



EMPIRICAL ANALYSIS OF CIGARETTE TAX AVOIDANCE AND EVASION IN VIETNAM

HIEN THU THI NGUYEN (Thuong Mai University – TMU)

LONG THANH GIANG (National Economics University – NEU)

TOAN NGOC PHAM (Institute of Labour Science and Social Affairs – ILSSA)

The Institute of Public Policy and Management (IPPM) was funded by the University of Illinois at Chicago's (UIC) Institute for Health Research and Policy to conduct this research in Vietnam. The views expressed in this document should not be attributed to, nor do they represent the views of UIC, or the Institute for Health Research and Policy.

CONTENTS

ABBREVIATIONS	3
EXECUTIVE SUMMARY	4
I. BACKGROUND.....	5
II. LITERATURE REVIEW	6
III. METHODOLOGY AND DATA SOURCES	9
IV. ESTIMATION RESULTS	12
V. DISCUSSION AND CONCLUSION	14

ABBREVIATIONS

BAT-	British American Tobacco
FCTC-	Framework Convention on Tobacco Control
GATS-	Global Adult Tobacco Survey
GSO-	General Statistics Office
LFS-	Labor Force Survey
MoH-	Ministry of Health
PMI-	Philip Morris International
SAE-	Small Area Estimation
STC-	Special Consumption Tax
VHLSS-	Vietnam Household Living Standard Survey
WHO-	World Health Organization

EXECUTIVE SUMMARY

Background

In Vietnam, excise taxes on cigarettes account for about 28.7% of the retail price, which is not only lower than the excise tax share of total retail price in many other countries, but also lower than the WHO's recommendation of 70%. There have been two opposing points of view in Vietnam in regard to illicit trade. The first group (comprised of social policymakers and tobacco control activists) believes a higher tobacco tax would not lead to a higher incidence of illicit trade. The key argument of this group is that illicit cigarettes are still preferred by users despite their higher prices as compared to tax-paid cigarettes. The second group, mostly representing cigarette-producing companies, claims higher taxes on tobacco would result in higher cigarette prices, which in turn encourages illicit trade. Given these opposing arguments, this paper examines the question of how an increasing tax on tobacco has affected illicit trade in Vietnam.

Methodology and data

This research estimates the gap between cigarette domestic tax-paid sales and domestic consumption using tax-paid sales from Vinacosh, Vietnam Tobacco Association, the General Tax Department, as well as two rounds of the Global Adult Tobacco Survey (GATS) (2010 and 2015).

Key Results

The results of this research indicate that Vietnam has a negative volume of illicit trade, either a result of underreporting of tobacco use or due to net smuggling of tax-paid cigarettes out of the country. Furthermore, the trend showed an increased negative volume over time. This indicates that increases in tobacco taxes in the interleading years did not result in an increase in tax avoidance and evasion in Vietnam. With consumption and sales trending upwards and tobacco taxes being much lower than internationally recognized levels, Vietnam has the opportunity to raise tobacco taxes and prices to reduce consumption.

I. BACKGROUND

Tobacco use is the most preventable cause of disease and death worldwide. Tobacco use leads to approximately seven million deaths each year (WHO, 2008) and is expected to cause over eight million deaths in 2030 (Mathers and Loncar, 2006). Vietnam is ranked among the world's top 15 consumers of tobacco with more than 15 million smokers, and the Vietnamese people spent about VND 22 trillion (or 985 million USD) a year on tobacco, which accounted for about 10% of total household expenditures (Medvedeva, 2016). Data from the Vietnam Tobacco Control Fund showed that the Vietnamese people consumed about 101 billion cigarettes in 2016. Levy et al., (2006) projected that smoking would lead to more than 50,000 deaths annually by 2023.

Given that smoking is extremely harmful to public health, the Government of Vietnam has made commitments and implemented measures to control tobacco production and consumption since 2000. Government Resolution No.12/2000/NQ-CP on “National Tobacco Control Policy 2000–2010” has been implemented by a Committee led by the Ministry of Health (MoH) and draws from most ministries and community organizations. In 2003, Vietnam signed the Framework Convention on Tobacco Control (FCTC) and ratified it in 2004.

Vietnam has an excise tax, called the Special Consumption Tax (SCT), on cigarettes for many years. In 2006, Vietnam reformed the SCT from a tiered rate of 45% and 65% on the wholesale price of different types of cigarettes to a uniform rate of 55% on all cigarettes. In April 2009, the SCT for tobacco increased to 65% of the wholesale price, and was increased again to 70% on January 1, 2016, and to 75% on January 1, 2019. The base on which the ad valorem tax applies – the wholesale price – is small, meaning that the tax share of price is low. In 2016, the World Health Organization (WHO) reported that excise taxes accounted for 28.7% of the price of the most sold brand in Vietnam, far below the WHO recommendation of 70% (WHO, 2017). Furthermore, due to under shifting of the tax increase into the price, the increases in the SCT have resulted in very little change in overall price in real terms (Blecher and Thu, 2018). According to the two GATS conducted in 2010 and 2015, the average price of a 20-cigarette pack declined by 6.3% in real terms between 2010 and 2015.

It has been argued that taxes on cigarettes have not been raised high enough to control tobacco consumption. Blecher and Thu (2018) also argue that the current tax structure has not been effective in reducing affordability for smokers because the tax did not adjust for inflation and economic growth. Due to these factors, cigarettes have become more affordable in Vietnam in recent years. Increasing cigarette taxes, along with reforming the tax structure will ensure decreased affordability, and incentivize a reduction in early initiation to smoking, as well as increase smoking cessation.

At the same time, tax increases have also faced strong objections from domestic cigarette manufacturers. The Vietnamese tobacco industry argued that cigarette smuggling activities in Vietnam have been complex and continue to intensify. They attribute this intensification to the higher prices of domestic products caused by the increase of excise tax levied on cigarettes (Vinataba, 2019). With such opposing arguments, the question remains: How have higher cigarette taxes affected illicit cigarette trade in Vietnam?

This research updates previous estimates of the illicit cigarette trade in Vietnam and assesses changes over time using a gap analysis method. The method estimates the gap between reported consumption from surveys and sales volumes as well as measures both tax avoidance and evasion.

While the primary focus of this paper is illicit trade, the gap analysis method also measures tax avoidance in addition to tax evasion. The WHO FCTC Protocol to Eliminate Illicit Trade in Tobacco Products (WHO, 2013) defines illicit trade as “any practice or conduct prohibited by law and which relates to production, shipment, receipt, possession, distribution, sale or purchase, including any practice or conduct intended to facilitate such activity.” This is a broad definition of illicit trade, however, for the purposes of this research, illicit trade is considered as trade without partial or full payment of taxes. This may take the form of tax evasion, which are illegal means of circumventing the partial or full payment of taxes like smuggling, or tax avoidance, which are legal mechanisms to avoid paying taxes.

The aim of this research is to provide policymakers with updated evidence on the magnitude and trend of the illicit cigarette trade in Vietnam. It is hoped that this study will be a reference for policymakers in drafting cigarette tax policies, as well as for tax administrators and enforcement agencies in effectively curbing the tobacco epidemic and in finding solutions to illicit cigarette trade in Vietnam.

II. LITERATURE REVIEW

Measuring levels and trends in illicit trade can be challenging. A body of literature on the subject has been developed applying different methods, each with their strengths and weaknesses.

A number of the studies on the effect of higher taxes on illicit trade imply two alternative outcomes: higher taxes on tobacco result in illicit trade, or higher taxes do not result in illicit trade. The reality is less clear cut. For instance, in the United States, at least \$2.95 billion in tax revenues losses were incurred by the states between 2010 and 2011, but this loss estimate masked significant variation among states. New Hampshire experienced large tax revenue gains, while New York saw large tax revenue losses (National Research Council, 2015). On the

global scale, it has been estimated that governments lose \$40.5 billion USD a year due to illicit trade (Joossens et al., 2010). Evidence from Canada, France, Sweden, and the United Kingdom, however, suggests that higher taxes could still lead to increases in revenues even in the presence of illicit trade (Joossens et al., 2000; International Agency for Research on Cancer, 2011).

In fact, illicit trade in tobacco is not only influenced by tobacco taxes, but is also affected by other factors which need to be considered in any analysis. For example, Health Canada (2007) implied that there various reasons for increased illicit trade of tobacco other than tax increases, including: a misconception by the general public that the purchase of cigarettes on First Nation reserves is legal (these are reserves set aside for indigenous populations that have special tax laws); a lack of publicity/information on the illicit nature of these cigarettes; easy access to tobacco; lack of police presence and enforcement; and open advertising of discount cigarettes on highways. Yurelki et al., (2010) (as cited by Schwartz and Zhang, 2015) explore the premise that increasing cigarette taxes and improving anti-illicit enforcement resulted in decreased illicit trade, decreased cigarette consumption, and increased tax revenues. Titeca et al., (2011) find that cigarette smuggling was not caused by a difference in tax levels in Central and Eastern Africa where cigarette prices are only \$0.60 USD per pack. A literature review by Schwartz and Zhang (2015) indicates that corruption, tolerance of illicit trade, and weak state capacity are more important than price or tax increases, implying that tax alone cannot solve the problem of illicit trade of tobacco. Schwartz and Zhang (2015), using information on Ontario, Canada, show that a serious focus on anti-contraband enforcement since 2008 (ACCESS) has led to a reduction in illegal trade and an increase in tobacco tax revenue. This is reinforced by global findings (NCI and WHO, 2016).

One recently used method for estimating cigarette tax evasion and avoidance is the “gap analysis,” which compares the difference between tax-paid cigarette sales and the measured population consumption. This method has been applied in a number of countries.

Blecher (2010) estimates the size of the market for illicit cigarettes in South Africa from 1997 to 2007. The market size for illicit cigarettes is calculated using data on smoking prevalence and simulated smoking intensity. The results show that the size of the illicit market grew substantially to between 9.4% and 11.5% of the total market during the study period, and that those numbers were significantly lower than the anecdotal claims of the tobacco industry. While scale of the illicit market was significant, it did not undermine tobacco control policy as consumption size in both the illicit and legal markets declined consistently, and tax revenue from higher excise taxes compensated for the taxes lost from illicit trade.

HM Revenue and Customs (HMRC) (2017) analyze illicit trade in the United Kingdom and show that the tobacco tax gap was estimated at £2.5 billion between 2016 and 2017. This tax gap is mostly driven by the illicit markets in cigarettes and hand-rolling tobacco. About 76% (or £1.9 billion) of the total was lost in tobacco duties, while the remaining (£0.6 billion) was in VAT. The report indicates that trends in the cigarette and hand-rolled tobacco market

appeared to be diverging along with tax applications. This could be explained by consumer preference, price, and policy initiatives. Estimates show that cigarette consumption decreased from 64 billion cigarettes in 2005-2006 to 36.5 billion cigarettes in 2016-2017.

Paraje (2018) uses a gap analysis method to estimate cigarette tax evasion and avoidance for Argentina, Brazil, Chile, Colombia, and Peru, and uses nationally representative surveys to measure population consumption. Paraje finds that illicit cigarette trade as a percentage of total sales increased in Brazil in recent years, while illicit trade in Argentina remained stable after a relative decrease during 2005-2009. Chile, Colombia, and Peru showed no clear evidence of any increase in illicit cigarette trade, despite substantial price increases in Chile as well as tax increases in both Colombia and Peru.

Three methodologies have been used to estimate illicit trade in Vietnam. Nguyen et al., (2014) employed the gap method as well as trade discrepancies, while Nguyen et al. (2019) used a survey of smokers and inspection of cigarette packs.

Using data from the Vietnam Living Standards Survey (VLSS) 1998, the Vietnam Household Living Standards Survey (VHLSS) 2006, the Vietnam National Health Survey (VNHS) 2002, and the GATS 2010, Nguyen et al., (2014) measure the magnitude of illicit cigarette trade for Vietnam between 1998 and 2010 using a gap analysis and trade discrepancies as recorded by Vietnam and trade partners. The research indicates that Vietnam experienced net smuggling, and discrepancies in trade records indicated that the value of smuggled cigarettes into Vietnam ranged from \$100 million to \$300 million USD between 2000 and 2010, and that these cigarettes primarily originated from Singapore, Hong Kong, Macao, Malaysia, and Australia.

Using data from GATS in 2010 and the Tobacco Consumption Survey in 12 provinces in 2012, Nguyen et al. (2019) find there was substantial illicit cigarette consumption in Vietnam: 20.68% of all smoked cigarettes were illegal, which was much higher than the average shares of illegal cigarettes at 9.8%, 11.8%, and 16.8% in high-, middle- and low-income countries, respectively. Nguyen et al. also find that the average price of legal cigarettes in Vietnam was \$0.55 USD, which was less than half the average price of legal cigarettes in low-income countries and one-tenth of that in high-income countries. The paper concludes that the combination of high illicit market share and lower-priced cigarettes in Vietnam as compared to other countries suggests that high tax and price are not the most important factors determining the scale of cigarette smuggling. The most striking finding of this research is that the prices of illegal cigarettes in Vietnam were consistently and significantly higher than prices of legal products. The authors provide a possible explanation for this: illicit smokers in Vietnam are not motivated by economic factors. Rather, they might perceive illicit cigarettes to have superior quality compared to those made locally.

Even though the gap analysis has proven its validity in estimating illicit tobacco trade in many countries at different income levels and under different legislation for tobacco control, it still has some key limitations. As addressed by Paraje (2018), the consumption gap analysis could

not provide an estimate of the size of the market for illicit products, but instead showed a trend in its evolution. Consequently, the number of illicit cigarettes or lost tax revenue was not calculated. More importantly, this method prevented the report from distinguishing between the different components of non-registered consumption or product counterfeiting. Thus, with underreporting, it must be assumed that the proportional share of each of these components remained stable over time (i.e., deviations in the trend implied deviations in illicit trade). Also, when conducting surveys on cigarette consumption, it should be assumed that the proportion of illicit cigarette consumption for non-surveyed groups (such as those aged 65 and over) is similar to that of registered cigarettes among the rest of the population.

III. METHODOLOGY AND DATA SOURCES

To estimate the magnitude of the illicit cigarette trade, a gap method is employed, updating Nguyen et al., (2014): comparing cigarette sales against consumption, and monitoring cigarette trade.

The method estimates the consumption of illicit cigarettes by calculating the discrepancy between domestic tax-paid sales of cigarettes and a survey-based estimate of consumption.

The report has the equilibrium of cigarette flows in and out of Vietnam in one calendar year, as follows:

$$\begin{aligned} & \textit{Cigarettes Domestically Manufactured} + \textit{Cigarettes Smuggled into Vietnam} + \\ & \textit{Cigarettes Legally Imported into Vietnam} + \textit{Cigarettes in stock at the end of the} \\ & \textit{previous year} = \textit{Domestic Cigarettes Consumed} + \textit{Cigarettes Legally Exported from} \\ & \textit{Vietnam} + \textit{Cigarettes Smuggled out of Vietnam} + \textit{Cigarettes in stock at the end of the} \\ & \textit{year of interest} \end{aligned} \quad (1)$$

Assuming that the stock of cigarettes at the end of all years is equal:

$$\begin{aligned} & \textit{Cigarettes Domestically Manufactured} + \textit{Cigarettes Smuggled into Vietnam} + \\ & \textit{Cigarettes Legally Imported into Vietnam} = \textit{Domestic Cigarettes Consumed} + \\ & \textit{Cigarettes Legally Exported from Vietnam} + \textit{Cigarettes Smuggled out of Vietnam.} \end{aligned} \quad (2)$$

Thus:

$$\begin{aligned} & (\textit{Cigarettes Domestic Consumed} - \textit{Cigarettes Domestically Manufactured}) + \\ & (\textit{Cigarettes Legally Exported by Vietnam} - \textit{Cigarettes Legally Imported into Vietnam}) \\ & = (\textit{Cigarettes Smuggled into Vietnam} - \textit{Cigarettes Smuggled out of Vietnam}) \end{aligned} \quad (3)$$

In one calendar year:

$$D = SMUGIN - SMUGOUT$$

(4)

In which:

- $D = (\text{Cigarettes Domestically Consumed} - \text{Cigarettes Domestically Manufactured}) + (\text{Cigarettes Legally Exported by Vietnam} - \text{Cigarettes Legally Imported})$
- $SMUGIN = \text{Cigarettes Smuggled into Vietnam}$
- $SMUGOUT = \text{Cigarettes Smuggled out of Vietnam}$

If $D > 0$, $SMUGIN - SMUGOUT > 0 \Rightarrow SMUGIN > SMUGOUT$, thus Vietnam experiences a net cigarette inflow.

If $D < 0$, $SMUGIN - SMUGOUT < 0 \Rightarrow SMUGIN < SMUGOUT$, thus Vietnam experiences a net cigarette outflow.

Thus, the estimated discrepancy (D) will be the net cigarettes smuggled into Vietnam, equivalent to the difference between the quantity of cigarettes smuggled into Vietnam, and that smuggled out of Vietnam.

Data on the quantity of domestically-produced and then domestically-sold cigarettes (equivalent to Domestic Cigarettes Manufactured minus Export), as well as Cigarettes Legally Imported will be obtained from Vietnam Steering Committee on Smoking and Health (Vinacosh) and Vietnam General Custom Office.

Domestic Cigarettes Consumed figures will be estimated as follow:

$$\text{Domestic Cigarettes Consumed in a year} = \text{Average Number of Smoked Cigarettes per day} \times 365 \text{ days} \times \text{Number of Smokers}$$

(5)

In which:

$$\text{Number of Smokers} = \text{Cigarette Smoking Prevalence by gender/age group} \times \text{Population by corresponding categories}$$

(6)

Cigarette Smoking Prevalence and *The Average Number of Smoked Cigarette per day* by gender and age group (15-24, 25-34, 35-44, 45-54, 55-64, and 65+) in 2010 and 2015 were calculated from GATS 2010 and GATS 2015.

GATS is a nationally representative household survey of adults from 15 years of age using a standard core questionnaire, sample design, as well as data collection and management procedures that are reviewed and approved by international experts. GATS was first implemented in Vietnam in 2010 and the survey was repeated in 2015. The surveys were conducted by MoH in cooperation with Ha Noi Medical University and the General Statistics Office (GSO) of Vietnam. Both surveys used a two-tiered stratified random sampling technique

to generate nationally representative data sets. A total of 9,925 individual interviews were conducted in the 2010 census, reaching a response rate of 92.8%. In 2015 there were 8,996 individual interviews conducted, reaching a response rate of 95.8%. In the 2010 and 2015 GATS, the question used to estimate smoking prevalence is ‘*Do you currently smoke tobacco on a daily basis, less than daily or not at all?*’ Smokers are those who responded “daily” or “less than daily.” Regular smokers are those who say “daily,” and occasional smokers are those who reply, “less than daily.” The question, “*On average, how many of the following products do you currently smoke each day?*” is used to identify the average number of sticks smoked daily. Based on these questions and the respondent’s gender and age, the smoking prevalence of regular and occasional smokers by gender and age in 2010 and 2015 can be estimated. Only smoking prevalence for people from 15 years old and older was obtained from these surveys.

Population, by age group and gender, was calculated from the Statistical Yearbook by the GSO.

As GATS 2010 and 2015 only allowed the research team to have national data for two years, the research team needed to calculate smoking rates by age group for 2011, 2012, 2013, 2014, and 2016 using the Small Area Estimation (SAE) method combining GATS, as well as the Labor Force Survey (LFS). The SAE method is more widely used in poverty rate estimations, but can also be applied for estimating smoking rates for men and women at provincial and national levels. This method was applied in Berkowitz et al., (2016) and Lin et al., (2016).

Generalizing the data from GATS, various factors are estimated (such as sex, age, educational level, working status, working sector, household income, and expenditure), which possibly affect smoking probability, or the average number of smoked cigarettes of person i at location j using a logistic model as follows:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad (7)$$

In which: P_i is the probability for person i to be a smoker; X_1, X_2, \dots, X_k are independent variables representing person i ’s characteristics.

With the data from GATS, coefficients for X_i are estimated. For each observation, the value of P_i will be calculated as follows:

$$P_i = \frac{1}{1 + e^{-Z_i}} = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k)}} \quad (8)$$

As mentioned, data on smoking rates in 2011, 2012, 2013, 2014, and 2016 were not available to the research team. As such, to estimate a smoking rate for these years, the team uses the estimated coefficients of the above logistic model along with respective characteristics collected from the LFS, which was a national sample for provinces and the country. Using this dataset helps estimate P_i for each observation from the LFS, which in turn helps estimate smoking rates at provincial and national levels.

The Average Number of sticks smoked per day calculated from GATS 2010 was applied to years 2011, 2012, and 2013. The numbers calculated from GATS 2015 were applied to years 2014 and 2016, assuming that smoking intensity stays constant during the years.

Due to the well-known understatement of the quantity of tobacco consumed by respondents, adjustments should be made to ensure that the estimated tobacco consumption is accurate. Based on the previous study implemented by Nguyen et al., (2014), the under-reporting rates of 10%, 20%, and 30% will be applied to sensitivity analysis.

Table 1. Sources of Data for Estimations

Indicators needing to be estimated/data	Sources
Method 1	
The average sticks smoked per day	Ministry of Health (GATS data 2010, 2015)
Smoking prevalence 2010, 2015	Ministry of Health (GATS data 2010, 2015)
Cigarette Domestic Sale (Tax-paid sale)	Vietnam Tobacco Union and Vinacosh
Cigarette import	Vietnam Tobacco Association and General Department of Custom
Population characteristics	General Statistic Office (GSO)

IV. ESTIMATION RESULTS

The ‘gap’ method, which compares cigarette consumption and tax-paid domestic sales in each year from 2010 to 2016, showed interesting and unexpected results. The discrepancies between these two figures were negative. This result implies that Vietnam is a net supplier, rather than a net recipient of illicit cigarettes. This could mean that cigarettes are smuggled out of Vietnam or that the survey suffers from underreporting.

Table 2 presents the results with several different underreporting assumptions. With no underreporting, the total cigarette consumption increased from 2,712 million packs in 2010 to 2,927 million packs in 2011 and remained nearly unchanged from 2011 to 2016. Cigarette domestic tax-paid sales generally rose throughout the period from 3,986 million packs in 2010 to 5,067 million packs in 2016. The estimated results of tobacco consumption in 2010 were slightly higher than those estimated from the previous study by Nguyen et al., (2014). The difference can be attributed to this estimate including the total cigarette consumption of regular and irregular smokers, while Nguyen et al., (2014) estimated cigarette consumption by regular smokers only.

Table 2. Estimated Consumption, Domestic Tax-paid Sale and Discrepancies, 2010-2016*Million packs*

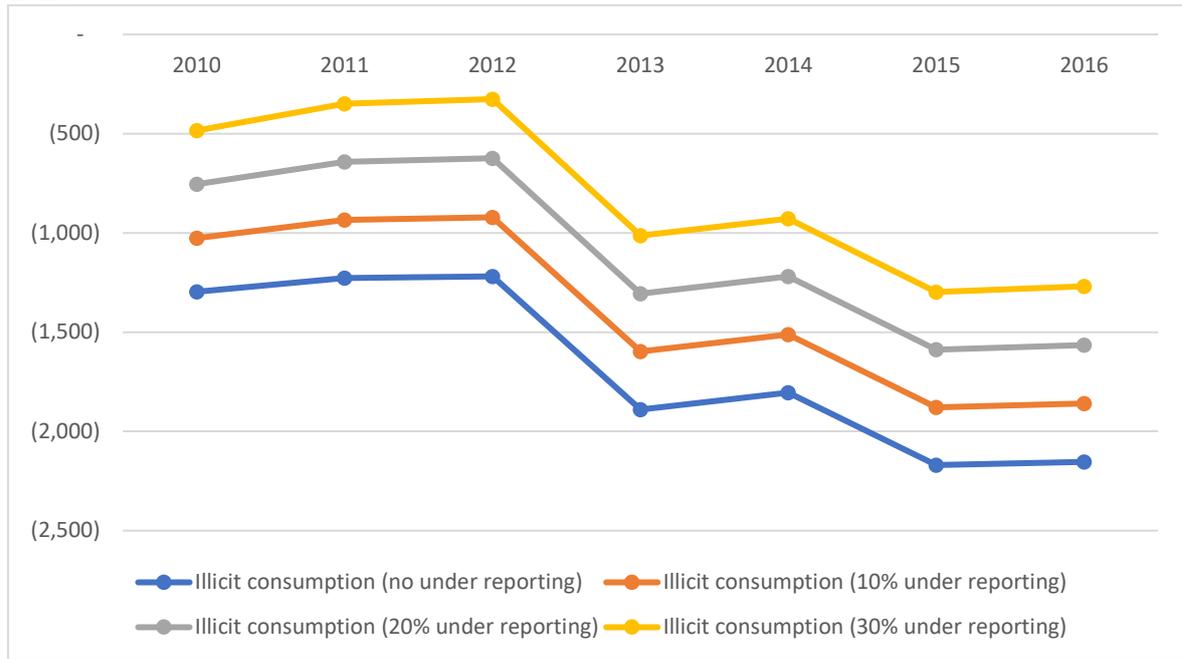
Measure	2010	2011	2012	2013	2014	2015	2016
Estimated consumption	2,712	2,927	2,977	2,919	2,926	2,907	2,948
Domestic Tax-paid sale ¹	3,986	4,131	4174	4,786	4,709	5,044	5,067
Import ²	22.3	22.3	22.3	22.3	22.3	32.1	34.7
Illicit consumption (no under reporting)	(1,297)	(1,227)	(1,219)	(1,889)	(1,805)	(2,170)	(2,154)
Illicit consumption (10% under reporting)	(1,026)	(934)	(921)	(1,598)	(1,512)	(1,879)	(1,859)
Illicit consumption (20% under reporting)	(754)	(641)	(623)	(1,306)	(1,220)	(1,588)	(1,564)
Illicit consumption (30% under reporting)	(483)	(349)	(326)	(1,014)	(927)	(1,298)	(1,270)
Illicit consumption as share of total consumption (10%)	-37.8%	-31.9%	-30.9%	-54.7%	-51.7%	-64.6%	-63.1%
Illicit consumption as share of total consumption (20%)	-27.8%	-21.9%	-20.9%	-44.7%	-41.7%	-54.6%	-53.1%
Illicit consumption as share of total consumption (30%)	-17.8%	-11.9%	-10.9%	-34.7%	-31.7%	-44.6%	-43.1%

Source: Data for 2010, 2011 and 2012 were extracted from a public report by VINATABA “*Domestic consumption of cigarette*” was from <https://tuoitre.vn/2012-viet-nam-tieu-thu-4174-ti-bao-thuoc-la-575893.htm>; Data for 2013-2016 were extracted from the report of Tobacco Control Fund (Vinacosh)

The negative values for discrepancies between total cigarette consumption and tax-paid domestic sale indicate that the number of cigarettes smuggled into Vietnam was smaller than the number smuggled out of Vietnam; or Vietnam experienced a net outflow of illicit cigarettes from 2010 to 2016. The magnitude of illicit cigarette net outflow fluctuated with an increasing trend. This figure ranges from 326 million packs to 1,298 million packs, comprising from 10.9% to 44.6% of total consumption from 2010 through 2016, if respondent under-reporting is assumed to be 30% (Table 2).

Figure 1 shows the trend in the gap analysis with all three underreporting scenarios and shows the increasing negative gap over time.

Figure 1. Consumption of Illicit cigarette Trend - Different Assumed Scenarios, 2010-2016



V. DISCUSSION AND CONCLUSION

The results of this research indicate that Vietnam has a negative volume of illicit trade. This means that there is a net illicit outflow from Vietnam, for example, due to net smuggling out of the country due to tax-paid products produced in Vietnam being smuggled to other countries. This interpretation would mean that in 2010, between 483 million and 1,297 million packs may have been legally produced, taxed, and then transported to other countries. These figures ranged from 1,270 million to 2,154 million in 2016. Since exported cigarettes are not subject to taxes, Vietnamese cigarette exporters had no incentive to underreport their exports, and this is an unlikely scenario. An alternative hypothesis is that the surveys used suffer from underreporting of tobacco use, either smoking prevalence or smoking intensity, or both.

Several critiques of the gap analysis method have indicated that this method is a poor method at estimating the level of illicit trade in any given particular year due to challenges with underreporting in surveys, but that the method is best utilized to analyze the trend in illicit trade over time. The results of this survey show that negative magnitude of illicit trade increased significantly over time. The interpretation of this result is, illicit trade showed a declining trend over time.

In 2016, excise tax rates levied on domestically manufactured cigarettes were increased from 65% to 70% of wholesale prices. Based on the tobacco industry narratives, the number of cigarettes smuggled into Vietnam was expected to rise due to the increase. However, our estimation indicates that Vietnam still experienced a net smuggling out in 2016, and that net

smuggling out had increased since 2010. There is no evidence to establish a relationship between a tax increase and illicit cigarette consumption. Furthermore, by showing an increasing trend in the negative gap over time, the results clearly show that increases in excise taxes did not result in increases in tax avoidance and evasion over time.

The apparent decline in illicit trade that coincided with the tax increase may reflect better enforcement, or that increased domestic prices may have reduced the price differential between domestic and illicitly imported cigarettes. Unusually, illicit cigarettes in Vietnam are more expensive than tax-paid cigarettes (Nguyen et al., 2014). Thus increasing domestic prices would reduce this price differential thereby shifting consumption from illicitly imported to domestic tax-paid cigarettes.

Vietnam's present situation, of low prices on domestic cigarettes, creates favorable conditions for cigarette smugglers and provides easy access to illicit cigarettes for the Vietnamese people; but the absence of a relationship between tax changes and smuggling suggests that potential increases in the excise tax should not be discouraged by the threat of an increase in illicit trade.

The government should increase taxes on cigarettes to raise domestic cigarette prices and take strong anti-corruption measures to create a more transparent social environment, therefore effectively reducing the prevalence of illicit cigarettes in Vietnam.

Although this research could provide some evidence to confirm similar findings from previous studies, the comparison has some limitations, mainly due to the available data. As the authors must apply the SAE method for estimating smoking rates for various population groups in terms of age and sex, important factors would be missing which might also affect smoking situations. For instance, the authors did not know whether grandparents, parents or other close relatives of the observed people were also smokers, or what the sources were for tax-paid cigarettes. Moreover, the SAE method depends heavily on weighted estimates as this method needs to consider proportions of certain groups of people.

The estimates measure the magnitude of illicit cigarettes present in the market, but could not distinguish whether these cigarettes originated domestically or abroad. Last but not least, the authors could not take into account a number of other factors which might also strongly affect illicit trade. For example, along with increased tax, law enforcement as well as public education might be good policy actions to decrease tobacco use, curb contraband tobacco, and increase tobacco tax revenue.

Despite these limitations there has been no increase in illicit trade as a result of tax increases. Given Vietnam's low tax rates and high level of tobacco use, illicit trade is not an impediment to increasing tobacco taxes further.

REFERENCES

- Berkowitz, Z., Xingyou Zhang, Thomas B. Richards, Lucy Peipins, S. Jane Henley, and James Holt. (2016). "Multilevel Small-Area Estimation of Multiple Cigarette Smoking Status Categories Using the 2012 Behavioral Risk Factor Surveillance System", *Cancer Epidemiol Biomarkers Prev*; 25(10) October 2016.
- Blecher, E., (2010). "A mountain or a molehill: Is the illicit trade in cigarettes undermining tobacco control policy in South Africa?", *Trends Organ Crim* 13:299-315.
- Blecher and Le Thi Thu (2018). "Vietnam Country Factsheet: Tobacco Tax Structures." Chicago: Tobacconomics.
- Health Canada. (2007). "RCMP 2008 contraband tobacco enforcement strategy"
- HM Revenue & Customs. (2017). "Measuring tax gaps 2017 edition - Tobacco tax gap estimates for 2016-17".
- International Agency for Research on Cancer. (2011). *IARC Handbooks of Cancer Prevention, Tobacco Control, Vol. 14: Effectiveness of Tax and Price Policies for Tobacco Control*. Lyon, France: IARC
- Joossens, L., Merriman, D., Ross, H., and Raw, M. (2010). "The impact of eliminating the global illicit cigarette trade on health and revenue." *Addiction*, 105(9), 1640-1649.
- Levy DT, Bales S, Lam NT, and Nikolayev L. (2006). "The Role of Public Policies in Reducing Tobacco: Policy Simulation Model." *Soc Sci Med* 62: 1819-1830.
- Mathers, CD, Loncar D. (2006). "Projection of Global Mortality and Burden of Disease from 2002 to 2033". *PloS Med* 3 (11): e442
- Medvedeva, N. (2016). "VINATABA vs. Illicit Trade". Access on 23 March 2018 at <https://www.tobaccoasia.com/features/vinataba-vs-illicit-trade/>

National Research Council, 2015. *Understanding the U.S. Illicit Tobacco Market: Characteristics, Policy Context, and Lessons from International Experiences*. Washington, DC: The National Academies Press.

National Research Council (NRC) and Institute of Medicine (IOM). “Understanding the U.S. illicit tobacco market: characteristics, policy context, and lessons from international experiences. Committee on the Illicit Tobacco Market: Collection and Analysis of the International Experience. Reuter P, Majmundar M, editors. Committee on Law and Justice, Division of Behavioral and Social Sciences and Education and Board on Population Health and Public Health Practice, Institute of Medicine. Washington, DC: National Academies Press; 2015.

Nguyen MT, Denniston R, Nguyen HTT, Hoang TA, Ross H, et al. (2014) The Empirical Analysis of Cigarette Tax Avoidance and Illicit Trade in Vietnam, 1998-2010. PLoS ONE 9(1): e87272.

Nguyen MT, Dao ST, Nguyen NQ, Bowling M, Ross H, So AD (2019) Illicit Cigarette Consumption and Government Revenue Loss in Vietnam: Evidence from a Primary Data Approach.

Oxford Economics. (2018). “Asia Illicit Tobacco Indicator 2017: Vietnam”. Oxford: Oxford Economics

Ross, H., (2015). “Understanding and measuring tax avoidance and evasion: A methodological guide.” Prepared for the Economics of Tobacco Control Project, School of Economics, University of Cape Town and Tobacconomics, Health Policy Center, Institute for Health Research and Policy, University of Illinois at Chicago.

Schwartz, R., and B. Zhang. (2015). “Does Increasing Tobacco Tax Increase Contraband? Debunking the Taxation-Contraband Tobacco Myth”. Presentation at Ontario Tobacco Research Unit Webinar on 12 May 2015.

Song L, Mercer L, Wakefield J, Laurent A, Solet D. (2016) “Using Small-Area Estimation to Calculate the Prevalence of Smoking by Subcounty Geographic Areas in King County, Washington, Behavioral Risk Factor Surveillance System, 2009–2013”. *Prev Chronic Dis.* 13:150536.

U.S. Department of the Treasury. (2010). “Federal Tobacco Receipts Lost Due To Illicit Trade and Recommendations for Increased Enforcement.”

Titeca K, Joossens L, and Raw M. (2011). “Blood cigarettes: cigarette smuggling and war economies in central and eastern Africa,” *Tobacco Control* 2011; 20:226-232.

Vinataba Newsletter (2019), the fight against cigarette smuggling: reveal many difficulties, http://www.vinataba.com.vn/App_File/userfiles/files/Thu%E1%BB%91c%201%C3%A1%20s%E1%BB%91%201%20-%202019.pdf

World Health Organization (WHO) (2008) WHO report on the global tobacco epidemic 2008. Geneva: World Health Organization.

World Health Organization (WHO) (2013) Protocol to Eliminate Illicit Trade in Tobacco Products. Geneva: World Health Organization.

World Health Organization (WHO) (2017) WHO report on the global tobacco epidemic 2017. Geneva: World Health Organization.