in Table 1. The most recent by Boshoff (2008) found that the price elasticity of demand for cigarettes lies somewhere within the range of -0.5 to -0.7. Boshoff also aknowledges that the lack of data regarding the illicit cigarette market would likely result in an upward bias of current estimates (Boshoff, 2008).

Table 1: Price elasticity estimates for cigarettes in South Africa

Author	Price elasticity	Sample period
Reekie (1994)	-0.87	1970 - 1989
van Walbeek (1996)	-0.53 to -1.52	1970 - 1990
van der Merwe and Annett (1998)	-0.69	1970 - 1995
van Walbeek (2000)	-0.6	1970 - 1998
Boshoff (2006)	-0.5 to -0.7	Various

Source: Boshoff, 2008

However, it is the very nature of cigarette demand elasticity (or its relative inelasticity) that limits the reduction in cigarette consumption (and therefore also the reduction in the negative externality) following a tax-induced price increase. In fact, the reduction in consumption is likely to be relatively small in comparison to the extent of the price increase. Therefore, other measures or programmes are required to reduce cigarette consumption. Black et. al. (2005) note that regulation and restricted property rights in respect of smoking are other interventions which could possibly assist in reducing the negative externality. The South African authorities have indeed focused on the regulation component of intervention. These regulations include limiting the extent of exposure to second-hand smoking by banning smoking in public and work places, banning cigarette advertising, and increasing the percentage of the product package dedicated to health warnings and labels. Further regulatory interventions are related to the maximum permissible tar and nicotine content of cigarettes[7] (which directly affects the extent of the negative externality).

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[7] In 2001, the tar yield of cigarettes was set at a maximum of 15 mg per cigarette and the nicotine yield was set at a maximum of 1.5 mg per cigarette. In 2006 this threshold was lowered to a maximum of 12 mg of tar yield and 1.2 mg of nicotine yield per cigarette.

Additional comments by Black and Mohammed (2006) point to a previously over-looked caveat of tobacco taxes[8], i.e. that existing data often do not take into account the intra-household distributional effects of increased tobacco taxes. Importantly, existing data also fail to capture the possible substitution of lower quality tobacco products for higher quality products in response to an increase in cigarette taxes. Both these complications can erode the effectiveness of sin taxes as a measure of reducing the negative externality of cigarette consumption and in extreme cases can aggravate the problem.

Furthermore, the evidence presented by both international and national literature regarding the impact of sin tax hikes assumes either no cigarette smuggling, or a very small and insignificant illegal market.

3. Basic Hypothesis

The existence of an illegal[9] cigarette market in South Africa has long been argued to be only a fraction of total cigarette consumption and which therefore does not erode the effectiveness of government-induced price increases (sin taxes). However, evidence presented in this paper suggests that the level of cigarette smuggling in South Africa is indeed significant and that cigarette taxes have to a large extent contributed to its continued existence. This has important consequences for government intervention in the tobacco industry. Our basic hypothesis is straightforward and can be best explained by first referring to the conventional wisdom on the issue.

We start by imagining an original tax-free scenario, shown in Figure 1 by the total (recorded) demand curve, D, and the tax-exclusive supply or marginal private cost curve labelled MPC. At the original equilibrium point C, where $0Q_4$ cigarettes are consumed at a unit price of 0E, the value of the externality is given by the area EABC or CB per unit, as defined by the difference between marginal social cost (MSC) and MPC. Conventionally, a Pigouvian tax equal to CB (= GF) would move the equilibrium to point F where the externality has been reduced to the area EAFG. The fact that government revenue also equals EAFG implies that it does theoretically provide compensation for the (remaining) externality. But the story is not that simple, and we argue that tax hikes may over time split the market into a so-called unrecorded (illegal) market, consisting mostly of smuggled and cheaper tobacco products (Q_u), and a recorded (or official / legal) market for tobacco (Q_r); with the demand curves

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[8] The study by Black and Mohammed (2006) also looks at alcohol taxes.

[9] In this paper the words, illegal, illicit, contraband and unrecorded will all refer to the smuggled cigarettes.

given by D_U and D_R respectively in Figure 1. The shift to smuggled tobacco occurs mostly among the poor (and addicted) segment of the market, as shown by the difference in price elasticity between the recorded and unrecorded markets.

Figure 1: Recorded and unrecorded cigarette market
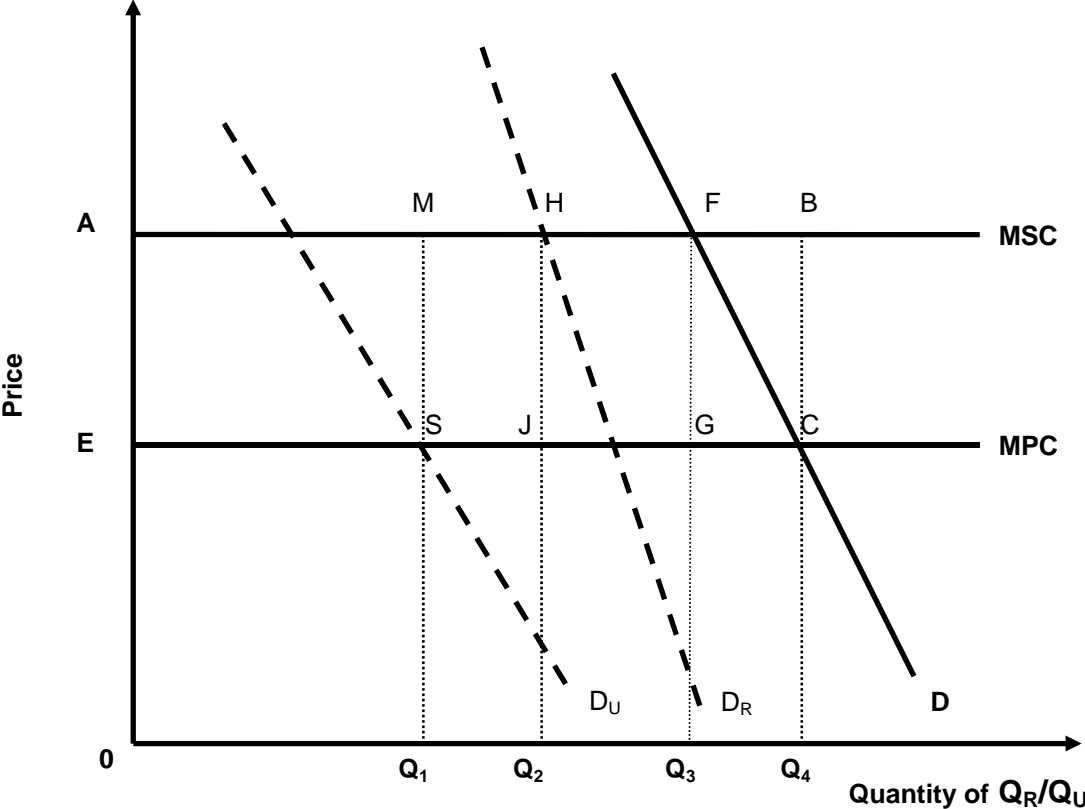
Under the smuggling scenario in Figure 1 the recorded market achieves equilibrium at point H, consuming $0Q_2$ units of (legal) tobacco at the tax-inclusive price of 0A. The unrecorded market pays no tax and reaches equilibrium at point S, consuming $0Q_1$ units at the tax-*exclusive* price of 0E. Government revenue of AHJE is fully paid for by the recorded market. Although the post-tax quantity ($0Q_2 + 0Q_1$ or EJ (=AH) + ES) is smaller than the pre-tax quantity at point C, the impact on the size of the externality is evidently much different from before: pre-tax it is the area EABC and post-tax it is the sum of areas EAHJ and EAMS. The effect of tax-induced tobacco smuggling is therefore twofold: it reduces government revenue below the level applicable to a smuggle-free scenario (i.e. from EAFG to EAHJ in Figure 1) and has an evidently negligible if not perverse impact on the size of the negative externality.

Yet another unforeseen effect is the fact that illegal cigarettes may not subscribe to the minimum standards in terms of content (of harmful substances) as prescribed by regulation (especially if these cigarettes are produced in countries with less strict requirements). As such, these "lower" quality cigarettes could in fact raise rather than lower the size of the negative externality. Figure 2 below depicts the market for cigarettes with, as before, total demand comprising both illegal and legal cigarettes. In our analysis in Figure 1 we assumed that the externalities per unit produced by these products were identical. However, should the illegal cigarettes be of a lower quality (eg. causing a higher incidence of tobacco related disease and deaths) then the resultant negative externality per unit consumed would be higher than for legal cigarettes. In other words, the marginal social cost of consuming illegal cigarettes will be higher. This is depicted by MSC_U in Figure 2. The total after-tax externality in the case of inferior-quality illegal cigarettes is raised by area AXYM. Therefore, the total externality (post-tax) could in fact be higher than the pre-tax externality.

Figure 2: With lower quality smuggled cigarettes
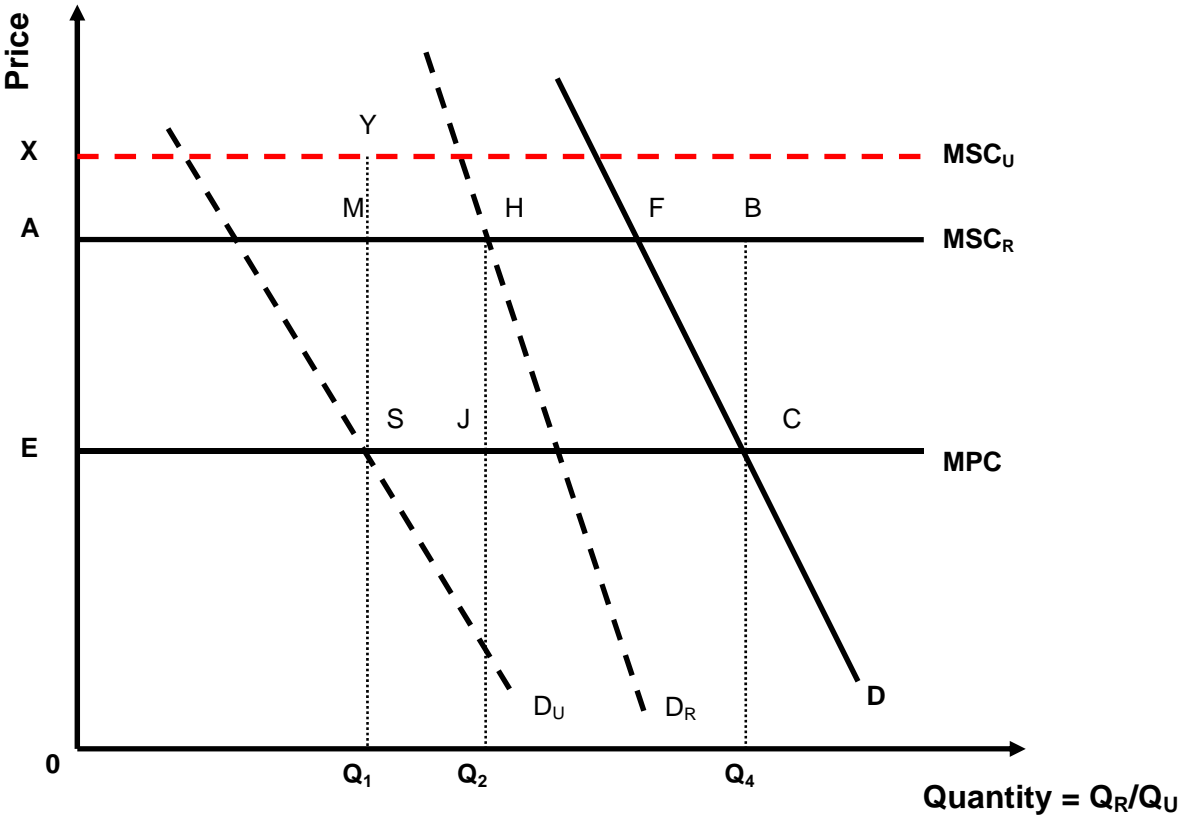
4. Measuring Cigarette Smuggling

The methodology used in this section is based on one suggested by the World Bank[10] and for which South Africa has relatively complete information. In essence, legal tobacco sales based on excise tax revenue estimates released by the National Treasury (NT) will be compared to cigarette consumption as measured by an independent consumption survey - in this case the AMPS (All Media and Products Survey) database. The discrepancy between the two (if any) is assumed to equal the level of smuggling.

The AMPS data are based on information pertaining to the number of cigarettes smoked the day before the survey, to which respondents would indicate the number of cigarettes consumed within various bands, heavy[11], medium[12], and low[13]. The number of individuals in each category is then multiplied by the midpoint of the category to obtain the approximate number of cigarettes consumed the previous day. This figure is multiplied by 365 to get annual data, which are then comparable to the data made available by the NT. Crucial to the validity of estimates according to Merriman (2003) and Wasserman et. al. (1991) is that allowance be made for under-reporting of cigarette consumption due to the social stigma associated with smoking.

However, in the case of the AMPS data it is difficult to discern whether or not "heavy" smokers are more likely to under-report than "light" smokers. Blecher (2010) also highlights similar constraints to the data.

According to AMPS data the total number of cigarettes consumed in South Africa averaged approximately 46 billion sticks between 2001 and 2008. There were some variations of course with cigarette consumption peaking in 2004 at approximately 47 billions sticks before declining to just above 45 billion in 2006 (see Figure 3).

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[10] In his paper Merriman (2002) also suggests other methods of calculating the level of tobacco smuggling. However, this method was chosen as there are sufficiently reliable data available.

[11] Smokers that indicated they smoked between 11 and 99 cigarettes the day before

[12] Smokers that indicated they smoked between 6 and 10 cigarettes the day before

[13] Smokers that indicated they smoked between 1 and 5 cigarettes the day before
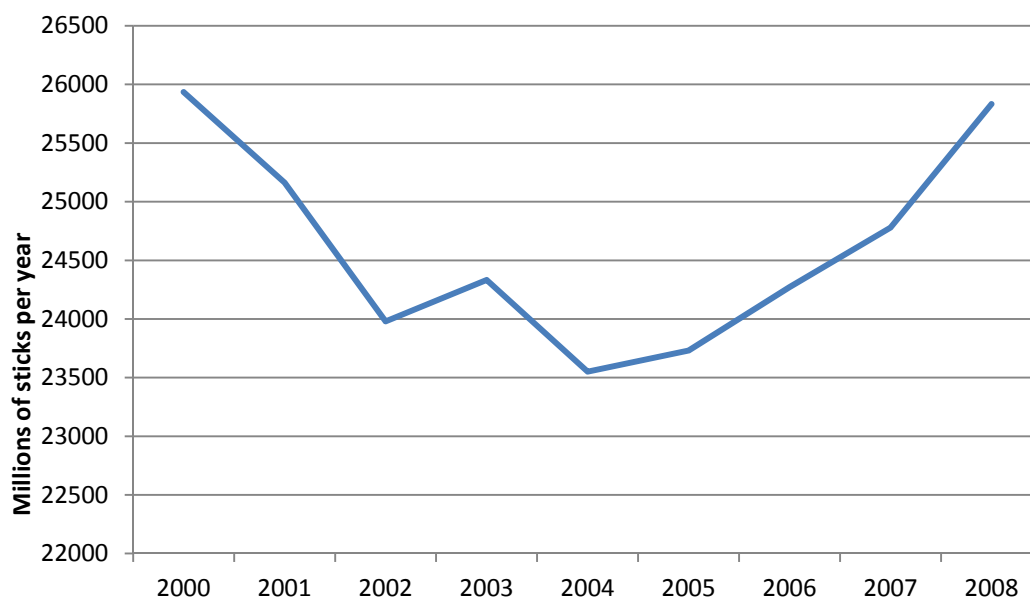
Figure 3: Total cigarette consumption
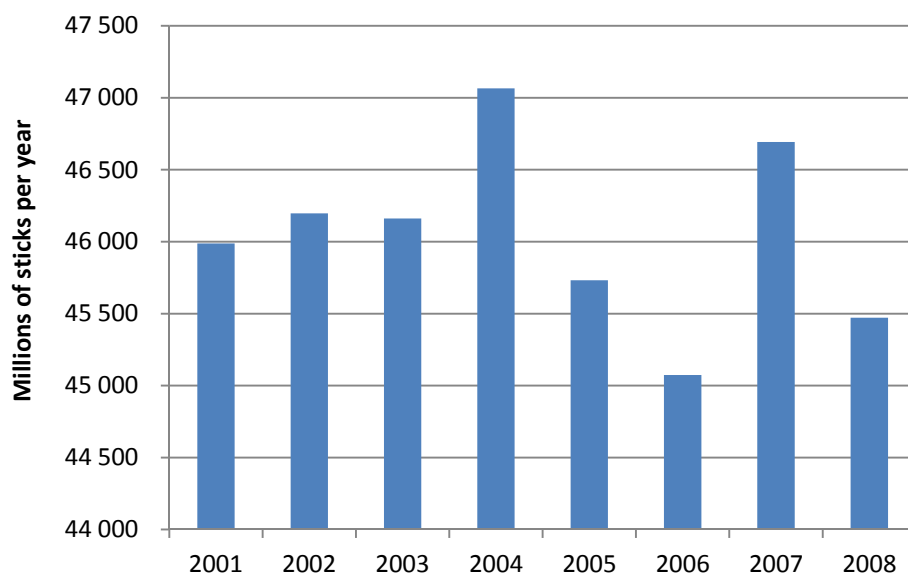
Source: Own estimates from various AMPS surveys

The NT data are used to generate the official estimates of cigarette consumption in the country. The estimates for cigarette tax revenue are extracted from the annual income and expenditure data, and are then divided by the relevant per cigarettes tax for that financial year. This data are then re-calculated so as to be comparable with the AMPS dataset, i.e. in calender year terms. This is illustrated in Figure 4. Interestingly, the level of "legal" cigarette consumption started to increase in 2005 following a consistent decline in "official" consumption levels until then. This could be as a result of the pricing mechanism used within the South African tobacco industry which has shifted from being focused towards price increases (for revenue purposes) to trying to maintain the current market via *lower* price increases (van Walbeek, 2006).

Figure 4: Legal cigarette/taxpaying market

The results for cigarette consumption using NT data (illustrated in Figure 4) show that the official number of cigarttes consumed averaged 24.5 billion sticks per year between 2011 and 2008. The data from the NT show a rise in cigarette consumption to approximately 25.8 billion sticks in 2008, from a low of around 23.3 billion sticks in 2003.

In order to calculate the level of cigarette smuggling for any given year, the following formula is used:

$$Q_S = Q_A - Q_{NT}$$

The level of cigarette smuggling (Q_S) is the difference between the consumption as revealed by the AMPS data[14] (Q_A), and the "official" cigarette consumption level as determined by the National Treasury (Q_{NT}). Using the above equation, and considering Figures 5 and 6, it is evident that there is a significant descrepancy between estimated cigarette consumption as derived from the AMPS (recorded and unrecorded market) and that of the NT (recorded market). In fact, bwteen 2001 and 2008 the average annual number of illegal cigarettes consumed was approximately 21.6 billion sticks.
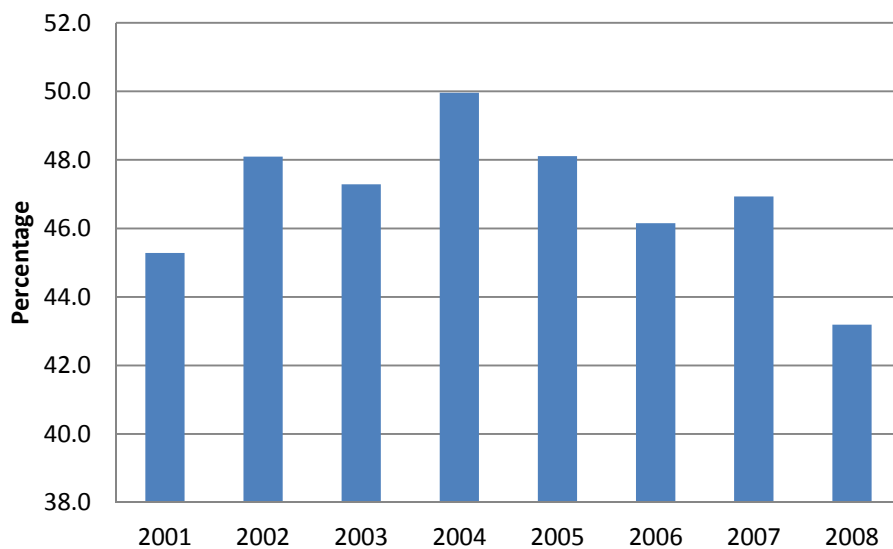
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[14] This is also considered to be the level of overall cigarette consumption in South Africa.

Figure 5: Total cigarette consumption versus legal cigarette consumption
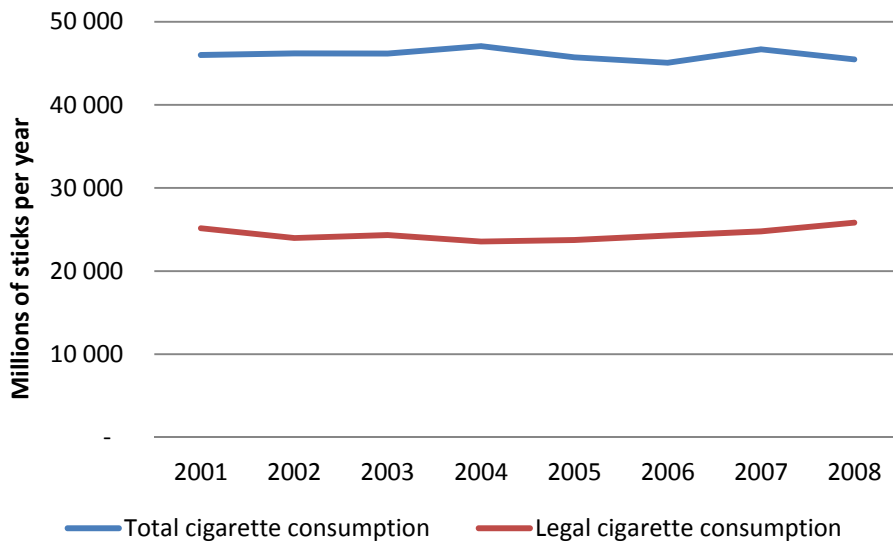
Figure 6: Illegal cigarettes as % of total market

Comparing the official national treasury data with the AMPS data reveals three important conclusions:

(i) Current estimates regarding the level of cigarette smuggling are grossly inaccurate. The level of cigarette smuggling between 2001 and 2008 was in the range of 40 to 50 per cent of total cigarettes consumed in South Africa, as shown in Figure 6.

(ii) The popular assumption that cigarette smuggling was relatively small, even non-existent prior to 1997, can be contested as the discrepancy between the AMPS data and the data derived from the National Treasury already appears substantial in 1997 and 1998[15]. However, the data for the periods preceeding 2000 are measured differently in the AMPS, so we had no choice but to focus mainly on the 2001 – 2008 period.

(iii) The decline in cigarette consumption does not tie in with the increases in cigarette taxes, which were implemented gradually and across a longer timeframe than the timeframe for which the reduction in cigarette consumption was actually experienced, which was between 2000 and 2001. This implies that part of the reduction in cigarette consumption, could have been the result of regulation, specifically the Tobacco Control Ammendment Act of 1999[16], which was implemented in 2000[17] and a rise in under-reporting[18]. Althought this paper does not attempt to formally model the impact of the Tobacco Control Ammendment Act on cigarette consumption, there is evidence from the literature that supports the claim that reduced cigarette consumption can be achieved via bans on advertising, warning labels and restictions regarding smoking in public and workplaces (World Bank, 1999).

5. Potential Causes

The existing literature presents a number of conditions required which could result in cigarette smuggling developing and thriving. The most prominent of these is that price differentials across countries create a financial incentive to smuggle. More recently, studies have revealed that the level of corruption is also a determinant of the level of tobacco smuggling. However, in order to substantiate claims of the existence of an illegal market for cigarettes in South Africa, it needs to be understood to what extent these conditions are relevant to South Africa. In addition, the evidence above suggests that cigarette smuggling has been a feature of South African tobacco consumption even before the shift in tobacco control policy towards higher excise taxes.

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[15] The tobacco industry claims that cigarette taxes (or at least, the rise in cigarette taxes) are to blame for the rising levels of cigarette smuggling in South Africa, and that the illegal market for cigarettes was largely non-existent before 1994.

[16] Saffer and Chaluopka (1999) found that regulations which result in the comprehensive banning of tobacco advertising can reduce tobacco consumption. However, the reduction in consumption levels during the sample period used by Saffer and Chaloupka revealed a modest reduction of only 6.9% attributable to the implementation bans on tobacco advertising.

[17] The Tobacco Control Amendment Act of 1999 only came into operation on 1 October 2000, after the AMPS survey was conducted. This explains why the reductions due to the act are experienced between 2000 and 2001 and not earlier.

[18] As a result of increased emphasis on cigarettes being an undersirable product.

5.1 Price differentials

Many studies analyzing the relationship between tobacco taxes and consumption seem to confirm that increased tobacco taxes result in a reduction in (recorded) tobacco consumption (Loosens et. al.). However, increases in cigarette taxes inevitably increase the cost of cigarettes. One of the main reasons for smuggling, although not the only one, is the difference in price across borders as a result of increased taxation (Saba et. al. 1995). Using data from the US, Goel (2008) found that price factors were indeed the main force behind smuggling between states in the US.

Excise tax-induced cigarette smuggling is one of the main arguments postulated by the legal tobacco industry against increased tobacco taxes in South Africa (Blecher, 2010). Indeed, the continued increases in cigarette prices have resulted in South Africa having one of the highest cigarette prices in the world. In 2007, South Africa ranked 42 out of 163 countries in terms of the highest cigarette prices[19] (in dollar terms). According to the study, the comparative cost of a pack of cigarettes in South Africa is $2.69. This is significantly less expensive than Norway, which boasts the highest cigarette price of $11.48, but is higher than the average of $2.47 – see Figure 7. More importantly; the local price of cigarettes is much higher than that of neighbouring states and other countries which supply our illegal cigarettes[20].

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[19] This is based on a study conducted by Tobacco Atlas which calculated the cost of 1 pack of Marlboro cigarettes across a number of countries.

[20] According to a statement released by the South African Revenue Service, the majority of smuggled cigarettes seem to originate from Zimbabwe and China. This is based on data regarding customs seizure and information from previous raids.

Figure 7: International comparison of cigarette prices
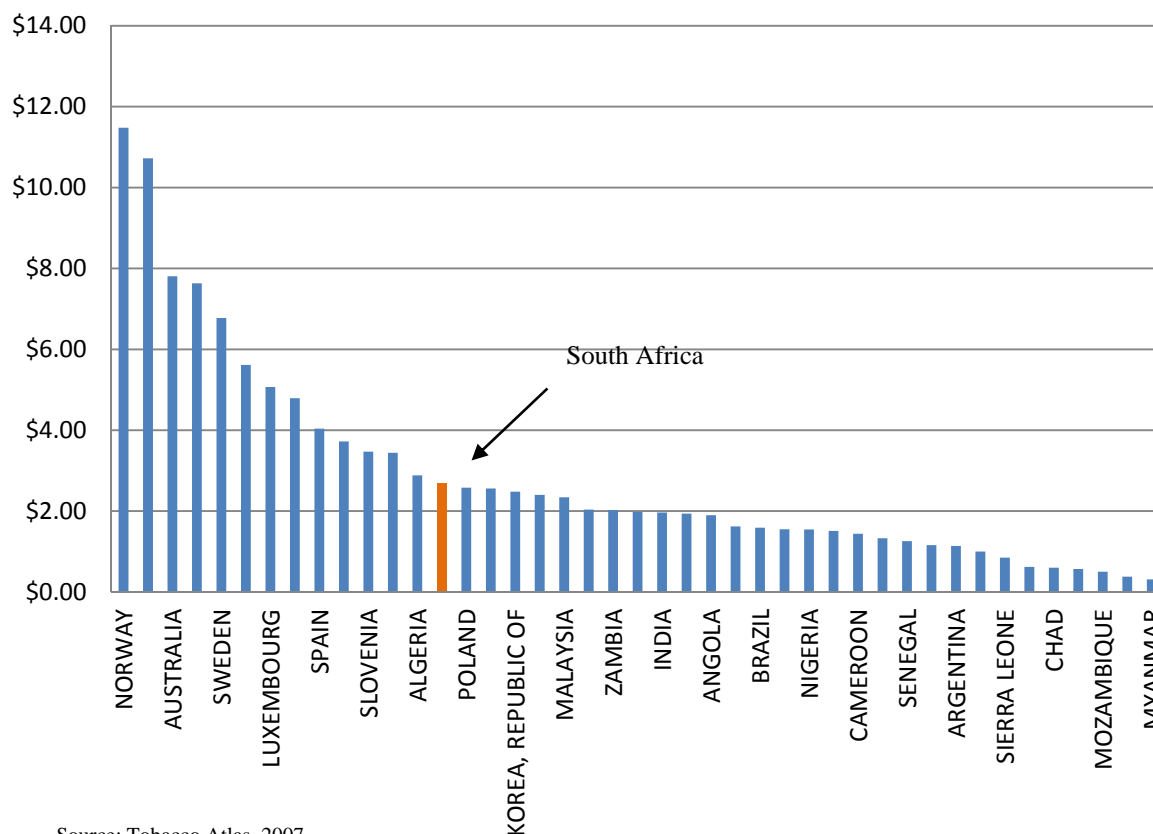
Source: Tobacco Atlas, 2007

The selling price of cigarettes in South Africa is calculated to be 32% higher than cigarette selling prices in China, 33% higher than in Zambia and a massive 438% higher than the selling price of cigarettes in Mozambique. The vast gap in cigarette selling prices in South Africa and neighbouring states compared to other sources of smuggled cigarettes shown in Table 2 provides support to the argument that a financial incentive exists for cross-border cigarette smuggling.

Table 2: Cigarette prices, SA versus illicit source states

Country	$ price of 1 pack of cigarettes	Price differential % (SA = 0)
South Africa	2.69	0
China	2.04	32
Zambia	2.02	33
India	1.97	37
Zimbabwe	1.16	132
Mozambique	0.5	438

Source: Tobacco Atlas, 2007

5.2 Level of corruption

Price differentials between countries often serve as incentive for cross-border smuggling of cigarettes. However, according to Merriman et al. (1999), the ease with which border controls can be evaded in some cases determines the level of tobacco smuggling. Merriman et. al. (1999) went further and tested the correlation between the transparency index (a measure for corruption) and opinions regarding the level of smuggling for various countries. Their study revealed that the less corrupt the government, the less cigarette smuggling is perceived to be.

South Africa was ranked 55th (out of 180) of the least corrupt countries in the world in 2008, based on estimates from Transparency International. The CPI (Corruption Perceptions Index) score indicates the perceived level of public-sector corruption in a country or territory based on the results of 13 independent surveys[21]. This survey, first conducted in 1996, has become the benchmark for determining the level of corruption that exists within the public sector around the world, and although the index's value lies in its level, it is useful to compare across countries and territories, as is done in Table 3.

Table 3: Corruption perceptions index, 2009 (Select countries)

Corruption Perceptions Index (CPI			
Rank in 2009		1997	2009
1	New Zealand	9.23	9.4
2	Denmark	9.94	9.3
3	Singapore	8.66	9.2
3	Sweden	9.35	9.2
5	Switzerland	8.61	9
6	Finland	9.48	8.9
6	Netherlands	9.03	8.9
8	Australia	8.86	8.7
8	Canada	9.1	8.7
8	Iceland	-	8.7
37	Botswana	-	5.6
55	South Africa	4.95	4.7
56	Namibia	-	4.5
79	China	2.88	3.6
99	Zambia	-	3
130	Mozambique	-	2.5
146	Zimbabwe	-	2.2

Source: Transparency International

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[21] Not all surveys are available for all countries.

The index looks specifically at public sector corruption in terms of the "ability to be bribed" (demand side). The index also gives an indication of the propensity of countries to want to bribe (the supply side). Therefore, the scores as revealed by the CPI also reveal a country's appetite to bribe. Corruption is both the propensity to receive and to offer bribes.

Judging by the above evidence, the existence of cigarette smuggling within the South African context has more to do with price increases than the perceived level of corruption as the level of cigarette smuggling in South Africa is relatively large despite a relatively neutral score on the transparency index.

5.3 Legacy of Apartheid

The smuggling data presented above reveal a side to the South African smuggling story which was previously unmentioned and in some cases denied. This is that illegal trade in cigarettes existed even before the increased use of tobacco taxes to curb consumption. As mentioned above, the implementation of a comprehensive tobacco control policy only became part of the policy agenda when Nelson Mandela took over as president in 1994.

Due to racial segregation implemented by the National Party during the 1940's and beyond, there was also substantial economic segregation as well with certain racial groups not having access to formal markets. This resulted in a rapid increase in informal sector activity across a range of industries. Eventually these networks became very efficient. According to Joosens (1999), tobacco smuggling in some cases cannot only be ascribed to price differentials, various tax regimes and corruption, but is also to existing socio-economic habits. Furthermore, Bump et. al. (2009) state that "(the) acceptance of cigarettes and smuggling creates a culture of smoking that is hard to regulate or change". Tobacco control initiatives – especially sin taxes on cigarettes – need to take into consideration the significant informal sector already in existence in South Africa before implementing crude measures like tax hikes. This is an informal sector which has regularly traded in smuggled cigarettes and many other illegal goods for many years.

The existence of a relatively active informal trade in cigarettes and other tobacco before the implementation of more stringent tobacco excise taxes implied that individuals were in all likelihood able to switch between the legal and illegally traded cigarettes much easier because the networks and structures required to facilitate this type of market had already been in place (Joosens et. al., 2009). In essence, economic segregation of the past served as an important "spring-board" for the further development of illegally traded cigarettes.

This is further supported by the large contingent of foreign labour in South Africa. Such labour, which comes predominantly from the rest of Africa, has no doubt established additional informal trading networks.

6. Testing the hypothesis

According to Ouellet et. al. (2010), quitting is not the only solution available to consumers in the context of increasing sin taxes. Smokers may also resort to consuming alternative products as opposed to smoking. Quellet goes further and discusses options which include cross-border shopping for lower taxed tobacco products[22], cheaper brands and altering smoking behavior so as to consume more nicotine per cigarette smoked. However, "(T)*he most important mechanism might be contraband*" according to Quellet et. al. (2010).

There is evidence in South Africa that cigarette substitution exists; however, this substitution is seen to be between different categories of consumption. Again using the AMPS dataset we are able to determine the number of cigarettes smokers in South Africa. Table 4 below shows that there has been no significant decline in the number of smokers in South Africa since 1999. In fact, there were more smokers in 2008 than there were in 1999. As mentioned before, this trend indicates that tax-induced (annual) decreases in recorded consumption have been more than compensated by increases in the number of smuggled cigarettes smoked.

Table 4: Number of smokers in South Africa: 1999 - 2008

| Year	Number of smokers
1999	7 169 706
2000	7 719 422
2001	7 110 131
2002	7 305 304
2003	7 142 455
2004	7 297 995
2005	7 115 081
2006	7 214 185
2007	7 558 077
2008	7 336 911

Source: AMPS

Furthermore, cigarette consumption in South Africa is mainly driven by heavy smokers (i.e. individuals who smoke between 11 – 99 cigarettes per day) as illustrated by Figure 8 below,

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[22] As the relatively lower tax rate now makes these products relatively cheaper.

which shows that heavy smokers consumed approximately 77% of all cigarettes in South Africa during 2008. Intuitively it can be said that these consumers are likely to be more addicted to smoking and therefore likely to seek contraband alternatives to legal cigarettes should the latter become relatively more expensive. This is in line with a study conducted by Lee et. al. (2008), focusing on the demand for smuggled cigarettes in Taiwan, which showed that heavy smokers are more likely to buy smuggled cigarettes in an attempt to save money while simultaneously continuing to consume the same level of cigarettes. This further supports the idea that substitution exists in South Africa.

Figure 8: Cigarette consumption in terms of "habit"
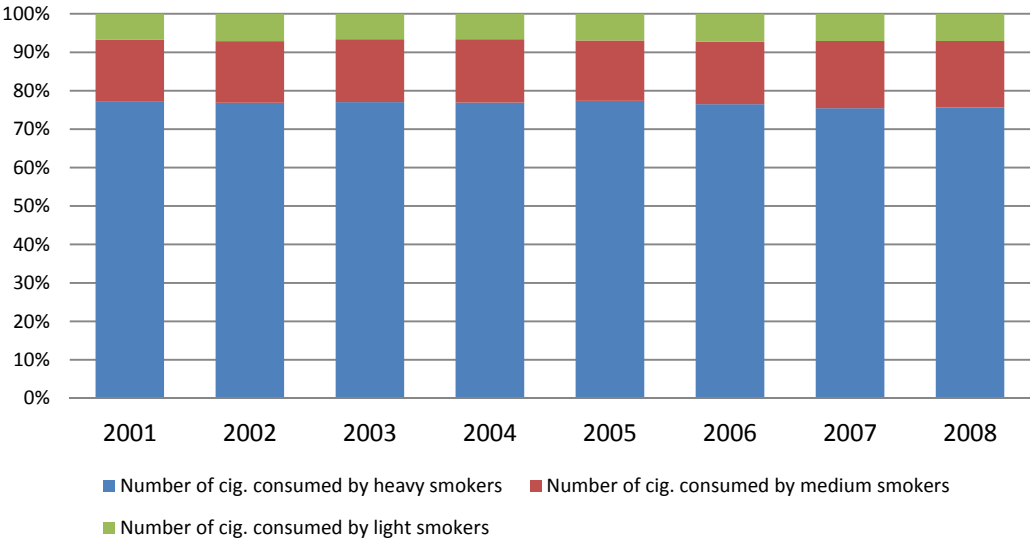
Source: AMPS

We also argue that smuggled cigarettes are of inferior quality compared to their recorded counterparts, and that a tax hike on the latter may have a negligible if not perverse effect on the overall size of the externality. Part of South Africa's focus within their broader tobacco control policy has been the regulation of tobacco products, in other words, reducing the amount of harmful substances found in tobacco products. But smuggled cigarettes do not have to adhere to these strict product content requirements and their producers do not usually incur the additional costs involved in complying with such regulations (SARS, 2007). This means that from an externality point of view (early death, additional health costs), the consumption of illegal cigarettes yields a greater negative externality than the consumption of an equal quantity of legal cigarettes (Black and Mohamed, 2006; WHO, 1996).

Several international studies confirm this difference in addictive and harmful substances between illegal and legal cigarettes. Research conducted in the UK showed that on average, counterfeit cigarettes contain much higher concentrations of harmful substances than their

legally produced counterparts. In fact, the research shows that counterfeit cigarettes in the UK[23] contain 3 times more arsenic, 5 times more cadmium and 5.8 times more lead than legally manufactured cigarettes. The nicotine, tar and carbon monoxide contents are also significantly higher in counterfeit cigarettes than genuine cigarettes. This is supported by research done in Australia by Aiken et. al. (2009), in which smokers were surveyed[24] and asked questions regarding their consumption of illicit tobacco products. The survey results revealed that both current and lifetime consumers of illicit tobacco products report significantly worse levels of mental and physical health than smokers of legal tobacco products.

7. International lessons from tobacco smuggling

Smuggling is by no means a new phenomenon. Many countries around the world suffer from concerns regarding tobacco smuggling.

According to a study conducted by Joosens et. al. (2009), close to 657 billion illegal cigarettes were consumed globally in 2007, which equates to 11.6% of total cigarette consumption. However, it was also found that the extent of cigarette smuggling differed between high and low income countries. Cigarette smuggling as a percentage of total cigarette consumption in high income countries totaled 9.8% and in low and middle income countries came to 12.1% in 2007 (Joosens et. al. 2009). The level of cigarette smuggling in 2007 is significantly higher than in previous years with the World Bank (2000) estimating that worldwide cigarette smuggling was between 6.0% and 8.5% of total cigarette consumption in 1995. The difference between 2007 and 1995 may not be that large but it is alarming to note that cigarette smuggling increased despite the fact that tobacco control measures and reforms were at their height during this time.

China is the country with the biggest illicit cigarette market which trades in approximately 214 billion cigarettes per year[25], followed by the Russian Federation with an illegal cigarette market totaling 76 billion sticks in 2004 (Joosens et. al. 2009). Despite the relatively large illegal cigarette market in China it is estimated to represent only between 8 and 10% of the

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[23] This has specific bearing on South Africa and both the customs agencies in South Africa and the UK note that China is a major supplier of counterfeit cigarettes, therefore the quality/content of counterfeit cigarettes in the UK and in South Africa are likely similar.

[24] The survey was based on illegal cigarettes in Australia referred to as "chop chop", a variation of local produced cigarettes which are exported and then imported illegally back into the country.

[25] This is across various years

total cigarette market. The United States, the European Union and Brazil make up the remainder of the top 5 biggest illicit cigarette markets. The level of cigarette smuggling internationally puts the South African illicit cigarette market in context. Whereas previous studies placed the size of the illegal cigarette market at no more than 9%, earlier in the paper it was calculated that the illicit cigarette market is probably closer to between 40 and 50 percent of total cigarette consumption. Furthermore, had the illegal cigarette market remained as big as in 2004 (an estimated 23.5 billion sticks), South Africa would have been considered as having the 6th biggest illicit cigarette market in the world.

However, there are countries that have been able to significantly reduce the incidence of tobacco smuggling. The most popular examples are Canada and the United Kingdom.

7.1. Canada

In Canada, tax induced price differentials (especially with the United States) saw the illegal cigarette market burgeon, reaching a peak of 40 per cent of total cigarette consumption in 1994 (Luk et. al., 2007). This prompted the federal government to reduce taxes on cigarettes (which again started rising during the early 2000's). Their more recent emphasis has been on supply chain intervention and increased education and research regarding tobacco smuggling. The effects of this are still unknown but tentative results are positive, as seen in Figure 9.

Figure 9: Number of cigarettes seizures: 1994 - 2008
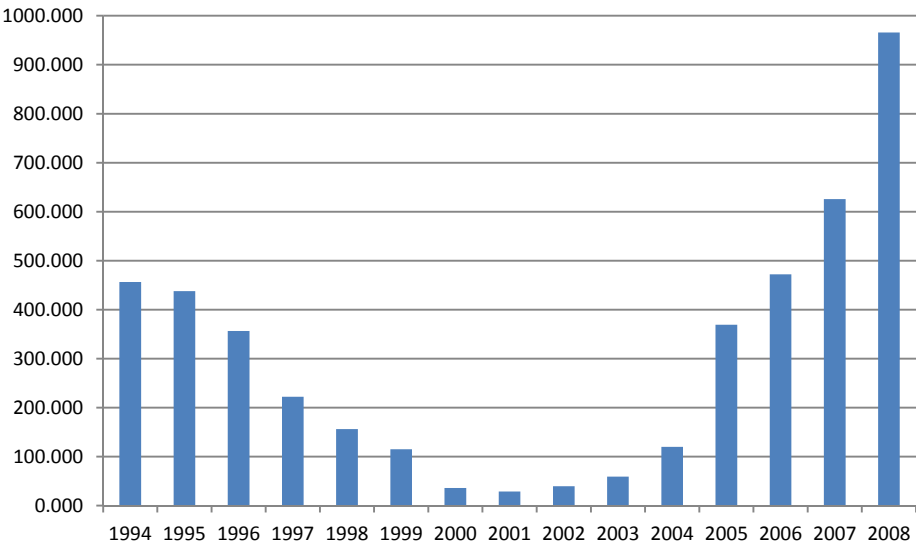

Source: Luk et. al. 2007

7.2. United Kingdom

The United Kingdom also struggles with cigarette smuggling, which in 2000/01 was estimated at 21% (or 16 billion sticks) of total cigarette consumption, up from 3% during

2006/07 (Joosens and Raw, 2008). Since then the incidence of smuggling has declined (see Figure 10) with the help of a tobacco control strategy focused on increased enforcement, increased punishment for offenders and a rigorous publicity campaign without having to revert to tax cuts.

Figure 10: Illicit cigarettes as percentage of consumption (UK)
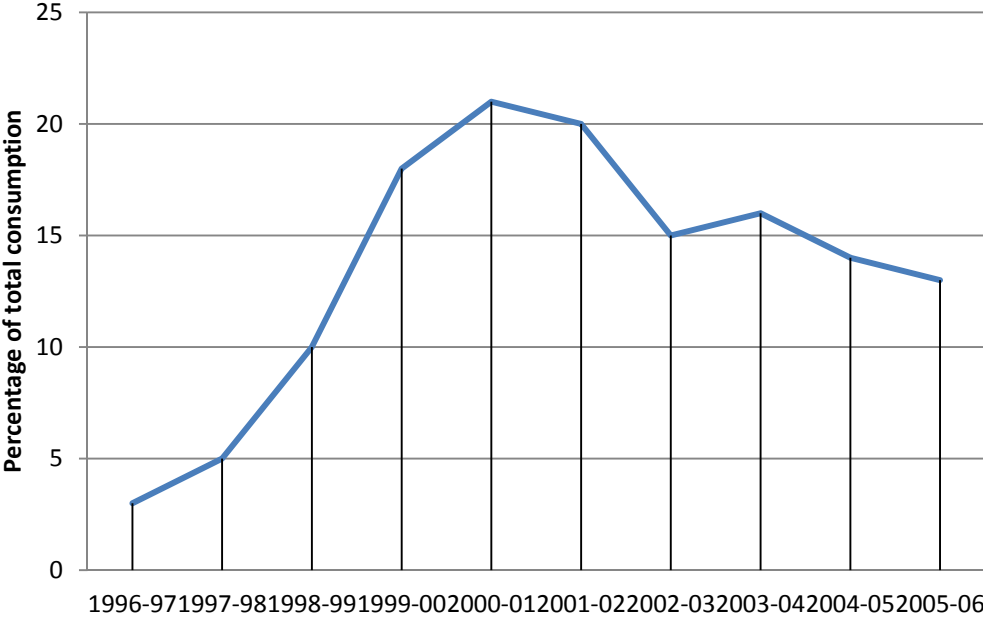
Source: Joossens and Raw, 2008

8. Conclusion

The main thrust of South Africa's "comprehensive tobacco control efforts" has been the use of sin taxes to increase the price and thereby reduce the consumption of cigarettes. However, little attention has been given to the unintended consequences of increasing cigarette taxes on consumer behaviour, especially in respect of cigarette smuggling. There have been very few studies measuring the extent of cigarette smuggling in South Africa and those that have show that a very small illicit cigarette market exists. However, using a methodology suggested by the World Bank where official cigarette consumption is compared with cigarette consumption figures as derived from a survey – in the South African case the AMPS data – shows that an illicit market of between 40 and 50 per cent of the total cigarette market exists in South Africa. The existence of such a significant level of cigarette smuggling is further explained by some of the factors discussed in the literature. These include cigarette price differentials amongst countries and corruption, both of which seem to have some significance in the South African context. In addition to these traditional factors, there does seem to be evidence that a significant level of smuggling existed even before the implementation of regular increases in sin taxes on cigarettes. This is also a crucial factor as it implies that smuggling is more

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"institutionalized" in South Africa and that the networks and infrastructure required to facilitate illegal activity are more advanced and more commonplace.

This paper provides evidence that the existence of such a huge illicit tobacco market in South Africa may well imply a higher negative externality than previously assumed. Firstly, the existence of smuggling implies that tax hikes have not resulted in a significant decline in cigarette consumption. There is evidence to suggest that smokers substitute illicit cigarettes for legal cigarettes as a result of tax-induced increases in the price of the latter. So, the reduction in the negative externality that was supposed to be achieved by the tax-led reduction in consumption is likely to be thwarted. Furthermore, international evidence shows that smuggled cigarettes are typically of a lower quality than legally manufactured cigarettes, thereby potentially causing a greater externality per cigarette consumed than its legal counterpart. Sin tax hikes may thus have the perverse effect of boosting rather than reducing the negative externalities associated with smoking.

International examples of methods to combat cigarette smuggling seem to suggest that the best course of action is to address the supply side of smuggled cigarettes rather than the demand side. In the case of Canada and the UK a greater emphasis was placed on increasing border controls and monitoring. In Canada the anti-smuggling efforts also included significant reductions in tax rates in an attempt to address the price differentials that existed between Canada and the USA in particular. The incidence of cigarette smuggling has declined in the UK and Canada but there is evidence that tobacco smugglers are becoming more innovative in the way they operate, forcing the governments in the UK and Canada to be more vigilant in their anti-smuggling efforts. Furthermore, case studies in the UK, Canada, Sweden and other countries reveal that tobacco control policies and policies aimed at reducing the incidence of cigarette smuggling differ from country to country and need to take into consideration country specific nuances in respect of tobacco consumption and smuggling.

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