



***IMPACT OF MPOWER TOBACCO CONTROL POLICIES ON SMOKING
PREVALENCE AND ISSUES OF ILLICIT CIGARETTE TRADE***

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By

WENCY BUI KHER THINNG

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
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January 2019

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

IMPACT OF MPOWER TOBACCO CONTROL POLICIES ON SMOKING PREVALENCE AND ISSUES OF ILLICIT CIGARETTE TRADE

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January 2019

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Smoking is one of the significant public health threats and killing about six million people annually. Therefore, World Health Organization (WHO) introduced the Framework Convention on Tobacco Control (FCTC) since 2003, then later, WHO released the package of six MPOWER measure to assist the country with the implementation of the tobacco control policies. Malaysia officially joined with FCTC in 2005 and improved the Control for Tobacco Products Regulation according to the MPOWER measures in 2008. However, only 0.3% reduction on Malaysian smoking prevalence between the year 2011 and 2015 and such small reduction has become a major concern among the policy-makers to achieve the two targets; non-communicable disease (NCD) voluntary target (15% by 2025) and End-Game target (less than 5% by 2045).

Besides, the elimination of illicit cigarette trade is also a concern by policymakers. Therefore, surveillance is indeed to combat the illicit cigarette trade, but these are underground activities and unlikely to get recorded. Yet, the industry-involved studies showed that Malaysia has high illicit cigarette market share, but these studies have been claimed that always exaggerate the incidence of illicit cigarettes. Thus, the tobacco industry also argued that high retail price caused by taxation creates incentives for illicit trade. However, many studies have proven that their arguments are invalid.

This study conducted three analysis for three research objectives. First, Abridge SimSmoke model was employed and accompanied by the reinforcement of non-price tobacco policies and taxation; the cigarette retail price is simulated to at least increased from RM16.20 to RM22.05 to achieve the NCD target. However, for the End-Game target, the cigarette retail price is required to be increased to at least RM40.40.

Secondly, this study obtained cigarette consumption and sales data from government

agencies and conducted the discrepancy method to measure the size of illicit cigarettes in Malaysia. In 2015, 7,718.8 million sticks of illicit cigarettes were consumed and generated at least RM2,161.3 million loss of excise tax revenues. Also, the measure of illicit cigarette market share was exaggerated by the tobacco-involved studies where they are more likely to understate the legal sales data and create a higher rate of illicit market share.

Lastly, a panel data analysis of 61 countries for nine years was estimated using the system generalized-method-of-moments estimators. The results diverge from the tobacco industry claims since high retail price does not increase the illicit cigarette trade. The country with better governance can further mitigate illicit problems. Therefore, it requires substantial implementation of tobacco control by the governments and intense enforcement strategy to reduce illicit cigarettes trade.

From all the findings, the Malaysian Government should consistently increase tobacco taxation to achieve the targets since the price indicator is not a significant factor in driving the illicit cigarette trade. Instead, enforcing a better governance quality in addressing the problem of illicit cigarette trade. These efforts would potentially reduce the smoking prevalence and smoking-attributable deaths in Malaysia and able to achieve the targets, hence combat the illicit cigarette trade problem.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KESAN DASAR KAWALAN TEMBAKAU MPOWER PADA KADAR MEROKOK DAN ISU-ISU ROKOK HARAM

Oleh

WENCY BUI KHER THINNG

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Merokok adalah salah satu ancaman kepada kesihatan awam, dan membunuh sekurang-kurangnya enam juta orang setiap tahun. Oleh itu, Organisasi Kesihatan Dunia (WHO) memperkenalkan Konvensi Kerangka Kerja Pengendalian Tembakau (FCTC) sejak 2003, kemudian, melancarkan pakej MPOWER yang merangkumi enam kaedah pengukuran untuk membantu negara dalam melaksanakan dasar kawalan tembakau. Malaysia secara rasminya telah menyertai FCTC pada tahun 2005 dan menambahbaik Peraturan Kawalan Hasil Tembakau berpandu kepada pengukuran MPOWER pada tahun 2008. Walaubagaimana pun, kadar prevalen merokok di Malaysia hanya menunjukkan penurunan sebanyak 0.3% antara tahun 2011 dan 2015. Penurunan yang kecil ini menjadi kebimbangan utama di kalangan pembuat dasar untuk mencapai dua sasaran yang diperkenalkan oleh Kementerian Kesihatan Malaysia (KKM); iaitu sasaran Penyakit Tidak Berjangkit (NCD) secara sukarela (15% menjelang 2025) dan sasaran Penghujung-Permainan (kurang daripada 5% menjelang tahun 2045).

Selain itu, penghapusan rokok haram juga menjadi keutamaan kepada pembuat dasar. Untuk memerangi masalah perdagangan rokok haram, pengawasan adalah diperlukan, tetapi kegiatan ini melibatkan aktiviti bawah tanah dan tidak mungkin direkodkan. Walau bagaimanapun, kajian yang melibatkan industri menunjukkan bahawa Malaysia mempunyai syer pasaran rokok haram yang tinggi. Tetapi kajian ini telah didakwa kerap memperbesarkan saiz rokok haram. Di samping itu, industri tembakau berpendapat bahawa harga runcit yang tinggi yang disebabkan oleh cukai tembakau mewujudkan insentif untuk perdagangan rokok haram. Walau bagaimanapun, banyak kajian telah membuktikan bahawa pendapat mereka adalah tidak benar.

Kajian ini menjalankan tiga analisis untuk tiga objektif penyelidikan. Pertama, Model Ringkas Simulasi-Rokok telah digunakan dan berserta dengan pengukuhan dasar tembakau bukan harga dan pencukaian, simulasi harga runcit rokok menunjukkan ia

perlu ditingkatkan dari RM16.20 kepada RM22.05 untuk mencapai sasaran NCD. Walau bagaimanapun, untuk sasaran Penghujung-Permainan, harga runcit rokok memerlukan kenaikan sekurang-kurangnya kepada RM40.40.

Kedua, dengan pengumpulan data penggunaan rokok dan data jualan dari agensi kerajaan, kajian ini mengguna “kaedah percanggahan” untuk menganggarkan saiz perdagangan rokok haram di Malaysia. Didapati penggunaan sebanyak 7,718.8 juta batang rokok haram pada tahun 2015 dan menyebabkan sekurang-kurangnya RM2,161.3 juta kerugian cukai eksais kepada Kerajaan Malaysia. Begitu juga pengukuran syer pasaran rokok haram telah diperbesarkan oleh kajian yang dijalankan oleh industri tembakau di mana mereka lebih cenderung untuk memperkecilkan data jualan rokok sah dan mewujudkan syer pasaran rokok haram yang lebih tinggi.

Akhirnya, analisis data panel dari 61 negara untuk 9 tahun dianggarkan dengan mengguna penganggar sistem kaedah-momen-umum. Hasil kajian berbeza dari tuntutan industri tembakau, di mana cukai yang tinggi ke atas rokok sah tidak meningkatkan perdagangan rokok haram. Ternyata, negara yang mempunyai tadbir urus yang lebih baik dapat mengurangkan masalah rokok haram. Oleh itu perlaksanaan dasar kawalan tembakau yang lebih berkesan diperlukan oleh kerajaan beserta dengan strategi penguatkuasaan yang lebih ketat untuk mengurangkan perdagangan rokok haram.

Dari semua hasil anggaran, Kerajaan Malaysia harus meningkatkan cukai tembakau secara konsisten untuk mencapai sasaran, kerana harga bukanlah faktor penting dalam memacu perdagangan rokok haram. Sebaliknya, menguatkuasakan tadbir urus dengan lebih baik dalam menangani masalah perdagangan rokok haram. Semua usaha ini berpotensi untuk mengurangkan kadar prevalen merokok, kematian disebabkan merokok di Malaysia serta dapat mencapai sasaran KKM di samping membentaras perdagangan rokok haram dan meningkatkan hasil cukai kepada kerajaan.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARDL	Autoregressive Distributed Lags
AR	Autocorrelation
BAT	British American Tobacco
BP	Bupropion
CMTM	Confederation of Malaysian Tobacco Manufacturers
CPI	Consumer Price Index
CSR	Corporate Social Responsibility
CTPR	Control for Tobacco Products Regulation
CUSUM	Cumulative Residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
DOS	Department of Statistic
EI	Euromonitor International
FCTC	Framework Convention on Tobacco Control
GATS	Global Adult Tobacco Survey
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GST	Good and Service Tax
HDI	Human Development Index
HIC	High-income country
IKU	National Institutes of Health (Institut Kesihatan Umum)
ITC	International Tobacco Control
ITIC & OE	International Tax and Investment Center and Oxford Economics
JTI	Japan Tobacco International
LIC	Low-income country
MIC	Middle-income country
MOH	Ministry of Health
MPI	Ministry of Primary Industries
NCD	Non-communicable Diseases
NHMS	National Health & Morbidity Survey
NRT	Nicotine Replacement Therapy
OLS	Ordinary Least Squares
PMI	Philips Morris International
POS	Point-of-Sales
PP	Philip-Perron
PPP	Purchasing Power Parities
RMC	Royal Custom Malaysia
SAD	Smoking-attributable Death
SEATCA	Southeast Asia Tobacco Control Alliance
SFL	Smoke-free Legislation
SHS	Second-hand Smoke
US	United States
UK	United Kingdom
VRC	Varenicline
WDI	World Development Indicators
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

Tobacco use is the leading cause of some preventable deaths and it imposes a heavy burden to the countries in terms of direct medical care for adults and productivity loss (WHO, 2015b). The tobacco use has risen the number of deaths from 6 million to 7.2 million worldwide per year (WHO, 2011) and 80% of the smoking-attributable deaths (SADs) occurred in low-income countries (LICs) and middle-income countries (MICs) (WHO, 2011, 2017). Indeed, the tobacco epidemic has moved to LICs and MICs, where these countries have also been struggling to combat tobacco industry interference in influencing the public health policy decisions (WHO, 2017). In the case of Malaysia which is an upper-middle income country (World Bank, 2017), there are 22.8% of adults whose aged 15 years old and above are currently smoking and consuming an average of 15 sticks cigarettes per day.

In recognition of the threat that tobacco use poses to global public health, World Health Organization (WHO) implemented the Framework Convention on Tobacco Control (FCTC) since 2003, then later, WHO introduced the six highly effective and cost-effective measures in 2008, known as “MPOWER”¹. MPOWER is a policy package meant to assist the implementation of effective interventions to reduce tobacco use worldwide at the country level including to save lives. In this regard, Malaysia has amended the Control of Tobacco Products Regulation (CTPR) based on the FCTC, and also included the MPOWER elements in compliance with these tobacco control policies to fight against tobacco use in the country. Additionally, the Malaysian Government has set to achieve its targets to reduce the smoking prevalence rate to 15% by the year 2025² and less than 5% in 2045³. However, the implementation levels of the current tobacco control policies in Malaysia are still considerably low according to MPOWER measures. The most worrying fact is that the decline in the overall smoking prevalence rate in Malaysia was only 0.3% from 23.1% in 2011 to 22.8% in 2015. If the currently implemented MPOWER tobacco control policies remain at the same levels, then it is a

¹ The six measures of MPOWER tobacco control policies package includes (M)onitor tobacco use and prevention policies, (P)rotect people from tobacco smoke, (O)ffer help to quit smoking, (W)arn about the dangers of smoking, (E)nforce bans on tobacco advertising, promotion and sponsorship, and (R)aise taxes on tobacco.

² World Health Assembly had a meeting among the member states and set up a set of voluntary global targets for the prevention and control of non-communicable diseases (NCD) at November 2012 (WHO, 2012a), and these targets endorsed in 2013 (WHO, 2013). The tobacco target is one of the nine NCD targets which is a relative reduction in the prevalence of current tobacco use in persons aged 15+ years old (WHO, 2014). As a party, the Malaysian Government contribute this target by setting up the target of 15% by 2025.

³ End-game target is a concept that suggests beyond tobacco control, toward a tobacco-free future (Smith, 2013). Generally, this target brings the idea of seeking to the end the tobacco epidemic rather than control tobacco use, and it has emphasised for national and international meeting hence has encouraged long-term planning (McDaniel, Smith, & Malone, 2016). Some governments set End-Game targets of less than 5%, for example, New Zealand (by 2025), Ireland (by 2025), Canada (by 2035). Yet, Finland set the lowest target which less than 2% by 2040. Moreover, the End-Game target that set up by the Malaysian Government is to decrease the smoking prevalence rate to 5% by 2045.

challenging to achieve the Ministry of Health (MOH) targets.

In addition, the FCTC's Article 15 indicated that the elimination of illicit trade in tobacco products is also the essential components of tobacco control. Illicit cigarette trade has been a matter of concern by all the governments including Malaysia. The global illicit cigarette market share was estimated at 11.6% of the cigarette consumption, which was about 650 billion illicit cigarettes traded in 2007 (Joossens, Merriman, Ross, & Raw, 2010). On the other hand, the tobacco industry claimed that legal cigarette price hikes are the main factor prompting the wide spread of illicit cigarette trades. Indeed, the pricing issue has always been used by the tobacco industry as a tool to negotiate with governments in regulating the tobacco control policies, particularly on taxation. However, the industry arguments are not true, as other factors such as border control, corruption, weak enforcement, established illegal organizations are more likely to be the contributing factors of the illicit cigarette trade (Joossens & Raw, 1998).

In this context, the aim of this thesis is to focus on three critical attributes of cigarette used analysis in Malaysia. This included the impact of MPOWER tobacco control policies on smoking prevalence rate, size of illicit cigarette trade, and its determinants by empirically examining the relationship between the legal retail price and governance indicators globally. Lastly, the policy implications of MPOWER are drawn to reform and strengthen the current tobacco control framework in order to reduce smoking prevalence rate and illicit cigarette trades in Malaysia.

1.1 Overviews of Smoking Status in Malaysia

The smoking prevalence in Malaysia is considered high, particularly among the males. In order to monitor and improve the health status among Malaysians, the government has conducted a series of the National Health and Morbidity Survey (NHMS) in 1986, 1996, 2006, 2011 and 2015. One of the vital components of NHMS is monitoring the smoking prevalence which serves as an indicator for the efficacy of tobacco control policies. However, the trends of smoking prevalence are somehow difficult to formulate, due to the problem of differences in working definitions used between the NHMSs, and this problem was mentioned in the report of NHMS 2015 (Institute for Public Health, 2015). Apart from the NHMS, MOH also collaborated with WHO and jointly conducted the Global Adult Tobacco Survey (GATS) for Malaysia in 2011. GATS 2011 provided the standardised questionnaires and used the same definition of smokers' status across the participating countries, hence, allowing more accurate comparison with other nations. For systematically monitoring of tobacco use in Malaysia, MOH has also used the shorter version of GATS questionnaires for NHMS 2015. In particular, GATS 2011 and NHMS 2015 share the same terminology and definitions, and hence this study only focused on these two surveys.

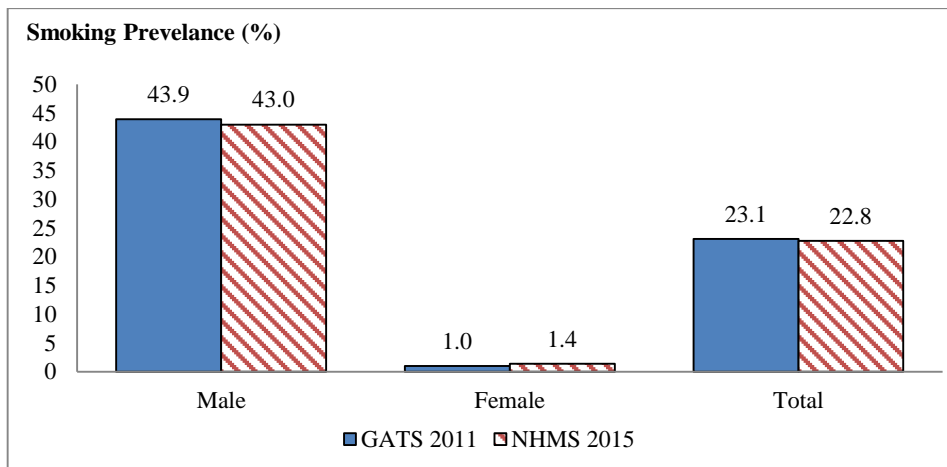


Figure 1.1: Malaysian Smoking Prevalence Rate in 2011 and 2015

Data Source: GATS data retrieved from GATS 2011 report, NHMS 2015 data retrieved from IKU MOH Malaysia.

Clearly, between 2011 and 2015, the tobacco control policies had successfully reduced the smoking prevalence, from 23.1% to 22.8% (as shown in Figure 1.1). In terms of gender, historically, men smoked more than women, but the smoking prevalence rate among men seems to decline from 43.9% to 43.0% compared to the women which increased from 1.0% to 1.4%. The small reduction in the smoking prevalence rate of the males within the 4 years (2011-2015) becomes a major concern to the policy makers on the implementation level of MPOWER tobacco control policies in Malaysia and the need to strengthen the policies to achieve the MOH targets of 15% and less than 5% smoking prevalence in 2025 and 2045 respectively.

1.1.1 Health Impacts and Economic Burden

In general, smoking behaviour causes high premature mortality and morbidity, thus leading to escalation of undesirable health impacts and economic burden. It is reported that smoking kills more people than HIV/AIDS, malaria and tuberculosis combined (WHO, 2017). Based on the mortality data in 2004, WHO estimated that approximately 6 million SADs annually, in which 71% of all lung cancer deaths and 42% of all chronic obstructive pulmonary diseases (WHO, 2012b). In Malaysia, smoking behaviour ranks third behind the issues of obesity and physical inactive for the risk factors for the impairment of the citizens' health status (MOH, 2012). It was also reported in 2014, that about 25% of hospitalisations and 40% deaths in Malaysian public hospitals and 19% of hospitalisations and 40% deaths in private hospitals were caused by smoking-related illness (MOH, 2015). A study demonstrated that in Malaysia, smoking has a prognostic impact on patients with lung cancer (Sajid, Bangash, Hashim, & Ismail, 2017). In sum, smokers are likely to have shorter life expectancy compared to non-smokers (Doll, Peto, Boreham, & Sutherland, 2004; Jha, Ramasundarahettige, Landsman, Rostron, Thun, Anderson, McAfee, & Peto, 2013).

The negative health impacts of smoking are not only limited on the smokers, but also the health consequences it brings on those second-hand smoke (SHS) exposure, who are actually not smoking (non-smokers). The non-smokers inhale tobacco smoke that comes from other smokers as well as the smoke that is produced by the burning tobacco. There were approximately 2.5 million deaths caused by smoking and exposure to SHS in US from 2010 to 2014, (U.S. Department of Health and Human Services, 2014). It is important to strengthen the tobacco control policies by enforcing more SFL in enclosed space to protect the non-smokers from tobacco smoke. For example, Tsai, Wen, Hu, Cheng, & Huang (2005) highlighted that the smoking workers had caused their Taiwan companies to suffer US\$1 billion financial loss in productivity which accounted for 0.36% of Gross Domestic Product (GDP) in 2000 due to absenteeism, frequent smoking breaks, poor productivity and high risk of occupational injury, while at the same time the non-smokers can be exposed to SHS which will eventually affect their productivity.

Smoking-attributable deaths (SADs) extend a massive health burden and also economic costs. In developed countries, for example, the economic burden of the National Health Service in the United Kingdom (UK) was at least £3.3 billion in 2006-07 (Allender, Balakrishnan, Scarborough, Webster, & Bayner, 2009), and the annual medical costs for the United States (US), were around US\$167 billion by 2010 (Xu, Bishop, Kennedy, Simpson, & Pechacek, 2014). While in a developing country, Thailand, the smoking-attributable economic burden was approximately US\$2.18 billion including US\$1.18 billion from productivity losses and US\$370 million of total medical cost. The total cost of this smoking-attributable economic burden accounted for 19% of Thailand's total health expenditure in 2009 (Bundhamcharoen, Aungkulanon, Makka, & Shibuya, 2016). Similarly, in Malaysia, where the SADs and illnesses cause a huge economic burden to Malaysia prompting Al-Junid et al. (2006) to measure the annual direct cost of medical care on diseases attributed to smoking. Their findings revealed that RM116.60 million had been spent for the treatment of lung cancer, RM630.40 million spent for ischaemic heart disease and RM2,306.00 million spent for chronic obstructive pulmonary disease. All of these direct medical care costs constituted to 5.1%⁴ of Malaysia's GDP and 30.6%⁵ of total health expenditure. As a result of the increasing medical care cost, the Malaysian Government regulates and implements several tobacco control programs and campaigns to control cigarette consumption and reduce the proportion of smokers to the population in Malaysia.

1.2 MPOWER Tobacco Control Policies in Malaysia

WHO FCTC signifies the milestone in promoting public health and curbing the tobacco epidemic apart from providing the legal measurements for international health cooperation. Subsequently, WHO introduced the affordable and achievable six practical measures tobacco control policies in 2008, known as MPOWER. The MPOWER tobacco policies package includes **(M)monitor** tobacco use and prevention policies, **(P)protect**

⁴ $(3,053/596,784) \times 100\% = 5.1\%$, where the current GDP in 2006 = RM596,784 millions

⁵ $(3,053/(8,693 + 1,298)) \times 100\% = 30.6\%$ where in 2006, the health operating expenditures was RM8,693 millions and health development was RM1,298 millions.

people from tobacco smoke, **(O)ffer** help to quit smoking, **(W)warn** about the dangers of smoking, **(E)nforce** bans on tobacco advertising, promotion and sponsorship, and **(R)raise** taxes on tobacco. All these tobacco control policies are working complementarily to reduce the smoking epidemic (Mackay, Ritthiphakdee, & Reddy, 2013; WHO, 2008), and so far, it has successfully prevented 7.4 million premature deaths from 2007 to 2010 (WHO, 2013). Nearly half of the world which is almost 2.8 billion people are protected from tobacco smoke by at least one of the MPOWER tobacco control policies measures (WHO, 2015b).

Malaysia signed the FCTC on 23rd September 2003 and ratified the treaty on 16th September 2005 and become an official party to the convention on 15th December 2005. Then, Malaysian Government has implemented various tobacco control policies through the MPOWER measures as listed in Appendix A. The level of tobacco control policies in Malaysia according to MPOWER measures are summarized as in Table 1.1, which shows that the implementation levels of the tobacco control policies in 2015 has not achieved the highest levels. According to the MPOWER measures, monitoring smoking prevalence data is necessary to verify the effectiveness of tobacco control policies. For that reason, Malaysia has played an active role in monitoring the changes in the magnitude of smoking behaviour and tobacco use over time by continuously doing the representative youth and adult tobacco surveys. Malaysia implemented the tobacco control policies according to the MPOWER elements, including smoke-free policies, cessation programs, delivering health-warning messages, bans on tobacco advertising, promotion and sponsorship, ad a tobacco-related taxation. Besides, other than components of MPOWER, Malaysian Government also imposed a minimum price policy and also banned selling kiddie pack (14 sticks per pack) in the market.

Table 1.1: Malaysia MPOWER Tobacco Control Policies

M	P	O	W		E	R
Monitoring	Smoke-Free Policies	Cessation Programmes	Health Warnings	Mass Media	Advertising Bans	Taxation
*Active	Weak	Good	Very Good		Good	Good
*Score: 4/4	Score: 1/4	Score: 3/4	Score: 4/4		Score: 3/4	Score: 3/4

Note: *The score rates and active status are given based on the summary of MPOWER measures (See Appendix A)

The Malaysian Government has long implemented the smoke free legislation (SFL) to protect children and non-smokers from being exposed to tobacco smoke. In Malaysia, the expansion of smoke-free areas which completely banned smoking has become more comprehensive since it first started in 1993 (ITC Project, 2012). Initially, the designation of smoke-free areas began with healthcare institutions, public lifts, public toilets and public transportation (ITC Project, 2012). Currently, the smoke-free designated areas cover health care facilities, education facilities, government facilities, indoor office and workplaces, restaurants, cafes, pubs and bars (WHO, 2015a). As of 2017, there are 23 types of areas gazetted as non-smoking areas. Despite these comprehensive efforts are

taken, Malaysia scores the lowest marks in following the MPOWER measures (See Table 1.1), where only few public places are completely smoke-free. Hence, some studies found that the implementation of SFL is still weak in Malaysia and some suggested that the SFL should be more extensive in terms of its coverage (Lee et al., 2010; Zainol Abidin et al., 2014; Zulkifli et al., 2014). Additionally, the strength of SFL also relies on the level of enforcement of all related authorities. Higher enforcement level combines with severe penalties for those who violate the SFL will potentially increase the effectiveness of SFL.

The second element of MPOWER tobacco control policies is “Offer help to quit smoking”, in which the government offers smoking cessation programs *via* hospitals and clinics where the tobacco use disorder are treated through counselling and pharmacotherapy including Nicotine Replacement Therapy (NRT) and Varenicline. The health care providers’ involvements have been highlighted as a key element for successful cessation treatment services as this policy uses a brief intervention by health care provider where a physician gives advices or recommends quit techniques to the smokers (Levy & Friend, 2002). The smoking cessation program is offered by giving diagnosis and treatment of nicotine dependence through counselling services provided by medical professionals such as physician, dentist, nurses and pharmacists (ITC Project, 2012). In order to assist smokers to quit, the Malaysian Government has covered all the costs of treatment at public clinics and hospitals (WHO, 2015a). In 2016, a more comprehensive smoking cessation program known as mQuit⁶ was launched in Malaysia, which provides cessation services such as customised quit smoking plan, professional advice, comprehensive follow-up session by dedicated health care professionals, and NRT to facilitate smoking cessation.

The delivery of health warning messages is also important to communicate widely the risks of smoking so that it increases the awareness of the harm that smoking behaviour brings to the public. Following the MPOWER measures, Malaysia has implemented a strong health warnings policy with a large warning in graphic and text on the cigarette packs. The warning message contains pictures and texts covering 50% of the front and 60% of the back of the cigarette packages. This also includes six rotating pictorial warning labels which are displayed in Malay and English texts on the front label. Since 1st June 2015, the Malaysian Government has controlled the level of tar and nicotine content in the cigarette where not more than 1.0mg nicotine and 15.0mg of tar is allowed in each cigarette stick. Producers are also prohibited to print the level of tar and nicotine on the labels. For example, the descriptions of “low tar”, “mild” and “light” on cigarette packs are not allowed to be printed on the cigarette packet.

⁶ mQuit launched by MOH with cooperation of Universiti of Malaysia, Universiti of Sains Malaysia, and Malaysian Academy of Pharmacy, and Johnson & Johnson Sdn Bhd. The quit smoking application is available online, and for more information may visit <http://jomquit.moh.gov.my/>.

The anti-smoking campaign was part of a comprehensive tobacco control program, and they are sponsored programs by the Malaysian Government to deliver smoke risk information to the public. In particular, the mass media campaigns are originally designed to counter the effects of tobacco advertising by the tobacco industry, but in general its aim is to change individual behaviour by educating consumers on the smoking-related health risks. “*TAK-NAK*”⁷ campaign was one of the well-established campaigns conducted between 2004 and 2011 in Malaysia. It was publicly broadcasted on TV, radio, internet and print advertising and had successfully created awareness. The campaign was well recognised by the smokers (ITC Project, 2012; Zawahir, Omar, Awang, Yong, Borland, Sirirassamee, Fong, & Hammond, 2013), and supposedly it has increased the intention of quitting smoking among smokers (Lee et al., 2015). In general, a well-funded and implemented mass media campaigns meant for the general population and implemented at the national level, combining with a comprehensive tobacco control programs are associated with the serious intention of the government in reducing the smoking prevalence rate (Friend & Levy, 2002).

In a similar vein, the enforcement bans on advertising, promotion and sponsorship are intended to prevent tobacco manufacturers from using price discounts to offset the impact of higher taxes. The reason for enforcing such ban is justifiable as the advertising and promotions are able to increase the attraction of smoking through the power of creative expression like creating an image favourable to those considering or already engaged in smoking (Levy, Chaloupka, & Gitchell, 2004). Alternatively, manufacturers might use the price discount such as coupons, multipack deals and targeted price discounting to encourage sales due to a higher price after tax (WHO, 2015b). Under the local regulations, the manufacturers have not been allowed to do any direct tobacco advertising, sponsorship and promotion in Malaysia since 2004. Comprehensive bans on advertising and promotions significantly reduce the tobacco use, but partial bans are not associated with reductions in tobacco use (Saffer & Chaloupka, 2000). If the bans are at a particular medium level, the tobacco industry merely forwards expenditures to places where advertising is permitted (World Bank, 1999). Therefore, a comprehensive ban blocks the tobacco industry’s ability to influence through marketing to the young people who have no initiative to smoke and those smokers who are interested to quit (WHO, 2009).

While bans on both direct and indirect marketing are imperative in reducing cigarette consumption, Malaysia nevertheless has been giving more emphasis on direct marketing ban rather than indirect market bans. At present, there are no indirect marketing bans on tobacco promotion and sponsorship, such as tobacco companies publicizing their corporate social responsibility (CSR) activities, and promotion and sales of non-tobacco products identified with tobacco brand names (WHO, 2015a). Evidently, the dominant legal manufacturer used CSR to challenge the effectiveness of tobacco control (Barracough & Morrow, 2008). For example, the British American Tobacco (BAT) Malaysia initiated a benevolent foundation, sponsorship and supported a shelter home for abused women and children (Barracough & Morrow, 2008). Apart from that, Malaysia has not adopted any bans at points of sales. As a result, Malaysia’s score in this

⁷ “*Tak-Nak*” means “Say No”.

category is 3 over 4 marks. Clearly, the situation indicates Malaysia has not achieved the highest level of enforcement through banning of all forms of direct and indirect advertisements but seemingly, it has implemented only moderate enforcement in MPOWER measures. Therefore, the Malaysian Government should seriously consider a comprehensive ban on direct and indirect advertisements and promotion on tobacco products.

Generating revenue from tobacco is the last category of the MPOWER measures which means raising taxes on tobacco. It is undeniable that tobacco tax policy plays a significant role in reducing cigarette consumption globally, as mentioned in WHO FCTC in Article 6 (WHO, 2003). An effective taxation policy would reduce cigarettes use by decreasing the affordability of cigarettes particularly among the low-income group and youths, while at the same time more tax revenues are generated due to the inelastic demand for cigarettes. Since cigarette demand in Malaysia is inelastic (Norashidah, Nik Mustapha, & Mastura, 2013; Ross & Al-Sadat, 2007); an increase in the price of cigarettes through increase taxation lead to the increase in the government revenue as well as reducing cigarette consumption across the entire population. Currently, the Malaysian Government has adopted a uniform excise tax structure and Good and Service Tax (GST) on cigarettes. The 6% GST was introduced on 1st April 2015 in the same year with the highest increased of excise tax rate from RM0.28 to RM0.40 or 43% per sticks in November. The proportion of excise taxes and total taxes to retail price are 49.4%⁸ and 55.1%⁹ respectively which are lower than the rate proposed by the WHO of 70% and 75%. Therefore, there is still opportunity for the government to continue increasing the cigarettes taxes and at the same time enhancing the implementation of MPOWER tobacco control policies in Malaysia. However, apart from controlling the legal cigarettes use, the illicit cigarette trade is becoming a prevalent problem and a severe challenge to public health. In overcoming these problems, the Malaysian Government has enforced the necessary laws and regulations to fight the illicit cigarette trade.

1.3 Illicit Cigarette Trade

Based on WHO FCTC Article 1, the definition for the illicit trade is:

“Illicit trade means any practice or conduct prohibited and which relates to production, shipment, receipt, possession, distribution, sale or purchase including any practice or conduct intended to facilitate such activity.”(WHO, 2003).

⁸ At November 2015, the retail price of most sold brand of a pack of 20-sticks cigarettes is RM16.20. The specific excise tax per stick is RM0.40 per stick, therefore, the proportion of excise taxes to retail price is $= [(RM0.40 \times 20 \text{ sticks})/RM16.20] = 49.38\%$

⁹ With 6% of GST rate to the final price but not retail price. Therefore, the GST rate to the retail price is 5.66% $\left[\text{GST}^* = \frac{\text{GST}}{1+\text{GST}} = \frac{6\%}{106\%} = 5.66\% \right]$, hence, the proportion of total taxes to retail price is $49.38\% + 5.66\% = 55.04\%$.

In general, illicit cigarette trade is described as those cigarettes that have averted tax authorities and traded illegally through smuggled, bootlegged, or are counterfeit (McEwen & Straus, 2009). According to Joossens et al. (2010) smuggling refers to the cigarettes that are traded across borders illegally; neither the payment of taxes nor abiding the laws prohibiting on trade. They also specified that there are two different forms of smuggling; a large-scale organized smuggling and a small-scale smuggling or bootlegging. Large-scale organized smuggling involves the illegal transportation, distribution, and sale of large consignments of cigarettes. Yet, the small-scale smuggling and bootlegging involves the purchases made by individuals or a small group in the country with low tax for resale in high jurisdictions.

Illicit cigarette trade has wider concept than smuggling which can be taken under a variety of forms, including illicit manufacturing, counterfeiting and contraband cigarettes. Fooks, Peeters, & Evans-Reeves (2013) defined illicit manufactured cigarettes are those cigarettes produced for consumption without acknowledging the tax authorities, and the commodity could also be manufactured in approved factories or illegal covert operations. In contrast, counterfeited cigarettes are produced by unauthorized manufacturers replicating the packaging or trademark of established cigarette brands without the owner's permission, and this is a violation of brand property rights. Yet, the contraband cigarettes are produced legally by the authorized manufacturers but circumventing the taxation and flow into the black market. These contraband cigarettes penetrate the country through smuggling networks to increase their market shares, sales, and profits or to infiltrate new markets (Joossens & Raw, 2012). Thus, these illicit cigarettes could be distributed to the underground market within the country or exported legally and then distributed to the underground market beyond borders, or illegally reimported to the origin country.

Additionally, WHO FCTC also provides Article 15 in order to adopt measures to eliminate this illicit trade in all form of tobacco products:

“The Parties recognize that the elimination of all forms of illicit trade in tobacco products, including smuggling, illicit manufacturing and counterfeiting, and the development and implementation of related national law, in addition to sub-regional, regional and global agreements, are essential components of tobacco control” (WHO, 2003).

Article 15 recognizes that the elimination of all forms of illicit cigarette trade, including large and small-scale smuggling, illicit manufacturing, and counterfeiting of existing brands and the legislation provides some guidance to all parties on how to achieve the eradication of such activities. Overall, to control the illicit trade, Article 15 suggested marking the tobacco packets to enable tracking and tracing, monitoring of cross-border trade, improving legislation, and confiscating proceeds derived from the illicit cigarettes (Husain, English, & Ramanandraibe, 2016). In the discussion of these illicit cigarettes, it is also important to understand that they consist two forms: legal tax avoidance and illegal tax evasions. The term illicit trade in Article 15 are referring to illegal tax evasion. Legal tax avoidance involves legal purchasing behaviour but the person is avoiding taxes

or paying less tax due to cross-border shopping, duty-free and internet purchases. On contrary, tax evasion involves illegal methods of avoiding taxes such as illicit trade or production of counterfeit cigarettes. Evidently, such legal tax avoidance (bootlegging) is a minor problem and used to be small in the market (Joossens & Raw, 1995; Nagelhout, Van Den Putte, Allwright, Mons, McNeill, Guignard, Beck, Siahpush, Joossens, Fong, De Vries, & Willemsen, 2014; Stehr, 2005). In this study, the illicit trade term is referring to both legal tax avoidance and illegal tax evasion.

1.4 Illicit Cigarette Trade in Malaysia

The illicit cigarette trade issue has been a priority for the Malaysian Government over the last few decades. Thus, in order to prevent the expansion of these illegal activities, the government has increased the penalty of up to RM10,000 and jail up to 2 years on those involved in purchasing or selling illicit cigarettes (Teh & Zolkepli, 2014, January 3). To further raise awareness of the flows of illicit cigarettes into the domestic market, the MOH has also described the characteristics of illicit cigarettes through mass media posters (posters attached in Appendix B).

The illicit cigarettes usually contain more than 45mg of tar which is far higher than the permitted level of 15mg per cigarette. The illicit packs are often without pictorial health warnings and they are sold only 12 or 16 sticks per pack (*The Star Online*, 2015). The higher levels of tar and nicotine increase the health risks of the illicit cigarette smokers and may increase the risk of addiction, thus making it harder for them to quit smoking. From the International Tobacco Control (ITC) Project's Southeast Asia survey, they found that the illicit cigarettes in Malaysia are much more affordable than legal cigarettes, which the average illicit cigarettes price was priced at about RM1.62 in 2004 and increased to RM4.23 only between 2011 and 2012 (Liber, Ross, Omar, & Chaloupka, 2015). The ITC Project (2012) conducted the survey-based study on illicit cigarettes by collecting used packs from self-reporting smokers in Malaysia. From the used cigarette pack, the market share of illicit cigarettes in Malaysia was estimated at 19% in 2009, which mainly originated from Sabah and Sarawak, and easily accessible from convenience stores. However, according to ITC Project (2012), the survey were likely to have been underestimated due to the fact that the packs were provided by a voluntary sample in 2009.

Because of its illegal nature, the size of the illicit cigarettes trades in Malaysia is difficult to measure. Illicit cigarette transactions are normally unrecorded, and it is categorised under the underground economy and therefore, unaccounted for in the country's GDP. As a result, the availability of the information on illicit cigarettes volume is limited in Malaysia, as well as globally. There are some data provided by the industry-involved analysis, where the methodologies are not well described. For example, the International Tax and Investment Center and the Oxford Economics (ITIC and OE) reported that 34.5% (7.9 billion sticks) and 35.6% (7.8 billion sticks) of the total cigarette consumptions were illicit in 2012 and 2013 respectively (ITIC and OE, 2014).

Since the study commissioned by the Phillips Morris International (PMI) to the ITIC and OE, the Southeast Asia Tobacco Control Alliance (SEATCA) has remained sceptical on the reliability of its methodology (Ross, 2015; SEATCA, 2014). This argument is consistent with the results of the study conducted by Chen, McGhee, Townsend, Lam, & Hedley (2015) that the ITIC and OE had doubled the size of illicit cigarette consumptions in Hong Kong in an effort to oppose the tax increase by the Hong Kong government. Similar to Hong Kong, the involvement of BAT, PMI and Japan Tobacco International (JTI) in the research of illicit cigarette trade in Malaysia also produce biased report (ITIC and OE, 2014, pg 159). Even, after all the arguments, ITIC and OE continued their estimation on illicit cigarettes in 2014 and 2015. They reported 6.7 billion and 6.6 billion sticks cigarettes were illicit in 2014 and 2015 which as much as 33.7% and 36.9% of the market share, respectively. However, their estimation seems to be lower in these two years but, they do not provide any details report or any explanation for these circumstances.

Given the above limitations, another source of providing the illicit cigarette trade data is from Euromonitor (Euromonitor International, 2017b). Euromonitor is a private commercial company that provides research on various markets of goods, including illicit cigarette trade in Malaysia for a number of years. However, the credibility of the estimations of Euromonitor's data is questionable due to the absence of the explanation on the methodology (Blecher, 2010; Blecher, Liber, Ross, & Birckmayer, 2013). However, the tobacco statistic provided by Euromonitor is still widely used by some studies such as Ho, Schafferer, Lee, Yeh, & Hsieh (2017), Ngo, Cheng, Chaloupka, & Shang (2017), Ngo, Cheng, Shang, Huang, & Chaloupka, (2018) and Seidenberg, Behm, Rees, & Connolly (2012). Despite scarce global statistical information on illicit cigarette trades, it should not hinder global dialogues on this important issue. Many estimation methods are important for the data to be comparable and this provides the basis for increased awareness on the importance of a thorough check of data delivered from other sources.

1.4.1 Impacts of Illicit Cigarettes

The world illicit cigarette market was estimated at 11.6% of the total cigarette consumption, representing 650 billion illicit cigarettes traded in 2007 (Joossens et al., 2010; Ross, Husain, Kostova, Xu, Edwards, Chaloupka, & Ahluwalia, 2015). These illicit cigarettes are global problem that threatens the public health and the illicit trade in cigarettes is a form of tax evasions and thus, the activities also inflict significant economic harm (Bialous, 2016). In the absence of control from the relevant authorities, it is learned that the potential harmful consequences to human health from smoking illicit cigarettes are potentially worse than legal cigarettes. The production of illicit cigarettes is not bounded by any legislation and does not abide by the approved level of tar and nicotine contents. The low quality of illicit cigarettes with higher nicotine and tar levels may affect smoker's health (Moodie, Hastings, & Joossens, 2012). Pappas, Polzin, Watson & Ashley (2007) found that counterfeit (illicit) cigarettes deliver much higher level of tar and nicotine compared to legal cigarettes. The mental and physical health conditions of the illicit cigarette smokers are significantly affected than those legal cigarette smokers (Aitken, Fry, Farrell, & Pellegrini, 2009). In addition, the high flows of illicit cigarettes trade which escaped the enforcement of tax authorities, thus leading

to the loss of government tax revenues. With the illicit cigarette trade holding 11.6% of market share around the world, governments are losing US\$40.5 billion tax revenue annually (Joossens et al., 2010).

1.5 Illicit Cigarette Trade versus Institutional Quality

On the other hand, the tobacco industry has consistently claimed that the availability of illicit cigarettes undermines the effectiveness and objective of tobacco control policies. They asserted that the availability and affordability of cheaper cigarettes would reduce the government tax revenues too. More importantly, they alleged that tobacco control policies are the main reason that drives the illicit cigarette trade. It has been argued that increasing cigarette taxes would lead to a larger illicit cigarette market, as some smokers may turn to cheaper illicit cigarettes due to higher legal cigarette prices. On contrary, Joossens & Raw (1998) argued that the allegation that higher cigarette prices would have elevated the illicit cigarette trade may not be true.

Figure 1.2 demonstrates that countries with highest volumes of total illicit cigarette trade do not necessarily have high price of legal cigarettes. For example, in 2016, Singapore had the highest cigarette price but the trading of illicit cigarettes was the lowest, compared to Philippines which had the lowest legal cigarette price but had the largest volume of illicit cigarette trade. Evidently, higher cigarette price is not the main factor that drives the illicit trade in cigarettes.

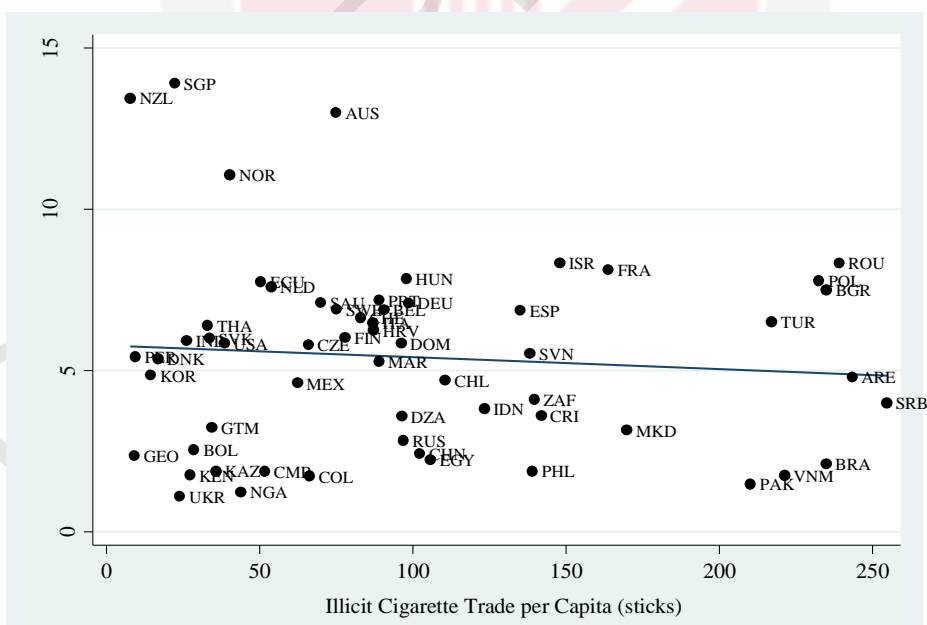


Figure 1.2: Illicit Cigarette Trade and Retail Price of a 20-cigarette pack in 2016
 Data Sources: Illicit Cigarette Trade per Capita is the total illicit cigarette trade volume that retrieved from Euromonitor and divided with total adult population from World Bank; Legal Cigarettes Retail Price for a pack of 20 cigarettes of the most sold brand in 2016 retrieved from WHO (2017).

Many other possible factors contribute to the higher trade of illicit cigarettes in the countries depicted in Figure 1.2; such as unbalanced fiscal policy, lack of official controls in free trade zones and border crossing, poor transit control, corruption, weak enforcement, obsolete law and sanctions, protectionist policies, the growth of illegal distribution networks, and public tolerance towards illicit cigarettes (Allen, 2012). From this situation, it can be implied that the role of institutional quality and governance is an important indicator to control the illicit cigarette trade. As proposed by Kaufmann, Kraay, & Mastruzzi (2009), the six dimensions of governance indicators are; control of corruption, government effectiveness, political stability and absence of violence, rule of law, regulatory quality, and voice and accountability. The following diagrams in Figure 1.3 show the relationship between the six dimensions of governance indicators and the size of illicit cigarettes in 2016.



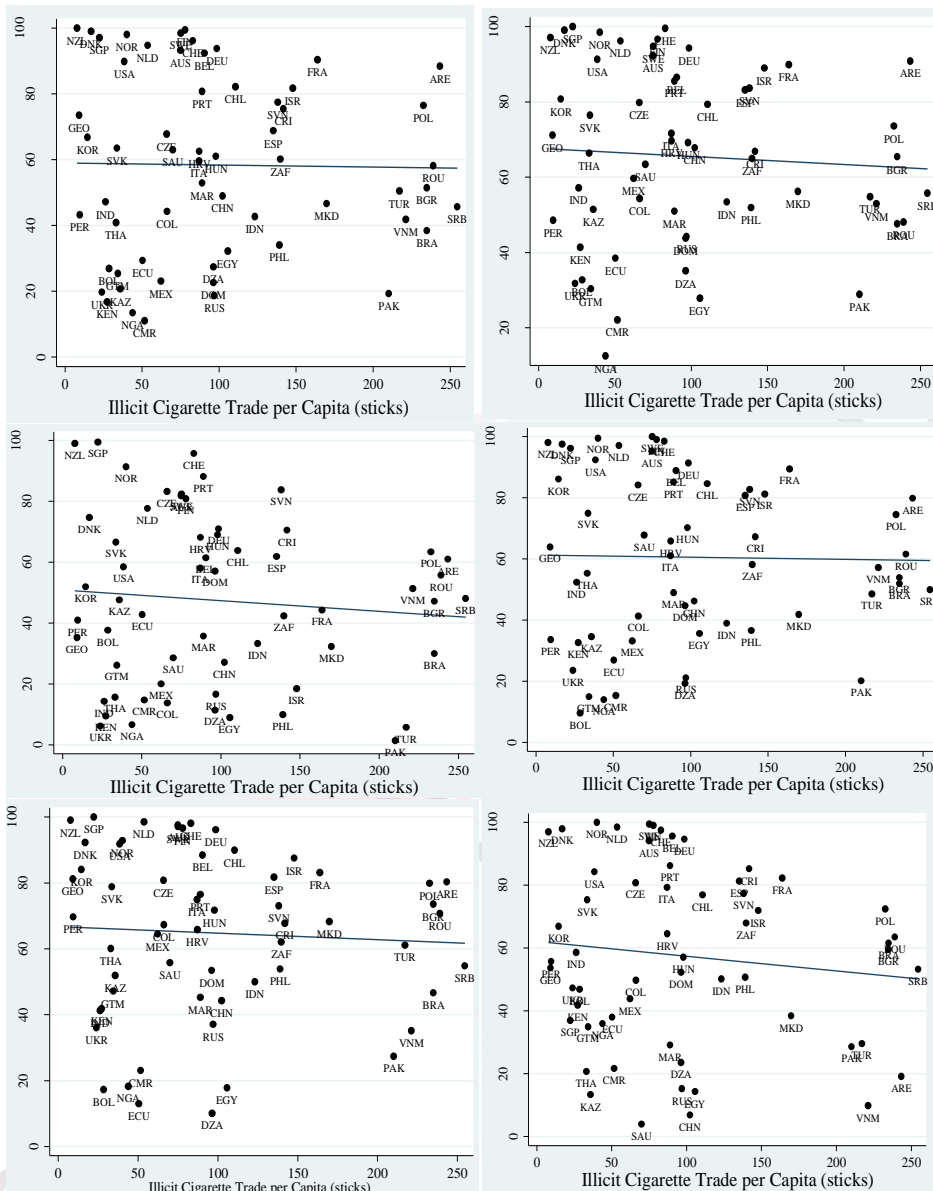


Figure 1.3: Illicit Cigarette Trade and Government Indicators in 2016

Data Sources: Illicit Cigarette Trade Volume retrieved from Euromonitor; Governance Indicators retrieved from Worldwide Development Indicators (WDI), World Bank.

Figure 1.3 illustrates that in 2016, the countries with large illicit cigarette trade volumes had lower level of country's rank of corruption control, while those countries which were ranked higher, are found to have small size of illicit cigarette trades in their countries. This is consistent with the study conducted by Merriman, Yurekli & Chaloupka (2000) who found that corruption was significantly more correlated to illicit cigarette trades than price. Besides than control of corruption, the other five dimensions of governance indicators are also important to be included in addressing the issue of illicit cigarette trade. Figure 1.3 shows that countries with high governance ranking indicator tend to

have low volume of illicit cigarette trade. which rank governance consistently high tend to have low volume of illicit cigarette trade.

1.6 Problem Statements

A small reduction of only 0.3% in the smoking prevalence from 2011 to 2015 has risen a major concern among policymakers. In order to achieve the MOH's targets, more studies should be carried out to examine the contribution of the MPOWER measures in reducing the number of smokers and the smoking prevalence rate within the targeted years. Among the MPOWER measures, taxation is always recognized as the most effective policy to reduce cigarette demand and to promote public health, which eventually these events are responsible in generating more tax revenue. However, taxation and other non-price tobacco control policies in the MPOWER measures work complementarily and synergistically. Therefore, the effects of the individual and combination of the MPOWER policies on the consumption of cigarettes and smoking prevalence are the focus of this research.

Imposing higher taxes and the innovative regulation on cigarettes are the issues that have always been argued by the tobacco industry as reasons which drive the illicit cigarette trade. In fact, all tobacco manufacturers have used this as a tool to mislead governments in making policy decision. Some of the studies funded by the tobacco industry always inflated the probable true volume of illicit cigarettes in the market (Van Walbeek & Shai, 2015). Their methods in estimation are not explained in details and the reliability of their analysis are questionable. This study would provide sufficiently useful information on the illicit cigarette market for the policymakers to take further actions in controlling cigarette smuggling activities in Malaysia.

Besides the factors discussed above, the tobacco industry has always claimed that the taxation caused the price differences between neighbouring countries, hence, price differences encouraged smuggling activities of illicit cigarettes. However, studies indicated that the presence of the illicit cigarette trade was unlikely to be related to the tax rates, but instead reflects a country's level of corruption and the authorities' failure to control borders against smuggling. Besides price factors, other variables associated with the illicit cigarette trade can also be of equal or greater importance in determining the illicit cigarette trade.

1.7 Research Questions

The research questions of this study are as follows:

1. What is the current level of MPOWER tobacco control policies that implementing in Malaysia and how much should improve in order to achieve the MOH's targets of smoking prevalence in 2025 and 2045?

2. Does the tobacco industry exaggerate the illicit market share in Malaysia? What is the size of the illicit cigarette market share in Malaysia based on the availability data and how much of tax revenues caused government loss?
3. Does the legal cigarette price matter on driving the illicit cigarette trade or governance indicators?

1.8 Research Objectives

The main objective of this study is to project the impact of tobacco control policies on cigarette demand and smoking prevalence rate in Malaysia. Besides, the size of illicit cigarette in Malaysia will be measured and further investigation on the determinants of illicit cigarette trade will be carried out. Therefore, the specific objectives of this study are:

1. To investigate and project the impact of changes in MPOWER tobacco control policies in achieving the MOH's targets of smoking prevalence in 2025 and 2045.
2. To measure the market share of illicit cigarette in Malaysia and the impact on the government tax revenue.
3. To examine the determinants of illicit cigarettes trade.

1.9 Significant of Study

Generally, smoking behaviour increases the risk of illness, premature deaths and some health care cost in Malaysia. In the attempt to mitigate this research gap, this study differs from most studies on smoking in Malaysia which focus more on taxation alone than other non-price tobacco control policies. Therefore, this study emphasises on the combination of these two variables; tax and non-price tobacco control policies in the effort to synergistically reduce the smoking prevalence. In order to achieve the target of 15% and less than 5% of smoking prevalence by 2025 and 2045 that set by the Malaysian Government this study will employ the Abridged SimSmoke simulation model aimed to investigate MPOWER policies in projecting effects on Malaysian smoking prevalence. This would be accomplished by improving the current MPOWER policies. Besides smoking prevalence, the simulation includes the number of averted smoking-attributable deaths based on the results of policies improvement. More importantly, this study provides policy recommendations to the Malaysian Government in achieving the targets and also reducing the smoking prevalence rate, diminishing the premature deaths, and providing better smoke-free environments for the new generations.

Besides highlighting the determinants of illicit cigarettes trade, estimating the size of illicit cigarettes trade and smuggling activities is another important benchmark that determines the efficiency of tobacco control policies in combating the illegal activities.

As the illicit trade data source is limited with no detailed description of its methodology, this has induced many studies to raise up the problem of reliability on the estimations of the illicit cigarette trade done by tobacco-involved studies. Unlike other existing studies, this study using the available aggregate data from the government agencies to examine the illicit cigarette trade data. This study would be a primary source of information for future research to reduce the potential loss of tax revenues. It also could be a good source of information for future research to investigate the sensitivity between tax policy, regulation, campaign and law and legal price towards illicit cigarettes. With more revenues generated from taxes on cigarette, the income could be used to fund more comprehensive anti-smoking health programs to increase awareness of tobacco risk and encourage more people to quit smoking.

1.10 Organization of Study

Overall, this thesis is organised into five chapters. The present chapter provides the essential background of this research including the global issues on smoking and illicit cigarette trade, in particular smoking trends, tobacco control policies and illicit cigarette trends in Malaysia. Chapter 1 also includes the problem statements, objectives and significance of this study. In Chapter 2, the relevant literature related to smoking status and tobacco control policies in Malaysia, related issues and determinants of illicit cigarettes would be reviewed. Chapter 3 presents the methodologies employed in this research. It explains and discusses the models applied in this study and the description of all related variables and explanation on methodologies for each model. Then, Chapter 4 presents the empirical findings and discussions of the results with reference to the objectives of the study. Lastly, Chapter 5 synthesizes all the chapters in the thesis by reiterating the key findings, looking at the extent that the stipulated objectives have been achieved, suggesting alternative solution to the problems and proposing avenue for future research and finally, concluding the study. Specifically, Chapter 5 would draw some policies implications and recommendations to Malaysian Governments on how the current taxation policy can be improved and how the current non-price policies can play a greater role, so that the price and non-price tobacco control policies complement one another in reducing smoking prevalence rate and combating the illicit cigarette trade in Malaysia.

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