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## Structural change in Thailand's tobacco leaf exports: Implications of tobacco control in ASEAN countries

Jirawat Jaroensathapornkul

Faculty of Economics, Srinakharinwirot University, 114 Sukhumvit 23, Bangkok 10110, Thailand.

✉ [jirawatj@m.swu.ac.th](mailto:jirawatj@m.swu.ac.th)

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### ABSTRACT

The purpose of this research is to investigate the implications of tobacco control policies and measure how these have brought about structural changes in Thailand's tobacco leaf exports. The methodology involved employing secondary data to estimate the econometrics model and then utilizing the Chow test. The findings showed that the estimates from the econometrics model reflect the income elasticity of the real export value of 6.621. In the Chow test, a statistically significant (at 0.05) structural change in Thailand's tobacco leaf export was apparent when comparing the results before and after the first quarter of 2010. Furthermore, since 2010 the exports have shifted from the old market to other ASEAN countries, namely Indonesia, the Philippines, Malaysia, and Lao PDR. Concerning the practical implications, from a public health perspective, the results provide evidence for the efficiency of tobacco control policies and measures in European countries, the US, and Australia. On the other hand, they also pinpoint an area of improvement for tobacco control policies in ASEAN countries, and further investigation is required. From an economic perspective, Thai tobacco farmers need to be supported by the government during the transition period.

**Contribution/Originality:** This study contributes empirical evidence about structural changes to tobacco leaf exports in Thailand, which have been redirected to ASEAN countries. It suggests that the tobacco control policies in those countries should be reassessed on a practical level to ensure they are more successful in the future.

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## 1. INTRODUCTION

From 1990 to 2016, tobacco consumption in 19 countries in Europe, North America, and Asia was too high, leading to an increase in healthcare expenditure, as well as rising costs of medical treatment and a higher mortality rate (Aldakhil, Nassani, Abro, & Zaman, 2018). For that reason, governments in these countries implemented policies and measures to control the consumption of tobacco. Moreover, at the end of 2009, the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) was ratified by 168 countries, leading to the further implementation of various policies in line with the WHO FCTC (Sirichotiratana, 2015). The tobacco demand control aspect consisted of price and tax measures; also, these countries have applied non-price measures including the regulation of text on tobacco products, labels, packaging, advertisements, and promotion. At the same time, tobacco

supply control measures, including illicit trade control measures and tobacco crop substitution, proceeded in these countries (World Health Organization, 2003). Apart from this, the Sustainable Development Goals of the United Nations, particularly Target 3.a, focus on the implementation of policies in line with the WHO FCTC in each country (World Health Organization, 2017). In Thailand, the excise tax structure for tobacco products was significantly adjusted on September 16, 2017. However, as of September 30, 2021, it has yet to be officially implemented; therefore, a provisional excise tax structure has been implemented in the interim. The main concept is as follows: in terms of tax per volume, one cigarette pack must be taxed at 1.20 baht per roll. Simultaneously, the percentage tax per value depends on the “Suggested Retail Price,” which means industrialists or importers consider a suggested retail price as a sale price for consumers in general (Excise Department, 2017). The percentage tax is separated into two tiers; firstly, if the suggested retail price of a pack does not exceed 60 baht, it must be taxed at 20% of the retail price. Secondly, if the suggested retail price exceeds 60 baht, the cigarette pack must be taxed at 40% of the retail price. Consequently, the price of imported cigarettes decreased to compete with the price of domestically made cigarettes, and the sale quantity of domestic cigarettes fell drastically. This caused the Tobacco Authority of Thailand (TAOT) to strongly reduce the quota for purchasing tobacco leaves from tobacco farmers.

Jaroensathapornkul (2020) revealed that sample groups of Virginia, Burley, and Turkish tobacco farmers who sell their tobacco leaves exclusively to the TAOT have experienced a statistically significant (at the 0.05 level) decrease in their household incomes. It should be noted that even though Burley farmers in Phetchabun province can sell their tobacco to exporters, their income would still decline because, in 2018 and 2019, Thailand’s value of Burley exports decreased by 10.28% and 42.06%, respectively. Furthermore, Thailand’s value of Burley exports to important trading partners, such as the United States, Belgium, and the Philippines, have vastly decreased by 30.26%, 47.54%, and 70.03%, respectively. Such empirical evidence reveals that the economy of tobacco farmers has been a challenge. Therefore, the Thai government needs a solution to tackle the problems of the transition period (Jaroensathapornkul, 2020).

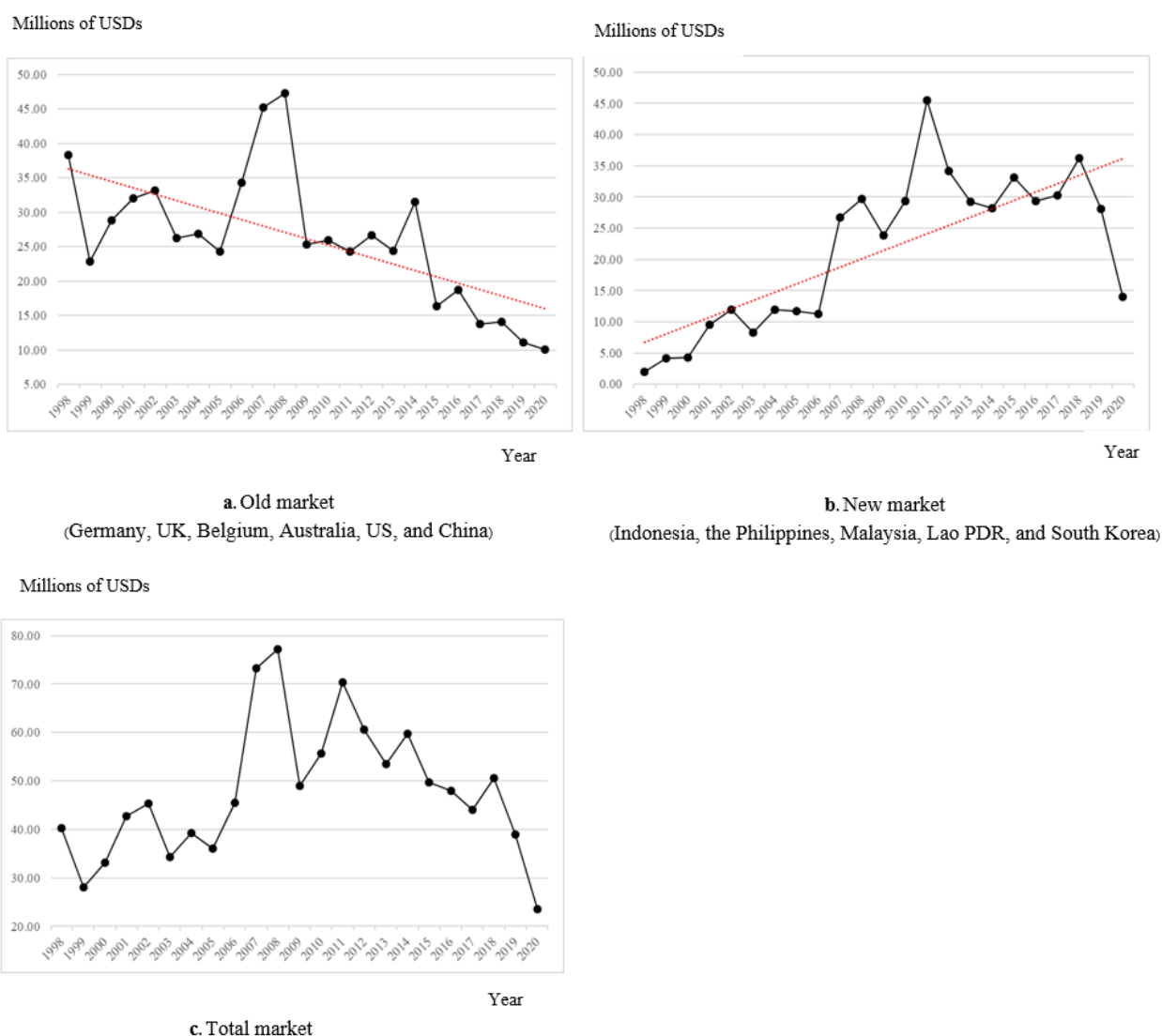


Figure 1. Markets for Thailand's tobacco leaf exports from 1998 to 2020.

Aside from the Burley export issue, the Information Technology and Communication Center of the Ministry of Commerce reports that, over two decades, the value of tobacco exports decreased from 67.59 Million USD in 2000 to 30.48 Million USD in 2020. This factor is important as it creates less competition for Thailand and leads to a higher

cost of tobacco products by allowing a comparison between tobacco exporter countries. Additionally, another contributing factor is the economic growth of the trading partner. The key issue here is that the serious reduction in export values results from the tobacco control policies and measures adopted by Thailand's trading partners. Regarding Thailand's main trading partners, the export values to Germany, the UK, Belgium, Australia, the US, and China show a downward trend from 1998 to 2020 (Figure 1). On the other hand, the export values to Indonesia, the Philippines, Malaysia, Lao PDR, and South Korea show a different pattern. The Association of Southeast Asian Nations (ASEAN) is a 10-nation regional organization that includes Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. Thus it can be said that the new market for Thailand's tobacco leaf exports is ASEAN countries and South Korea. Moreover, the stream has shifted from the old market (Europe, the US, Australia, and China) to the new market, and the export value to the total market from 2008 to 2009 was the turning point (Figure 1). Therefore, this research aims to investigate the implications that the tobacco control policies and measures in line with the WHO FCTC have had for the structural change in Thailand's tobacco leaf exports.

## 2. LITERATURE REVIEW

A decrease in the demand for tobacco worldwide has resulted in a decline in tobacco prices. It has affected tobacco leaf exports in Malawi, Zimbabwe, and Turkey (Diao, Robinson, Thomas, & Wobst, 2002). More specifically, in the case of Malawi—a densely populated country in Africa—the tobacco price shock affected tobacco leaf exports (Bangara & Dunne, 2018). The country's export tariff policy also had an impact on the income of tobacco farmers (Sahn, Van Frausum, & Shively, 1994). However, establishing an association of Burley farmers encouraged the production of Burley, thus increasing the quantity of tobacco leaf sold (Negri & Porto, 2016). Nevertheless, due to the overall reduction in tobacco production, consumer and producer welfare decreased by 3% and 4%, respectively (Kachulu, Rasche, Schnieder, & Chinene, 2018). In the case of Turkey, tobacco leaf exports were strongly sensitive to the real exchange rate; thus, the depreciation of the Turkish lira caused exports to expand (Yanikkaya, Kaya, & Kocturk, 2013).

Among the Asian countries, the main exporters of tobacco are China and India. Over the past fifteen years, tobacco leaf has been an important export product for China. Although the main trading partners or old markets have stagnated, the new markets have strengthened (Li et al., 2018). The volume of tobacco production and export in India is second, after China. From 1987 to 1988 and from 2016 to 2017, India faced much higher competition in the tobacco export industry (Wasnik, Suryawanshi, & Ganvir, 2020). Regarding tobacco consumption, Indonesia is an important market; in 2018, there were 60 million smokers out of a total population of 240 million. Furthermore, Indonesia had the highest number of male smokers and ranked second in the world overall. The government has also not yet ratified WHO FCTC. Apart from this, from 1990 to 2016, although domestic tobacco production was reduced by approximately 20% due to tobacco control policies among the main trading partners, the ratio of imported tobacco to domestic production increased from 17% to 65%. The ratio of imported to exported tobacco products also increased from 0.7% to 65% (Ahsan et al., 2020). The main factors affecting tobacco export from Indonesia to the United States were price and the real GDP of the United States. Nonetheless, Indonesia's exports have little significance in the US tobacco market (Rahmawati, 2013). As for the United States, its Burley production was ranked first in the world. However, in terms of market share, the United States ranked just below Malawi, Italy, and Brazil. The tariff and non-tariff barriers in the United States affected the international trade of Burley (Snell & Reed, 1993). At the same time, tobacco control policies, such as increasing the excise tax and pricing cigarettes, affected the planted area of tobacco (Brown, 1995). In addition, the US Congress restricted the use of the budget from the tobacco export promotion fund (United States Government Accountability, 2019). In the case of Europe, the creation of the European Union led to an increase in international trade, including in tobacco, among its member countries (Zolin & Uprasen, 2018). On the other hand, the Greek oriental tobacco leaf exports from Greece to the United States were strongly sensitive to the volatility of the exchange rate under an agricultural policy (Rezitis & Brown, 1999). Based on this literature review, the expected benefit of our research is to fill in the gap in the literature concerning the relationship between tobacco control policies and tobacco leaf exports, particularly in the case of ASEAN countries. Therefore, the findings of our research can help create a broader knowledge of the tobacco economy for future use in research.

## 3. METHODS AND PROCEDURE

The factors affecting Thailand's tobacco leaf exports used in the econometrics model are derived from the concept of the Gravity Model and can be illustrated by the equation below:

$$\ln(y_t) = \beta_0 + \beta_1 \ln(x_{1t}) + \beta_2 \ln(x_{2t}) + \beta_3 \ln(x_{3t}) + \beta_4 \ln(x_{4t}) + e_t \quad (1)$$

$\ln$  refers to the natural logarithm; descriptions of the variables and sources of data are shown in Table 1, and  $e_t$  is the error term or white noise. Since the frequency of data is annual, the variance of ordinary least squares estimators would increase, leading to the issue of statistically incredible estimation results. To remedy this issue, quarterly data is derived using Denton's method.

The appropriateness of the model in Equation 1 is subject to the need to address the following issues. With the coefficient diagnostic, the variance inflation factors (VIF) aim to test for multicollinearity problems. The residual diagnostics refer to the Lagrange multiplier test (LM test), the White test, and the Jarque-Bera test (JB test), which aim to assess the autocorrelation, the heteroskedasticity, and the normality of error terms, respectively. At the same time, the stability diagnostic, the Ramsey regression equation specification error test (Ramsey RESET test), aims to identify specification error problems. Apart from this, the statistical significance must be determined for the test results of the explanatory variables. The parameters also need to be reviewed using the R-squared and adjusted R-squared.

To achieve the objective of this research concerning the analysis of the implications of tobacco control policies and measures in line with the WHO FCTC for the structural change to Thailand's tobacco leaf exports, the Chow breakpoint test is utilized. By the end of 2009, the WHO FCTC had been ratified by 168 countries, meaning that various policies in line with the WHO FCTC had been implemented (Sirichotiratana, 2015); therefore, this research identifies the periods before and after the structural change as 1998 to 2009 and 2010 to 2020, respectively. Consequently, the null ( $H_0$ ) and alternative hypotheses ( $H_1$ ) are expressed as follows:

$$H_0: \ln(y_t) = \beta_0 + \beta_1 \ln(x_{1t}) + \beta_2 \ln(x_{2t}) + \beta_3 \ln(x_{3t}) + \beta_4 \ln(x_{4t}) + e_t; \quad t = 1998, \dots, 2020,$$

$$H_1: \ln(y_t) = \alpha_0 + \alpha_1 \ln(x_{1t}) + \alpha_2 \ln(x_{2t}) + \alpha_3 \ln(x_{3t}) + \alpha_4 \ln(x_{4t}) + e_{1t}; \quad t_1 = 1998, \dots, 2009;$$

$$\ln(y_t) = \lambda_0 + \lambda_1 \ln(x_{1t}) + \lambda_2 \ln(x_{2t}) + \lambda_3 \ln(x_{3t}) + \lambda_4 \ln(x_{4t}) + e_{2t}; \quad t_2 = 2010, \dots, 2020$$

Where  $e_{1t}$  and  $e_{2t}$  are white noise, and it is assumed that  $e_{1t}$  is statistically independent of  $e_{2t}$ . To reject the null hypothesis,  $F_{cal} > F_{crit}$  where  $F_{cal}$  can be expressed as the following equation:

$$F_{cal} = \frac{(SSR_1 - (SSR_2 + SSR_3))/4}{(SSR_2 + SSR_3)/(48 + 44 - 8)} = \frac{(SSR_1 - (SSR_2 + SSR_3))/4}{(SSR_2 + SSR_3)/(84)} \quad (2)$$

Where  $SSR$  refers to the explained sum of squares, and  $SSR_1$ ,  $SSR_2$ ,  $SSR_3$  is derived from the estimates of the econometrics model under the null and alternative hypotheses above. Also, 4 indicates the number of parameters of the model under the null and alternative hypotheses above.  $F_{crit} = F_{0.05, 4, 84}$  is derived from the F-distribution tables. In addition, the number of observations before and after the structural break is 48 (quarterly data from 1998 to 2009) and 44 observations (quarterly data from 2010 to 2020), respectively.

**Table 1.** Definitions of variables and sources of information.

Variables	Explanation	Source of data
$y_t$	Value of tobacco leaf (Virginia, Burley, and Turkish) exports using the 2010 price from Thailand to the main trading partners including Germany, the UK, Belgium, Australia, the US, China, South Korea, Indonesia, the Philippines, Malaysia, and Lao PDR (Unit: Million USD)	Office of the Permanent Secretary of Ministry of Commerce (2022)
$x_{1t}$	Population of Thailand (Unit: Million)	World Bank Group (2022)
$x_{2t}$	Population of the main trading partners including Germany, the UK, Belgium, Australia, the US, China, South Korea, Indonesia, the Philippines, Malaysia, and Lao PDR (Unit: Million)	World Bank Group (2022)
$x_{3t}$	Value of GDP at 2010 price in Thailand (Unit: Million USD)	International Monetary Fund (IMF) (2022)
$x_{4t}$	Value of GDP with the 2010 price in the main trading partners including Germany, the UK, Belgium, Australia, the US, China, South Korea, Indonesia, the Philippines, Malaysia, and Lao PDR (Unit: Million)	International Monetary Fund (IMF) (2022) IndexMundi (2021)

**Note:** The value of export and GDP at the 2010 constant price is based on the US GDP Deflator at the 2010 price. The source of the GDP Deflator is International Monetary Fund (IMF) (2022).

#### 4. RESULTS AND DISCUSSION

To remedy the autocorrelation, the lag of the dependent variable and the second-order autoregressive model are added to the model described in Equation 1. The estimates from the econometrics model demonstrate the factors affecting Thailand's tobacco leaf exports from 1998 to 2020, as shown in Table 2a. After adjusting the residuals of the model with the first- and second-order autoregressive model, the estimates of the model are judged reliable from an econometrics point of view. This is because, firstly, the p-values in the LM test, White test, JB test, and RESET test are not able to reject a null hypothesis at a statistical significance of 0.05. Therefore, the model does not display significant concerns in the areas of autocorrelation, heteroscedasticity, or specification errors. Secondly, the adjusted R-squared is 0.995. Thirdly, only one explanatory variable does not display a statistical significance of 0.05 because the model falls within the multicollinearity problem according to the centered VIF, as shown in Table 2b. Therefore, the model is appropriate for our economic interpretation.

The estimated econometric model implies that if the real value of GDP in the main trading partner increases by 1%, Thailand's real export value of tobacco leaf (Virginia, Burley, and Turkish) will increase by 6.621% (Table 2a). This result supports the studies by Cantavella-Jordá and Guerra (2013) and Nkhoma, Mgale, and Yan (2021). The first study indicated that there is statistical evidence that income elasticity plays a significant role in the determination of export growth for Cuban tobacco. In the second study, the fixed effect model showed an overall positive and significant relationship between Malawi tobacco exports and importers' GDP.

The results of the Chow breakpoint test reveal that the structural change in Thailand's tobacco leaf exports before and after the first quarter of 2010 is statistically significant at 0.05, as shown in Table 2c. This provides empirical evidence to confirm the situation of tobacco leaf exports depicted in Figure 1, namely that the export values to Germany, the UK, Belgium, Australia, the US, and China had a negative trend from 1998 to 2020, while the export values to Indonesia, the Philippines, Malaysia, Lao PDR, and South Korea showed the opposite. Therefore, Thailand's total tobacco leaf exporting industry has significantly shifted from the old market (Germany, the UK, Belgium, Australia, the US, and China) to the new market (South Korea, Indonesia, the Philippines, Malaysia, and Lao PDR).

This is consistent with Frey (1997), who succinctly stated that the stream of the tobacco economy has flowed to less developed countries, namely Latin American and Asian countries.

Furthermore, it is implied that between 2010 and 2020 Thailand's tobacco leaf exports decreased significantly because the WHO FCTC was ratified by 168 countries and thus various policies in line with the WHO FCTC were implemented. This implication supports the findings of Ahsan et al. (2020), who stated that Indonesia's domestic tobacco production was reduced by approximately 20% due to tobacco control policies among its main trading partners. Apart from this, it further implied that not only economic factors, including exchange rate (Rezitis & Brown, 1999; Yanikkaya et al., 2013) and price (Bangara & Dunne, 2018; Rahmawati, 2013), but also tobacco control policies affect tobacco leaf exports. Examples of tobacco control laws and policies implemented by Thailand's old and new (ASEAN) export markets, including smoke-free places, tobacco advertising, promotion and sponsorship, tobacco packaging and labeling, cigarette contents and disclosures, and sales restrictions are summarized in Tables 3 and 4 for the respective export markets. The results suggest that the tobacco control policies and measures in ASEAN countries, including Indonesia, the Philippines, Malaysia, and Lao PDR, should be practically reassessed to achieve a more beneficial outcome.

Table 2. Estimation results.

a. The estimated econometrics model for Thailand's tobacco leaf exports.						
Constant and independent variables						
Dependent variable	$C$	$Ln(x_{1t})$	$Ln(x_{2t})$	$Ln(x_{3t})$	$Ln(x_{4t})$	$Ln(y_{t-1})$
$Ln(y_t)$	132.990 (24.506)**	26.270 (5.090)**	-48.557 (9.357) <sup>NS</sup>	-0.328 (0.255)**	6.621 (1.547)**	0.658 (0.085)**

AR(1) = 1.637, AR(2) = -0.834,

R-squared = 0.996, Adjusted R-squared = 0.995

Note: \*\* and NS refer to the statistical significance and non-significance at the 0.05 level, respectively.

b. The results of the econometrics problem diagnostics.					
Coefficient diagnostic		Residual diagnostic			Stability diagnostic
Variable	Centered VIF	LM test	White test	JB test	RESET test
$Ln(x_{1t})$	271.296	Obs×R-squared = 0.903 p-value of Chi-square = 0.342	Obs×R-squared = 40.050 p-value of Chi-square = 0.07	Jarque-Bera = 2.829 p-value = 0.2431	F-statistic = 1.667 p-value = 0.195
$Ln(x_{2t})$	1682.223				
$Ln(x_{3t})$	81.934				
$Ln(x_{4t})$	1086.007				

Note: Obs refers to the number of observations. As for the LM test, the null hypothesis is no serial correlation at up to 1 lag. In the RESET test, the omitted variables refer to the powers of fitted values from 2 to 3.

c. The results of the Chow breakpoint test.	
Chow Breakpoint Test: 2010Q1	
Null Hypothesis: No breaks at specified breakpoints	
F-statistic = 2.979	Prob. F(8,75) = 0.006

Note: F-statistic reflects  $F_{cal}$  in Equation 2 but the numerator is divided by 8 and the denominator is divided by 75. Therefore, the degree of freedom is also 8 and 75, respectively. It differs from the degree of freedom in Equation 2 because the lag of the dependent variable and the second-order autoregressive model plugs into the model to remedy the autocorrelation.

Table 3. Example of tobacco control laws in the selected countries (Old export market).

Tobacco control laws	Germany	The United Kingdom	Australia
Smoke-free places	Smoking is restricted in indoor workplaces and public places. Smoking areas may be permitted on means of transport where it is possible to have "physically separate units."	Smoking is prohibited on public transport and in indoor public places and indoor workplaces, including work vehicles. There are a few limited exceptions to the ban.	Smoking is prohibited in virtually all indoor workplaces, indoor public places, and on public transport, as well as in some outdoor places.
Tobacco advertising, promotion, and sponsorship	Tobacco advertising is prohibited on TV, radio, the internet, in most print publications, and in most outdoor places. Other types of print advertising are not covered under the law.	Tobacco advertising and promotion are generally prohibited, subject to a few exceptions such as direct person-to-person communications and retailer incentive programs.	Nearly all forms of tobacco advertising and promotion are prohibited by national and sub-national laws.
Tobacco packaging and labeling	For cigarettes, roll-your-own tobacco, and waterpipe tobacco, rotating combined picture and text health warnings must occupy 65 percent of the front and back of the package.	Standardized (Plain) packaging is required for all packages of cigarettes and hand-rolling tobacco as of May 20, 2017.	Different types of tobacco products must display different warnings. Plain packaging of tobacco products available for retail sale in Australia is required.

Tobacco control laws	Germany	The United Kingdom	Australia
Cigarette contents and disclosures	The law regulates specified contents in cigarettes, including banning characterizing flavors, ingredients that facilitate nicotine uptake, ingredients that may create an impression of health benefits, and ingredients associated with energy and vitality.	The law regulates specified contents of cigarettes, including banning characterizing flavors and ingredients that facilitate nicotine uptake, create the impression of health benefits, or are associated with energy and vitality, among others.	The contents and ingredients of cigarettes are not regulated at the national level. However, fruit and confectionery-flavored cigarettes are banned in all states and territories. In addition, mint is banned in at least one state.
Sales restrictions	The law prohibits the sale of a single cigarette, small packs of cigarettes, and tobacco for oral use. There are restrictions on the sale of tobacco products via vending machines, but no restrictions on the sale of tobacco products via the internet.	The law prohibits the sale of tobacco products via vending machines, a single cigarette, small packets of cigarettes, and tobacco for oral use.	All Australian states and territories prohibit the sale of a single cigarette and small packets of cigarettes.

Source: Tobacco Control Laws (2022).

Table 4. Example of tobacco control laws in the selected countries (ASEAN countries).

Tobacco control laws	Indonesia	The Philippines	Malaysia
Smoke-free places	Smoking is prohibited on public transport and in the following public places: healthcare facilities, educational facilities, and places of worship. In other types of public places and workplaces, designated smoking areas must be provided.	Smoking is prohibited in enumerated indoor public places and workplaces, while designated smoking areas are allowed in other public places and workplaces, including bars and nightclubs.	Smoking is prohibited on public transportation. Smoking is prohibited in specified public places and workplaces listed in the regulations.
Tobacco advertising, promotion, and sponsorship	Tobacco advertising and promotion are allowed with certain restrictions. Tobacco advertising on TV and radio may take place between the hours of 21:30 and 05:00 local time.	Many forms of tobacco advertising and promotion are prohibited, though tobacco advertising and promotion at points of sale and free distribution of tobacco products, among other promotional activities, are allowed.	Virtually all forms of tobacco advertising and promotion are prohibited. However, due to the lack of a definition of "tobacco promotion" in the law, some forms of tobacco promotion may not be covered by the ban.
Tobacco packaging and labeling	Pictorial health warnings are required to cover 40 percent of the main display areas parallel to the top edge of the packaging for most smoked and smokeless tobacco products.	Rotating and combined picture and text health warnings are required to be placed on 50 percent of each of the principal display areas of tobacco product packaging.	Rotating combined picture and text health warnings are required to occupy 50 percent of the front and 60 percent of the back of the package.
Cigarette contents and disclosures	Although regulation (PP) No. 109 in 2012 prohibits the use of additives in tobacco products "unless it has been scientifically proven that such additives are not harmful to health," no ministerial regulation has been issued to date, and additives are allowed in practice.	The law does not grant the authority to regulate the contents of cigarettes. The law does not require that manufacturers and importers disclose to government authorities information on the contents and emissions of their products.	The law does not grant the authority to regulate the contents of cigarettes. The law does not require that manufacturers and importers disclose to government authorities information on the contents and emissions of their products.
Sales restrictions	The law prohibits the sale of tobacco products via vending machines and in educational facilities, children's playgrounds, and healthcare facilities, as well as the sale of small packets of cigarettes.	The law prohibits the sale of small packets of cigarettes and the sale of tobacco products within 100 meters of schools, playgrounds, and other facilities frequented by minors.	The law prohibits the sale of tobacco products via vending machines, the internet, small packets of cigarettes, and a single cigarette. The sale of tobacco products to persons under the age of 18 is also prohibited.

Note: Indonesia is not a party to the WHO framework convention on tobacco control.

Source: Tobacco Control Laws (2022).

## 5. CONCLUSION

This research investigated the implications of the tobacco control policies and measures in line with the WHO FCTC for the structural change in Thailand's tobacco leaf exports. The implication is made clear by the result of the Chow breakpoint test, which showed that Thailand's total tobacco leaf export value has plummeted since 2010. Additionally, exports have shifted significantly from the old market to the new market, specifically to the ASEAN countries of Indonesia, the Philippines, Malaysia, and Lao PDR, since 2010. This shift reflects an area for improvement in these countries' tobacco control policies and measures. However, from an economic perspective, tobacco farmers in Thailand need to be supported by the government. The short-run policies, especially the compensation policy, should be maintained during the transition period of excise tax and the reduction of tobacco leaf's export values. At the same time, in the long run, policies such as crop substitution should be practically implemented.

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