Impact of Excise Tax on Reducing Tobacco Consumption – The Case of Vietnam

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ABSTRACT: With rising tobacco consumption around the world, particularly in Vietnam. The essay examined and evaluated the excise duty on cigarettes in Vietnam. Moreover, the author developed a research model based on elements influencing tobacco consumption behavior, such as GDP, population, inflation, and excise tax rates. Besides, the authors discovered shortcomings in the current Vietnamese tax system after reviewing documents and data, such as the tax rate being too low in comparison to people's income and the taxable price being currently factory pricing. As a result, the essay provides important ideas for pushing the reform of Vietnam's tobacco excise tax policy in the next few years.

KEYWORDS: excise tax rate, tobacco consumption, Vietnam, behavior, recommendation

I. INTRODUCTION

Increasing tobacco taxes has been shown to be the most effective way to reduce tobacco consumption. According to the data of the World Health Organization (WHO) calculated in 2013, the number of people reducing smoking will decrease to 49 million people if countries increase the excise tax on a pack of cigarettes to 50%. It also reduces at least 11 million smoking-related deaths, and this pattern has been observed in many different regions (World Health, 2021). According to WHO research, on average, increasing tobacco taxes at the same time will increase the price of cigarettes by about 10% as well as a 4% reduction in smoking in high-income countries and about 5% in low-income countries. Besides, WHO points out that the global leader in increasing tobacco taxes and achieving positive results is the European region in the years close to 2013 (World health, 2021). In countries around the world, from 1995 to 2005, France introduced several price increases and taxes. Since then, the death rate from lung cancer for men aged 35 to 44 has dropped significantly. In addition, in 2008, the excise tax in Turkey increased to 84.2%, and some policies such as a ban on indoor smoking and tobacco advertising. This resulted in a 13% reduction in smoking rates between 2008 and 2012 (World Health, 2021). In fact, in 2018 only 38 countries (14% of the global population) taxed tobacco as high. To improve smoking, in late 2016 Colombia included the tobacco tax increase in a major financial reform. Specifically, the tax rate on cigarettes tripled from 2016 to 2018. Not only did tobacco consumption fall by 34% in 2018, but excise tax revenue was earmarked to fund Universal health coverage (UHC) has nearly doubled. Thus, tobacco tax reform has not only reduced tobacco consumption but also contributed to the financial sustainability of the UHC system (Marquez, 2019). With the support of WHO, in 2012, Gambia's national revenue in 2018 tripled in 2011 due to the planned increase in cigarette prices, while imports of cigarettes decreased by 34% (Marquez, 2019).

Not only in many countries around the world but also many studies show that in Vietnam, adult men account for 50% of smokers, women only about 2%. Moreover, passive exposure to secondhand smoke at home and in public places is quite high, with an estimated 40,000 deaths due to tobacco-related diseases (Marquez, 2019). In Vietnam, the excise tax on drugs is only 28% of the price of the most popular brand compared to China (36%) and Malaysia (47%), because the target is too low compared to the 70% WHO recommendation Vietnam is one of the cheapest countries to sell cigarettes in the world (Marquez, 2019). Additionally, millions of dollars in losses and reduced productivity each year due to tobacco-related diseases. In 2008, after applying the tax rate of 65%, tobacco sales increased to more than 1 trillion VND, while tobacco consumption decreased by 8% compared to 2007. However, in 2009, tobacco consumption again increased by 10% and increased in the following years. After the introduction of a new tax rate of 70% in 2016, the tobacco tax had an increase of about 1.25 trillion in revenue compared to 2015 but because of the small tax increase, consumption was also small (World Health, 2020). In a study by the Institute of Public Policy and Management under the National Economics University in 2014 on the impact of tax increases on

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employment and production of the Vietnamese economy, the total number of jobs increased by 0.12 % and total output will increased by 0.09% if the government increases taxes by 65% to 85% (World health, 2020). Therefore, increasing the tobacco excise tax is a win-win solution: public health and the state budget both benefit.

II. LITERATURE REVIEW

Based on the research of Bauer et al (2007), Push et al (2019), Dilley et al (2012), and related studies, it has identified and proposed 4 main factors affecting tobacco consumption behavior including GDP per capita, population, inflation, and excise tax.

A. GDP Per Capita

GDP per capita is calculated by dividing the total gross value contributed by every producer residing in the country's economy plus any taxes on goods not included in output assessment by the midyear population (Worldbank, 2023). Spending by consumers, which comprises the items and services purchased by households, reflects changes in GDP. Furthermore, changes in consumer behavior, such as spending patterns, have a major impact on GDP per capita. For instance, during a period of recession, customers may reduce their spending, resulting in a fall in average income. Buyers might boost purchasing during times of economic growth since economic growth results in an increase in GDP. In terms of GDP, Australia's average negative GDP growth during deep recessions from 1960 to 2010 was 2.6%, while durable luxury goods consumption averaged 5.7% year on year, with durable basic goods remaining stable with a 0.6% positive gain (Brien, 2019). As a result, GDP growth has been demonstrated to influence consumer purchase behavior, with needs taking precedence over discretionary items (Black et al, 2012).

B. Population

Personal and household behavior can be influenced by demographic variables such as age, gender, income, and education level, hence population and consumer behavior are inextricably linked. Population growth and shifts in demographics can influence consumer behavior by influencing the size and makeup of the market for items and services (Easley et al, 2019). An elderly population, for instance, may have different spending patterns than a younger one because they might have distinct needs and interests. Behavioral economics depicts the effect of a data layer, in which customers are impacted by the choices and actions of others (Easley et al, 2019). Moreover, the "experience of scarcity" plays a larger part in establishing consumer anxieties in everyday life, such as basic banal things whose value is frequently exaggerated due to surging demand (Cheung et al 2015). Yoon et al (2017) discovered that when Australia's rice output decreased 98% during the 2008 drought, clients in Vietnam, India, and Hong Kong began stockpiling rice owing to concerns about limited future supplies. With these buyer habits and the increasing scarcity of these things, driven by irrational herd mentality paired with panic buying, the impacted economy's economic troubles are worsening. This is also due to the enormous influence of population growth, which causes each individual's consuming habit to be influenced by others around them.

C. Inflation

Inflation is defined as an increase in prices that results in a decrease in buying power over time (Fernando, 2023). The average price increase of a given basket of items and services over an extended period may indicate a rate of reduction in buying power. According to Schuler (2023), inflation has a major impact on consumer behavior. Many of the consequences of inflation on consumer behavior are comparable across inflationary periods. Another study stated that inflation expectations have a large beneficial impact on both non-durable goods and service expenditures in the near run; nevertheless, the same circumstance has an adverse effect on durable products (Abaidoo, 2016). More importantly, this present investigation discovers that, contrary to expectations for inflation, unpredictability in economic policy tends to restrain consumer cost at all micro levels, with very large variances in a drop in expenditures produced.

D. Excise tax rate

The excise tax rate is regarded as an indirect tax, mostly levied by government agencies on expensive items or services that have a significant environmental or health effect, such as fuel, tobacco, and alcohol (Kagan, 2023). The excise tax will be levied at varied rates based on the specifics of each nation, and may even vary by region. In reality, cigarette and alcohol usage has become a major public health issue in many countries. The imposition of excise taxes discourages the consumption of certain commodities, decreasing the effect on residents (Chaloupka et al, 2019). This tax originally had the goal to generate income for the government's budget; nevertheless, it has now been linked to a reduction in the buying power of individuals for health-related commodities (Chaloupka et al, 2019). However, imposing a tax might have certain unfavorable side effects, such as diminishing the income of individuals selling the taxed goods or raising consumer expenses if prices rise substantially. As a result,

the design and implementation of taxes must be done with care to ensure that their impact is constructive and that stakeholders' interests are protected.

III. RESEARCH METHODOLOGY

A. Hypotheses development

3.1. GDP per capita and tobacco consumer behavior: One of the prominent factors affecting tobacco consumption in countries is the income per capita (GDP). According to Chauvin et al (2004), this study shows that groups of people living in areas with high GDP levels have higher rates of tobacco consumption than areas with low GDP levels. In addition, a meta-study of factors such as income, and household assets, also shows that people with good financial ability, often find it harder to quit smoking than those without a job, including students or the unemployed (Thomson et al, 2019). An evidence-based study by Jha (2020) indicates that the earliest cause of death in countries with high GDP is smoking, notably with 41 million deaths in the United States, United Kingdom, and Canada, from 1960 to 2020. In addition, this study also shows that adult smoking rates in high-income countries have decreased significantly, but smoking is still common in these countries. Contrary to the above studies, according to Bauer et al (2007), based on their research in Germany, people with lower incomes are said to be more likely to smoke compared to rich people. Perhaps, this could be because people with higher incomes tend to value their health more because they can have more healthy time in the future to be productive. However, it is likely that people with high incomes will have to work with a higher frequency, which leads to them being constantly under pressure, which in turn will lead to smoking.

H1: The GDP per capita has a negative impact on tobacco consumption behavior.

3.2. Population and tobacco consumer behavior: Tobacco consumption behavior was intimately related to population factors. Variations in demographics and population variables have also been shown to have significant effects on the use of cigarettes, cigars, and other medicines (Ganz et al, 2022). Tobacco use behavior differs significantly by gender features of the population. Based on an investigation conducted by Dr. Mehrshad Abassi et al in 2007 with the Iranian population aged 15-64, the average daily smoking rate was 11.3% (5.6 million: 21.4% men and 1.4% women), those who smoke make up 1.7 million or 3.4% of the Iranian population (Meysamie et al, 2010). In accordance with previous research, the prevalence of smoking among young people aged 15 and older in Vietnam is 22.5% of the overall population, 45.3% of men, and 1.1% of women, based to data collected by the Global Survey on Adult Tobacco GATS in 2015 (Hoang et al, 2017). The unifying element of the foregoing data is that the proportion of adult men who smoke is significantly greater than that of women. Additionally, Corey et al (2014) said that the cigarette consumption habit of young and middle-aged persons is more prevalent than that of the elderly. According to the World Bank (2020), a majority of nations with older people have lower smoking rates than those with a young population.

H2: The population has a positive impact on tobacco consumption behavior

3.3. Inflation and tobacco consumer behavior: In reality, inflation has an effect on people's cigarette consumption behavior because it affects economic conditions and personal collection. According to Dilley et al (2012), a rise in cigarette pricing in Washington may have no effect on smoking habit since inflation decreases costs while prices are fixed. In particular, while the median price of a pack of smokes climbed by 1.91 USD between 2000 and 2008, after taking into account inflation, the rise was just 0.63 USD. Moreover, based on Guindon et al (2017)'s research in Argentina, the price has no effect on smoking behavior throughout times of high inflation into extremely high inflation. In this case, the price has no significance at these times. Furthermore, inflation-adjusted cigarette prices and taxes reduce people's attraction and the number of days they consume tobacco (Kierstead et al, 2023). This demonstrates that in order to retain the effect, the price of cigarettes must be raised consistently and on a regular basis to compensate for inflation. To diminish the purchasing power of individuals, authorities must ensure that cigarette taxes are automatically adjusted to fluctuations in inflation, as in Korea and the Russian Federation (Linh Dan, 2022; World Bank, 2018).

H3: Inflation has a positive impact on tobacco consumption behavior.

3.4. Excise tax rate and tobacco consumer behavior: Actually, excise taxes are directly tied to the prices of commodities such as cigarettes, therefore raising taxes will raise the price of cigarettes. In accordance with a study conducted in Australia by Push et al (2019), increasing tobacco pricing or taxes on tobacco is not only an effective tobacco control approach for reducing smoking rates in the general population but it may also be used to eliminate social disparities in smoking. This study discovered that smoking rates in Australia declined from 28.2% to 19.7% between January 1991 and December 2006, while costs increased from 3.39 USD to 11.60 USD. Price hikes are the most effective method of reducing smokers and tobacco consumption (Phan, 2015). The greater the price of tobacco products, the more likely it is to deter people who do not smoke from taking up smoking, aid in avoiding the development of addiction, and possibly urge current smokers to quit or reduce their consumption. Moreover,

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Jimenez-Ruiz et al. (2008) found that price is a major determinant in household choices about smoking and the number of cigarettes. Tobacco excise tax increases lead to higher prices, contributing to a fall in the percentage of smoking families. After assessing the evidence, the World Bank concluded in 1999 that a 10% average price increase would reduce demand for tobacco products by around 4% in high-income countries and approximately 8% in low- and middle-income countries (Fuchs, 2019). Many research has also looked into the effect of price fluctuations on tobacco product substitution and discovered that shifts in tobacco pricing are highly related to excise taxes.

H4: The excise tax has a negative impact on tobacco consumption behavior.

B. Data collection method

To evaluate the factors affecting tobacco consumption behavior in Vietnam, with independent variables such as GDP, population, inflation, excise tax, or dependent variable tobacco consumption behavior. The researchers used panel data over a 23-year period from 2000 to 2022 with nine representative countries with different economic levels to clearly see the effects of the factors. Besides, the collected data is based on reliable sources such as GSO, World Bank, OEDC, Statista, and google scholar.

C. Research Model

There are four hypotheses put forward for the analysis based on the upper resistance muscles. Among the variables that affect the consumption behavior of customers are independent variables including GDP per capita, population, inflation and excise tax rate. In addition, the dependent variable is the customer's consumption behavior because it is influenced and explained by the above independent variables. With the goal of clearly analyzing the effects of the above independent variables on the dependent variable, the authors decided to use OLS, FEM, REM, and FGLS models on Stata software. Based on the above analysis, the research model proposed by the authors:
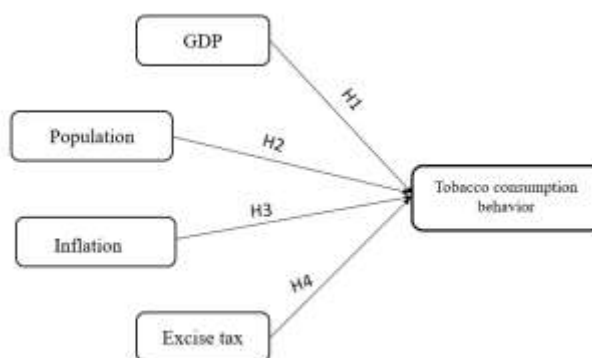
Figure 1. Model of factors affecting tobacco consumption behavior in Vietnam

The equation of the model is described:

TCBd = GDPi + Populi + Infli + Taxi

Note:

Name Variables	Meaning	Units	Examined hypothesizes	The expected result of Coefficient Bata
TCBd	Tobacco consumption behavior	Million packs	Dependent variable	
GDPi	GDP	USD	H1: The relationship between the GDP and tobacco consumption behavior is negative	-
Populi	Population	Million people	H2: The relationship between the population and tobacco consumption behavior is positive	+
Infli	Inflation	%	H3: The relationship between inflation and tobacco consumption behavior is positive	+
Taxi	Excise tax	%	H4: The relationship between the excise tax and tobacco consumption behavior is negative	

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IV. FINDINGS AND DISCUSSION

A. Result

Variable	Obs	Mean	Std. dev.	Min	Max
tcbd	207	2738.094	1428.402	400	5500
gdpi	207	19196.03	18271.37	394.6	57879
populi	207	88.88785	62.84059	15.93	275.5
infli	207	4.639758	8.777186	-1.7	80
taxi	207	61.0913	17.48462	25	90

Source: Calculating result from Stata

Figure 2. Descriptive statistics

	gdpi	populi	infli	taxi
gdpi	1.0000			
populi	-0.5698	1.0000		
infli	-0.2149	0.0487	1.0000	
taxi	-0.0346	-0.3631	0.0710	1.0000

Source: Calculating result from Stata

Figure 3. Correlation between variables

Looking at the above figure 2 can be seen that each variable has 207 observations recorded. Coming to figure 3 shows that the correlation between variables is very reasonable when all are less than 0.5.

Source	SS	df	MS			
				Number of obs	=	207
				F(4, 202)	=	20.58
Model	121696012	4	30424002.9	Prob > F	=	0.0000
Residual	298612613	202	1478280.26	R-squared	=	0.2895
				Adj R-squared	=	0.2755
Total	420308625	206	2040333.13	Root MSE	=	1215.8

tcbd	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
gdpi	-.033459	.0060803	-5.50	0.000	-.045448	-.02147
populi	-4.832555	1.858671	-2.60	0.010	-8.497441	-1.167669
infli	56.48689	9.927395	5.69	0.000	36.91228	76.06151
taxi	-6.53958	5.481269	-1.19	0.234	-17.34742	4.268262
_cons	3947.356	513.6685	7.68	0.000	2934.516	4960.196

Source: Calculating result from Stata

Figure 4. OLS regression

To evaluate each relationship between the dependent variable and the independent variable, the researcher used the OLS regression model. In this model, Prob > F = 0.0000, so the P-value is understood to be less than 0.05, and R-squared = 0.2895, so the result is:

- The relationship between GDP and the tobacco consumption behavior of Vietnam is significant and negative when P>|t| = 0.000 < 0.05. Therefore, the level of GDP per capita has a 28.95% influence on the tobacco consumption behavior of Vietnam.
- The relationship between the population and tobacco consumption behavior of Vietnam is significant and negative when P>|t| = 0.010 < 0.05. Therefore, the population has a 28.95% influence on tobacco consumption behavior in Vietnam.
- The relationship between inflation and tobacco consumption behavior in Vietnam is significant and positive when P>|t| = 0.000 < 0.05. Therefore, inflation has a 28.95% influence on tobacco consumption behavior in Vietnam.
- The relationship between excise tax and tobacco consumption behavior in Vietnam is not significant and negative when P>|t| = 0.234 > 0.05.

Variable	VIF	1/VIF
populi	1.90	0.526022
gdpi	1.72	0.581427
taxi	1.28	0.781294
infli	1.06	0.945167
Mean VIF	1.49	

Source: Calculating result from Stata

Figure 5. VIF

From the results table of figure 5, the author finds that there is no multicollinearity between the variables because the VIF of the variables is all less than 2. However, when the author checks heteroscedasticity in the OLS model, found Prob > chi2 = 0.0322 < 0.05 (Appendix 1), which means heteroscedasticity. Therefore, the author concludes that the OLS regression model is not suitable for this study.

Next, the author applies FEM and REM models to the study to find out each relationship between the variables. Besides, to find the most suitable model, the researcher used the Hausman technique.

	Coefficients			
	(b) fem	(B) rem	(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
gdpi	-.0396643	-.0379208	-.0017435	.0005405
populi	22.49846	13.54371	8.954754	2.440751
infli	.6176005	.1090223	.5085781	.
taxi	-10.69594	-8.055016	-2.640919	.5349639

b = Consistent under H0 and Ha; obtained from **xtreg**.
B = Inconsistent under Ha, efficient under H0; obtained from **xtreg**.

Test of H0: Difference in coefficients not systematic

$$chi2(4) = (b-B)'[(V\_b-V\_B)^{(-1)}](b-B)$$
$$= 13.86$$

Prob > chi2 = 0.0078
(V_b-V_B is not positive definite)

Source: Calculating result from Stata

Figure 6. Hausman

Based on figure 6, it can be seen that the P-value (Prob>chi2 = 0.0078) is less than 0.05, so the FEM model is the more efficient model. When proceeding to other tests, the author found that even though there was no autocorrelation (Prob>F = 0.1402 > 0.05), heteroscedasticity occurred in the FEM model (Prob>chi2 = 0.0000 < 0.05) (Appendix 2,3). Therefore, this model is also not suitable for the study.

Finally, to overcome the disadvantages of the above models, the author uses FGLS regression.

Cross-sectional time-series FGLS regression

Coefficients: **generalized least squares**
Panels: **heteroskedastic**
Correlation: **no autocorrelation**

Estimated covariances	=	9	Number of obs =	207
Estimated autocorrelations	=	0	Number of groups =	9
Estimated coefficients	=	5	Time periods =	23
			Wald chi2(4) =	142.50
			Prob > chi2 =	0.0000

tcbd	Coefficient	Std. err.	z	P>|z|	[95% conf. interval]	
gdpi	-.0347534	.0038367	-9.06	0.000	-.0422732	-.0272336
populi	-4.628568	1.146415	-4.04	0.000	-6.8755	-2.381637
infli	46.03935	11.47279	4.01	0.000	23.5531	68.5256
taxi	-12.17164	3.355158	-3.63	0.000	-18.74763	-5.595651
_cons	4368.918	301.4472	14.49	0.000	3778.093	4959.744

Source: Calculating result from Stata

Figure 7. FGLS regression

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Concluding that, the FGLS model has overcome the shortcomings of other models, from figure 7 it can be seen that Prob>chi2 = 0.000, so this table will illustrate the relationship between the dependent and independent variables. Here are some important things that can be done:

- The relationship between GDP and tobacco consumption behavior of Vietnam is significant and negative because P>|z| = 0.000 < 0.05 and the value of Coef < 0.
- The relationship between population and tobacco consumption behavior in Vietnam is significant and negative because P>|z| = 0.000 < 0.05 and the value of Coef < 0.
- The relationship between inflation and tobacco consumption behavior in Vietnam is significant and positive because P>|z| = 0.000 < 0.05 and the value of Coef > 0.
- The relationship between excise tax and tobacco consumption behavior in Vietnam is significant and negative because P>|z| = 0.000 < 0.05 and the value of Coef < 0.

B. Discussion

From the results of the FGLS regression model, the researcher concludes that GDP per capita, population, and excise tax have a negative influence on tobacco consumption behavior in Vietnam, while inflation has a positive impact on tobacco consumption behavior in Vietnam.

In fact, it can be seen that GDP and tobacco consumption have a rather complicated relationship. However, a high or low level of GDP per capita will have different effects depending on the country or from different angles. Today, the government or people in countries with high GDP are concerned and put health issues first. Individuals with high income levels often have reasonable spending management, especially products related to daily life, especially health products (Chauvin et al, 2004). Therefore, these individuals will be willing to spend money on services and products that help them reduce stress after work and protect their health instead of smoking. This is very reasonable with the results obtained with the research model because when GDP increases, the rate of tobacco consumption decreases. But many studies in countries with high GDP levels show the opposite, these people are often more likely to be exposed to tobacco advertising than low-income people. Besides, the rapid development of the economy in these countries makes them work continuously leading to smoking to relieve stress quickly (Thomson et al, 2019). In addition, the strong growth of the tobacco industry has spurred the development of luxury tobacco items such as cigars. With prices in Vietnam of around 1 million VND per cigarette or more, these companies have targeted the high-income people's need to express themselves. Next, there is a close relationship between GDP and education as high-income countries always focus on developing education (Minh An et al, 2013). Because individuals live in a healthy environment and understand the importance of health, the number of cigarettes consumed here will be limited. On the other hand, in countries with low GDP, less attention is paid to education. Meanwhile, tobacco corporations often rely on these weaknesses to expand their markets and target customers. Thus, it can be seen that the GDP factor will have different effects on tobacco consumption behavior in Vietnam. However, in general, with the fast GDP per capita growth rate and the increasing awareness, the level of tobacco consumption will be decrease gradually.

Although the model's calculation show that the population has a detrimental impact on cigarette consumption behavior, much research shows the reverse. As can be shown, age is the primary population characteristic that influences tobacco usage behavior. According to a European study, older adults are more prone than younger people to have difficulties stopping for a variety of reasons, including prolonged smoking time, poor intention to quit, and so on (Lugo et al, 2013). However, due to the rapid development of the tobacco industry, particularly the advent of e-cigarettes, the proportion of young people smoking has increased dramatically in several nations. Adults have developing brains and are very susceptible to nicotine, according to Jieming Zhong et al (2016), which predisposes young individuals to dependence and usage of tobacco products. Particularly when the device offers a nicotine dose more acceptable for young people than ordinary cigarettes, the quality of e-cigarettes has increased. In truth, the use of e-cigarettes is becoming more popular in Vietnam's major cities, particularly among those with a high standard of living and young people. According to the 2019 School Health Survey, up to 2.6% of pupils aged 13-17 used e-cigarettes. Teenagers aged 15-17 have a rather high rate of e-cigarette use (3.1%). Male students aged 15-17 had a rate of 4.8%, while female students have a rate of 1.4% (Vuong, 2021). In addition, per the World Bank (2019), men tend to smoke more than women, with three men smoking and 16 women smoking. However, rates of tobacco use among women have been growing in recent years, notably among young people, older people, and pregnant women (Jafari et al, 2021).

The model's results are consistent with the author's initial hypothesis that inflation has a beneficial influence on tobacco consumption in Vietnam. In fact, one of the elements influencing the price of commodities, including cigarettes, is inflation. The findings of Dilley et al. (2012), boosting product costs will not diminish cigarette consumption when inflation rises

correspondingly. Moreover, at times of high and super-high inflation, pricing has lost its significance in limiting tobacco consumption behavior (Guindon et al, 2017). These investigations reveal that, although the high price of cigarettes, they are no longer effective in lowering tobacco usage in the world in general, and in Vietnam in particular, without sufficient inflation correction. Moreover, Aungkulanon et al (2019) states that an average price rise above the current inflation rate can limit the client's rise in tobacco consumption.

The results of the model show that increasing excise tax has a negative effect on tobacco consumption behavior in Vietnam, coefficient = -12.17 means that when excise tax increases by 1 unit, tobacco consumption will be down 12 units. In reality, one of the causes of Vietnam's high tobacco consumption is that the price of cigarettes is too cheap in order to keep pace with people's income levels or inflation, which is tied to the Government's Special consumption tax policy (Dinh, 2023). Adults from various demographic categories and socioeconomic backgrounds are more likely to limit their tobacco usage as cigarette excise tax rates rise (Jaffri et al, 2022). Furthermore, WHO (2023) stated that increasing the excise tax rate on tobacco is one of the most effective and cost-efficient approaches to reducing the number of cigarettes consumed each year. For instance, Thailand has used a tax hike strategy that ranges from 55% to 90% 11 times. As a result of these changes, youth smoking rates in Thailand have dropped from 32% in 1991 to 17.4% in 2021 (Le, 2023). In addition, after adopting the tax increase strategy, the number of cigarettes sold in China was reduced by 3.3%, resulting in an increase of around 11 billion USD in tax income for the Chinese government (WHO, 2016). Consider the Philippines, which raised the excise duty from four tax categories to a single rate of 30 Pesos per pack of cigarettes (Nguyen et al, 2018). According to the author, a rise in excise tax contributes to an increase in the retail price of cigarettes, which helps to prevent first-time tobacco use and people's ability to purchase the product. As a result, limiting tobacco use by an increase in excise tax will help safeguard people's health while also increasing money for the state.

V. RECOMMENDATION

Firstly, considering high tariffs like China and the Philippines is something Vietnam should do, because tobacco prices in Vietnam are low. In fact, the price of cigarettes is cheap because the tobacco tax in Vietnam is the ex-factory tax, not the retail price: meanwhile, the ex-factory price is too low, even if taxed, it does not matter to the retail price. This has increased the access to and purchase of tobacco by young people and low-income people, which has a strong influence on the effectiveness of tobacco control. Although from 2016-2019, the average sales volume of cigarettes has been raised, tobacco consumption in Vietnam has not improved significantly and tends to increase in quantity. Therefore, Vietnam should switch from taxing the factory price to the retail price or the raw materials for making cigarettes, to have a strong influence on the value of cigarette packs before delivering them to consumers. consumption. In addition, the special consumption levels of cigarettes also need to change continuously according to inflation and GDP to ensure the control of people's purchasing power in the same way as Korea did by applying the mixed tax method.

Secondly, on taxable objects: In fact, the excise tax rates for a number of items that have adverse effects on health and society, as well as the regulation for some luxury goods such as cigars, and imported cigarettes are still low, the target of reducing use has not been achieved, especially for high-income users. Or for old and new cigarettes such as waterpipes and e-cigarettes, there are still no clear regulations on tax rates; Meanwhile, pipe tobacco is a popular product widely used from rural to urban areas and all ages, and e-cigarettes are being used widely among young people. In addition, the application of excise tax on tobacco products does not have a great impact on the production process of enterprises but only increases the price of products for the purpose of orienting consumption towards people with high incomes. Therefore, in addition to the National Assembly and the Government, it is necessary to add pipe tobacco products, e-cigarettes, and e-cigarette equipment, parts, and solutions to the list of subjects subject to special consumption. In addition, raising the rate of SCT for the items that are raw materials for the production of the above products is important to further promote the role of SCT in helping to reduce use and improve public health.

Thirdly, to raise awareness of the harmful effects of tobacco: The National Assembly and the Government of Vietnam need to present more positive evidence and coordinate with the media to raise public awareness, especially among young people on this issue. In addition to the establishment of a Law on the Prevention of Tobacco Harm, it is necessary to promote propaganda on the harmful effects of tobacco in the mass media such as coordinating news writing and propaganda articles on tobacco harm prevention through the provincial media channels and on the website of the Department of Health, Center for Disease Control. Thereby, knowledge and awareness about the harmful effects of tobacco and the importance of tobacco prevention to people's health will be enhanced. In addition, the school unions in the area need to focus on propagating and equipping students with basic knowledge about the harmful effects of tobacco, organizing thematic activities, and organizing a competition to learn about the Laws of Tobacco. Preventing and combating the harmful effects of tobacco, etc. Since then,

contributed to raising the awareness and responsibility of young people in building a healthy lifestyle, and joining hands in the prevention and control of the harmful effects of tobacco. The propaganda process also needs to focus on applying information technology and digital transformation to convey information to adolescents in a vivid, fast, and clear way.

Finally, on anti-fraud control and tax declaration: In recent years, solutions to fight, prevent, and handle fraudulent trade activities and tax declaration in the whole country have tended to decrease due to the unpredictable development of the world situation, many potential risks along with the complicated development of the COVID-19 pandemic in the world and in the country. However, after the Government advocated safe adaptation, flexibility, and effective control of the COVID-19 epidemic, production, business, and import and export activities of goods (especially tobacco products)) returns to normal, so commercial fraud and tax declaration fraud tend to increase with more sophisticated methods and tricks. Therefore, the Tax Department needs to strengthen the inspection and examination to prevent tax loss and supervise the tax declaration, tax finalization, and tax refund in order to combat tax fraud on pharmaceutical products. leaves. At the same time, it is necessary to promptly exchange information and closely coordinate with functional forces in the investigation, verification, and handling of smugglers, commercial frauds, and counterfeit goods related to the management of tobacco tax.

APPENDIX

```
Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Assumption: Normal error terms
Variable: Fitted values of tcbd

H0: Constant variance

    chi2(1) =   4.59
Prob > chi2 = 0.0322
```

Appendix 1. Hettest

```
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (9)  =     554.77
Prob>chi2 =     0.0000
```

Appendix 2. Xttest 3

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F( 1,      8) =     2.681
            Prob > F =     0.1402
```

Appendix 3. xtserial

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