

The Impact of Multi-Tiered Specific Excise Tax Systems on the Creation of New Tobacco Brands in Indonesia: Public Health Implications

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ABSTRACT: The manufacturing of new cigarette brands at low prices to exploit lower excise tax tiers poses a challenge to the intended objective of cigarette taxation, which is to reduce consumption for public health protection. This study aims to investigate the impact of a specific multi-tiered excise tax system on the creation of new brands. This study utilizes CK-1 data (application for ordering excise tape) from the Directorate General of Customs and Excise, Ministry of Finance (DJBC), as the authority overseeing cigarette excise taxes in Indonesia. The data consists of nine years of research observations, from 2012 to 2020, totaling 20,379 observations. The period used corresponds to the implementation of the multi-tiered specific cigarette excise tax system. Employing empirical analysis with Poisson regression, the study examines the count data of new brands. Dummy variables for cigarette production types and other relevant factors explaining the simplification policy of cigarette excise tax are included. The empirical analysis reveals a positive association between the implementation of a specific multi-tiered excise tax system and the creation of new cigarette brands. As the number of tiers in the excise tax system increases, so does the incentive for companies to introduce new brands. Furthermore, the analysis indicates that these new brands are typically priced lower, indicating a potential limitation of the specific multi-tiered excise tax system in reducing cigarette consumption. The findings suggest the consideration of a simpler and uniform cigarette excise tax system to address the challenges posed by the proliferation of low-priced new cigarette brands. Policy adjustments are crucial to ensure that excise taxes effectively align with public health objectives while maintaining government revenue. This study underscores the importance of refining taxation policies to mitigate negative health impacts on the public caused by increased cigarette consumption.

KEYWORDS: Tobacco Excise Tax, Multi-tier Tax System, New Cigarette Brands, Tax Avoidance, Tax Reform, Public Policy.

INTRODUCTION

Cigarette excise taxation has long been recognized as a potent tool for curbing cigarette consumption [1–4]. Specific excise tax systems offer advantages over ad valorem systems in this regard, as they more effectively drive up cigarette prices, thus reducing consumption [5–8]. While ad valorem taxes tie price increases directly to higher tax liabilities, specific excise taxes incentivize companies to raise prices to maintain optimal profits, irrespective of tax liabilities [8]. Consequently, specific excise tax systems tend to result in greater reductions in cigarette consumption compared to ad valorem systems.

However, the effectiveness of specific excise tax has not been fully compromised when implemented through a multi-tier system, thus such a system creates incentives for the production of cheap cigarettes, threatening efforts to reduce consumption [9–12]. Furthermore, various government efforts undertaken through Minister of Finance Regulation No. 146 of 2017 [13], where simplification of excise tax imposition gradually impacted the introduction of new cigarettes with attributes similar to existing ones conducted by companies to avoid higher taxes [14–17], resulting in higher price variations and increased consumption of cheap cigarettes [18–20].

In Indonesia, the introduction of a multi-tiered specific excise tax system in 2009, followed by simplification in 2012 and further tier increases to 12 tiers in 2015, has raised concerns [21]. Despite simplification efforts, the number of tax tiers remains relatively high, with significant tax differentials between tiers.

Consequently, cigarette prices have continued to rise, prompting companies to explore strategies to maintain or increase profits. This has led to the creation of new cigarette brands,

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particularly in response to the lower tax rates at the lowest tier [10; 12] (Figure 1).

However, empirical studies on the impact of multi-tiered systems on the creation of new cigarette brands are scarce [22–25], especially in the Indonesian context. While previous research by Hidayat & Surjono [21], Barber & Ah-san [12], and Bird [26] have examined consumer behavior in response to tax increases, little attention has been paid to cigarette companies’ strategies in creating new brands within multi-tiered tax systems. Theoretical studies have suggested a link between multi-tiered tax systems and the creation of new brands, but empirical evidence is lacking [22; 27]. Moreover, existing studies on this topic often overlook the influence of related party rules, which may affect companies’ decisions to create new brands [28–30]. Consequently, there is a need for empirical research to better understand how multi-tiered specific excise tax systems influence the creation of new cigarette brands and whether these brands are cheaper.

Therefore, this study aims to fill this gap by empirically examining cigarette companies’ behavior in creating new products within the multi-tiered specific excise tax system in Indonesia. Specifically, we investigate how the number of tax tiers influences the creation of new cigarette brands and whether these brands are cheaper.

The research question guiding this study is: How does the number of tax tiers in a multi-tiered specific excise tax system influence the creation of new cigarette brands, and are these brands typically cheaper?

The purpose of this study is to empirically investigate cigarette companies’ behavior in creating new products within the multi-tiered specific excise tax system in Indonesia.

Research hypotheses:

H1: The multi-tier excise tax system encourages the creation of new cigarette brands as a strategy to mitigate high excise taxes.

H2: The market’s competitive dynamics, influenced by the multi-tier tax system, result in fluctuating market entries, and exits of cigarette companies.

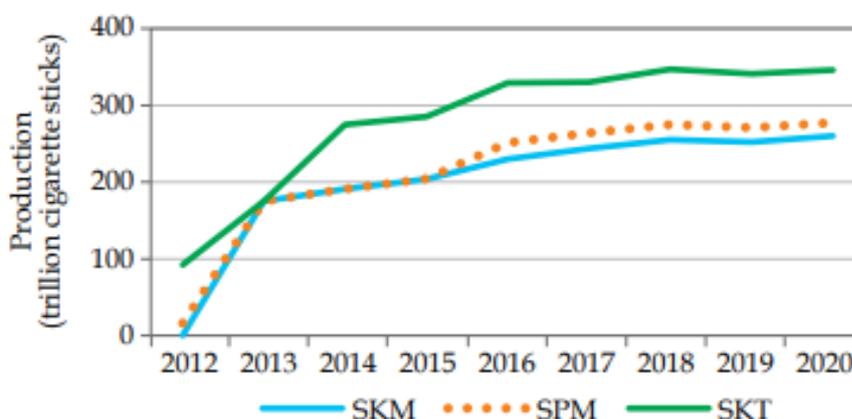
LITERATURE REVIEW

Conceptualization of the Problem

According to Barber et al. [12] and Laffer et al. [31], the cigarette market structure is typically centered around a few large companies, creating an oligopoly. Furthermore, Gravely et al. [25], Backer et al. [22], and Showalter [23] state that this market structure allows companies to set prices such that marginal revenue is below marginal cost, considering the addictive nature of cigarette consumption.

Laffer et al. [31] and Chaloupka [32] indicate that as long as future prices continue to rise above future marginal costs due to monopoly power, companies can sustain higher future profits by keeping current consumption high with lower prices.

Figure 1. Cigarette Production Growth in Indonesia, 2012–2020



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Note: Machine-Made Clove Cigarettes (SKM); Machine-Made White Cigarettes (SPM); Hand-Rolled Clove Cigarettes (SKT)

According to Becker et al. [22] and Chaloupka et al. [33], this phenomenon is known as “rational addiction”, which suggests that current consumption is influenced by past and future consumption patterns. Consequently, companies with significant market power aim to lower cigarette prices to entrap more smokers in addictive consumption and anticipating increased future demand [34].

Showalter [23] and Fethke & Jagannathan [35] explain that companies’ decisions to optimize future profits affect current addictive consumption, with strategies including pricing at or below marginal cost to maintain inter-temporal profit. Furthermore, Showalter [23] also mentions that higher excise taxes can shift consumer preferences toward lower-quality, lower-priced cigarettes. The response to tax-induced price increases is a crucial factor in the competitive dynamics of the cigarette market.

According to Jami et al. [27], a tiered tax system creates opportunities for companies to strategically position their products to exploit lower tax rates, where Chaloupka et al. [32] note that tax classifications are based on factors such as price, size, number of filters, production method, and quantity of cigarette production.

Ross et al. [10] and Bird [26] explain how companies create new brands to take advantage of lower rates within a tiered tax system, increasing the availability of cheaper brands and capturing consumer demand for affordable cigarettes.

Laffer et al. [31] mention that in an imperfect market, the marginal revenue curve lies below the average revenue curve. According Chaloupka et al. [32], taxes imposed at each production level, regardless of price, enable oligopoly companies to pass the tax burden onto consumers through higher prices, with Becker et al. [22] noting that this strategy effectively reduces cigarette consumption by increasing prices.

Jami et al. [27] and Showalter [23] state that a tiered tax system can lead to the perception of multiple markets based on tax layer classifications, creating varied price differentials. This encourages companies to introduce new brands to exploit lower tax brackets, maintaining profitability.

Hidayat & Surjono [21] found that the Indonesian government’s interrelation policies have addressed the strategy of establishing new companies to produce new brands under lower tariffs.

Excise Tax Structure and Cigarette Prices

Cigarette excise taxes play a crucial role in influencing cigarette prices, government revenue, and cigarette consumption Vellios et al. [36] demonstrated that increasing cigarette excise taxes is an effective measure to reduce cigarette demand.

Shang et al. [37] found that both specific and ad valorem excise tax structures impact cigarette price variability, with specific excise tax structures being associated with lower price variability.

Nargis et al. [38] indicate that a tiered excise tax structure can widen price differentials between cigarette brands, affecting consumer behavior towards lower-priced cigarettes.

Studies by Liber [9] and Kostova et al. [39] have also highlighted that a uniform high excise tax can reduce the range of cigarette prices, minimizing opportunities for smokers to switch to cheaper brands to avoid tax-driven price increases.

Linegar & van Walbeek [40] note that the pass-through of excise taxes to cigarette prices is influenced by market competitiveness, affecting the magnitude of price increases. Dare et al. [41] and Gligorić et al. [42] indicate that the price elasticity of demand for cigarettes shows that excise taxes can effectively reduce cigarette consumption.

Good child et al. [43] and Nor et al. [44] shows that the impact of excise taxes on cigarette prices is evident in various regions, such as Vietnam and Malaysia, where tax structures significantly

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influence pricing and market dynamics. Wang et al. [45] mention that excise taxes are a primary strategy for increasing cigarette prices in the United States and are crucial for public health efforts.

Shang et al. [30] state that the distribution of cigarette prices is influenced by the specific components of excise taxes, with countries having a higher specific component showing smaller price gaps between premium and low-priced brands.

In conclusion, excise tax structures have a substantial impact on cigarette prices, consumption, and market dynamics. Implementing effective excise tax policies can not only increase government revenues but also contribute to reducing cigarette consumption and promoting public health by making cigarettes less affordable and accessible.

Cigarette Prices and Consumption Patterns

Cigarette prices play a crucial role in influencing consumption patterns. Nargis et al. [46], Koffarnus et al. [47], and Barać et al. [48] indicates that the price elasticity of demand for cigarettes is a key factor in determining how price changes affect consumption levels. Barać et al. [48] also found that a 10% increase in cigarette prices can lead to a 4–8% reduction in consumption.

Koffarnus et al. [47] suggest that lower-income individuals tend to be more sensitive to price changes, exhibiting greater demand elasticity. This implies that price increases can have a more pronounced effect on reducing cigarette consumption among poor populations.

Nayab et al. [49] and Huang et al. [50] note that the impact of cigarette prices on consumption is not uniform, as different studies have highlighted variations in price elasticity across different regions and income groups. For instance, in China, a 10% increase in cigarette prices was associated with a 1.2% to 1.4% reduction in consumption among urban adult smokers. Similarly, in Pakistan, a 1% increase in cigarette prices led to a 1.06% decrease in consumption, indicating unitary elasticity. Lee et al. [51] shows that changes in cigarette prices can significantly affect smoking behavior, with price increases leading to reductions in consumption.

Studies by Nargis et al. [52], Hu et al. [53], and Tirtana & Ariautama [54] also emphasize the importance of considering factors such as income, affordability, and taxation policies in understanding tobacco consumption patterns. Overall, the evidence suggests that higher cigarette prices through taxation can be an effective strategy to curb cigarette consumption and promote public health.

Creation of New Brands

In developing new brands within the tobacco industry, it is crucial to consider various factors that influence brand creation and marketing strategies.

According to Scollo et al. [55], the tobacco industry has demonstrated adaptability to changing regulations and market conditions through innovations in product design, packaging, and branding. Strategies such as introducing new flavorings, filter advancements, and evocative product names are used to attract consumers and differentiate brands in the market. Additionally, umbrella branding, where new products are launched under existing brand families, is a common practice to leverage existing brand equity.

Creating new cigarette brands involves meticulous planning of marketing strategies and understanding consumer perceptions.

Wakefield et al. [56] mention that brand image significantly impacts cigarette marketing, with packaging serving as a vital element in brand communication and enhancing in-store visibility. Tobacco companies strategically use cigarette packaging to convey brand image and establish a strong presence at the point of sale, especially given restrictions on traditional tobacco marketing channels.

Payne [57] argue that it is essential to understand consumer behavior and preferences to design brand relationships and experiences that resonate with target audiences. Hammond et al. [58] note that the rise of e-cigarettes has introduced new dynamics to the tobacco market, with brands like JUUL quickly gaining attention.

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Hsu et al. [59] observe that the growth of the e-cigarette industry has seen major tobacco companies entering the market and a surge in vape shops, indicating a shift in consumer preferences toward electronic nicotine delivery systems.

Tang et al. [60] point out that monitoring emerging e-cigarette brands and flavors on platforms like Twitter offers insights into market trends and consumer preferences, facilitating brand development and marketing strategies.

According to Gilmore et al. [61], when developing new cigarette brands, pricing strategies and market segmentation must be carefully considered to effectively reach diverse consumer groups.

Bansal et al. [62] and Nguyen et al. [63] further mention that tobacco companies have implemented sophisticated advertising campaigns targeting various de-mographics, including men, women, and youth from different socioeconomic backgrounds. Understanding the impact of tobacco taxation on brand-switching behavior is crucial, as pricing can influence consumer choices and brand loyalty.

In conclusion, establishing new cigarette brands necessitates a comprehensive understanding of market trends, consumer behavior, regulatory frameworks, and competitive landscape. By leveraging innovative product designs, strategic branding initiatives, and effective marketing strategies, tobacco companies can successfully position their brands in a dynamic and highly regulated industry.

DATA AND METHODS

Data Source

This study utilizes CK-1 data (application for ordering excise tape) from the Directorate General of Customs and Excise, Ministry of Finance (DJBC), as the authority overseeing cigarette excise taxes in Indonesia. The data consists of nine years of research observations, from 2012 to 2020, totaling 20,379 observations. The period used corresponds to the implementation of the multi-tiered specific cigarette excise tax system. The data utilized represents the entire population of tobacco (cigarette) companies registered and reporting their production to the DJBC, thus providing a comprehensive portrayal of the Indonesian context.

Empirical Specification

This study's empirical model adopts the empirical strategy employed by Hi-dayat & Surjono [21]. Furthermore, Hi-dayat & Surjono [21] examined the effect of tariff simplification on cigarette consumption in Indonesia. Given the different research objectives, modifications were made to the empirical strategy used. Therefore, we propose an empirical model to investigate company behavior in producing new brands under the multi-tiered specific excise tax system as follows:

$$\begin{aligned} Sum_NewBrand_{j,t} = & \alpha_0 + \alpha_1 Sum_Tier_{j,t} + \\ & + \alpha_2 Gap_Lowest_Price_{ij,t-1} + \\ & + \alpha_3 IncreaseExcise_Rate_{j,t} + \\ & + \alpha_4 D_{SKM} + \alpha_5 D_{SPM} + \epsilon_{i,t} \end{aligned}$$

where Sum_NewBrand – total number of new cigarette brands; Sum_Tier – total number of excise tax tiers; Gap_Lowest_Price – difference in average cigarette prices within a company compared to the lowest-priced cigarette in the same cigarette production type; IncreaseExcise_Rate – rate of increase in excise tax for specific cigarette production types; DSKM – dummy variable for SKM cigarette production type, with a value of 1 for SKM-type cigarette brands and 0 for other types; DSPM – dummy variable for SPM cigarette production type, with a value of 1 for SPM-type cigarette brands and 0 for other types. SKT cigarette brands are the reference; i – index of cigarette companies; j – index of cigarette production types (SKM, SPM, SKT); t – time index within the yearly period.

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This research utilizes population data encompassing all registered cigarette companies in Indonesia across SKM, SPM, and SKT production types to assess the impact of the specific multi-tier excise tax system from 2012 to 2020 on the number of new cigarette brands (Sum_NewBrand).

Sum_NewBrand, as the dependent variable, represents the quantity of new cigarette brands produced by company *i* in production type *j* in year *t*, where these brands were not produced by the company in the previous year. The measurement does not consider the possibility of brands existing in previous periods but temporarily not being produced in subsequent periods before reappearing in later periods.

The main variable of interest in this study is the number of excise tax tiers in each production type (Sum_Tier), which elucidates the multi-tier system as a factor influencing companies' decisions to create new cigarette brands.

Sum_Tier is utilized to examine the impact of the specific multi-tier excise tax system on the strategy of creating new cigarette brands by companies. A higher number of tax tiers incentivizes companies to leverage lower tax rates by introducing new cigarette brands in response to high excise taxes [12; 25]. The number of tax tiers in each cigarette production type changes almost every year due to government policy simplifications.

Hence, the hypothesis used in this analysis posits that a higher number of cigarette excise tax tiers (indicative of a more multi-tier system) correlates with a greater number of new cigarette brands produced by companies in a specific cigarette production type, indicating that companies benefit from optimal excise tax rates to enhance their profitability.

To address another aspect of the problem formulation regarding the creation of new cigarette brands resulting in cheaper cigarettes, empirical testing is required through the difference in average cigarette prices within a company compared to the lowest price in a specific cigarette type in the previous period (Lowest_Price).

This variable is utilized because regulations stipulate that current cigarette prices must be higher than those in the previous period. Thus, when cigarette prices in a specific production type increase compared to competitors', companies are incentivized to create new cigarette brands at lower prices. This aligns with the WHO's research [25], which suggests that a larger price gap between cheaper and more expensive cigarettes due to tax increases smokers' incentives to switch to cheaper cigarettes based on their income.

Consequently, the hypothesis for this variable is that if the price difference increases and the number of new cigarette brands created also increases, the company employs a strategy of creating new cigarette brands to produce cheaper cigarettes and take advantage of lower excise taxes.

The creation of new cigarette brands is also influenced by the prevailing cigarette excise tax rates. The empirical strategy employed involves examining the excise tax simplification policy being implemented by the Indonesian government. As a result of this policy, the percentage increase in cigarette tariffs undergoing simplification is higher than that of other cigarette tariffs. This leads to an increase in the prices of cheap cigarettes, resulting in reduced price variability and diminishing incentives for smokers to switch to cheaper cigarettes [21]. Therefore, a variable describing the percentage increase in cigarette excise tax rates due to this simplification policy in the relevant year for a specific production type is utilized (IncreaseExcise_Rate).

The utilization of the IncreaseExcise_Rate variable demonstrates companies' behavior in determining the strategy for creating new cigarette brands while considering the prevailing excise tax rates and optimal profitability. To maximize profits, companies address the increase in cigarette excise tax rates by creating new cigarette brands and applying low excise taxes. The lower the increase in excise tax rates in a multi-tier system, the higher the incentive for companies to produce cheaper cigarettes and increase the availability of cheap brands [12].

Hence, the hypothesis for this variable is that if the increase in excise tax rates for a specific production type decreases, companies will have an incentive to create new cigarette brands.

Another variable is the dummy variable for cigarette production types. Dummy variables are used because they are inherent to the cigarette brand [21]. The presences of these dummy variables indicates that if other variables remain constant or have the same value (number of tax tiers, cigarette prices, and excise taxes), the creation of new brands will occur in specific production types. This demonstrates companies' preferences for cigarette production types in creating new brands. It is assumed that companies strategize the creation of new cigarette brands based on the consideration that consumers are in- different to the excise tax rates of the cigarettes they consume, focusing instead on the type and flavor of the cigarette (cigarette production type).

The production type variable utilizes dummies for SKM (DSKM) and SPM (DSPM), with SKT as the base in this study. For the DSKM dummy, it will be assigned a value of 1 if the produced cigarettes belong to the SKM production type and 0 for cigarettes of other production types. Similarly, the DSPM dummy will be assigned a value of 1 if the produced cigarettes are of the SPM production type and 0 for other production types.

The hypothesis for these dummy variables has a negative parameter, indicating that the creation of new cigarette brands mostly occurs in the SKT production type. This is because consumers of SKT cigarettes are the largest segment compared to other production types, suggesting that the creation of new brands is primarily carried out in production types with a high market share.

Estimation Method

The estimation method employed in this study is Poisson regression because the dependent variable is the sum of new brands, making the data count data. This type of data causes it not to follow a normal distribution. The Poisson process involves calculating the number of discrete events over a continuous time interval.

The Poisson distribution provides a realistic model for random events, with the number of these random events being counted as a Poisson distribution. If the number of events is large, it will approximate a normal distribution, but if it is small, it will not be normally distributed [64].

Therefore, the Poisson distribution can model cases with rare event occurrences. In the use of Poisson regression models, the parameter values must first be estimated using the maximum likelihood method. Once the parameter estimates are known, significance tests for the model are conducted.

RESULTS

Statistical Description

In the sample data used, there are 20,369 cigarette brands circulating in Indonesia during the period from 2012 to 2020, produced by 5,995 registered companies, each having a Taxable Goods Entrepreneur Identification Number (NPPBKC). Out of the total number of brands in circulation during that period, there are 5,172 new brands created. On average, 575 new brands emerge each year.

This indicates a relatively high number of new cigarette brands introduced annually. The highest number of new brands produced by a single cigarette company is 34 brands per year. The majority of new brands are generated in the tax tier for SKT production, characterized by the lowest tariffs and prices, as well as the highest number of tiers.

This supports the suspicion of new brand creation for cheap cigarettes. However, further empirical analysis is needed to provide insight into whether the creation of new brands is indeed a strategy employed by companies to avoid higher excise taxes while maintaining profit margins. In Figure 2, it can be observed that the number of cigarette companies fluctuates annually. Therefore, in the Indonesian cigarette industry, each year sees the entry of many new companies into the market, but also the exit of a considerable number of companies from the market.

However, the cigarette market share in Indonesia is still dominated by three major companies, controlling 71% of the market share, making the cigarette market in Indonesia an

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oligopoly [12]. The fluctuation in the number of companies is also due to the inability of small companies to cope with competition in the oligopoly market, leading to many companies exiting the market.

Meanwhile, the significant number of new companies could be attributed to the existence of companies creating affiliate companies to leverage the multi-tier excise tax structure. Additionally, the presence of new companies may be driven by the significant profits available in the oligopolistic cigarette market, prompting them to enter the cigarette industry in both the short and long term. This is also due to the continued high number of consumers in the cigarette industry, inviting new companies to profit from the industry.

Meanwhile, the number of companies creating new brands has relatively decreased each year. This can be attributed to the simplification policy implemented by the Indonesian government. In Figure 3, it can be seen that not all companies create new cigarette brands. Generally, most companies continue to produce existing brands.

This may be because companies have calculated that creating new brands may not necessarily increase their profits. By continuing to produce existing cigarette brands, companies have already achieved their goal of increasing profits. Moreover, this behavior may be influenced by the increasing cigarette excise taxes and government policies restricting companies from strategizing to create new cigarette brands.

The number of cigarette brands circulating in Indonesia is quite high, as shown in Figure 4, but the number of cigarette brands fluctuates annually, showing a fluctuating trend. This is because companies strategize their cigarette brand production. This strategy involves producing new cigarette brands in previous periods, but these brands are not produced in subsequent periods.

Figure 2. Number of Companies per Year per Cigarette Production Type

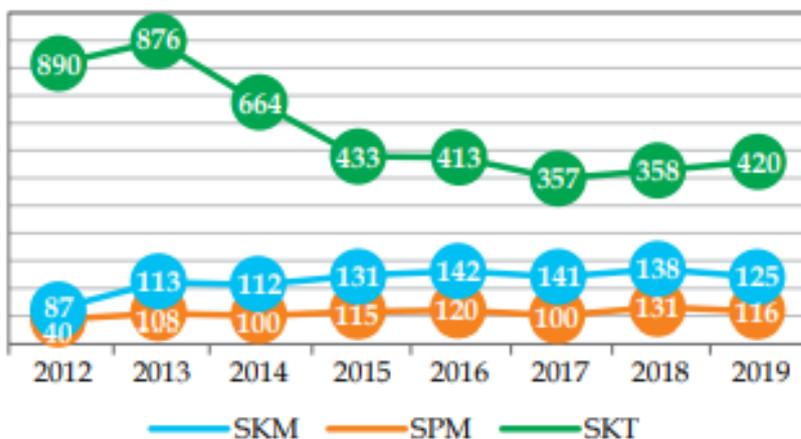
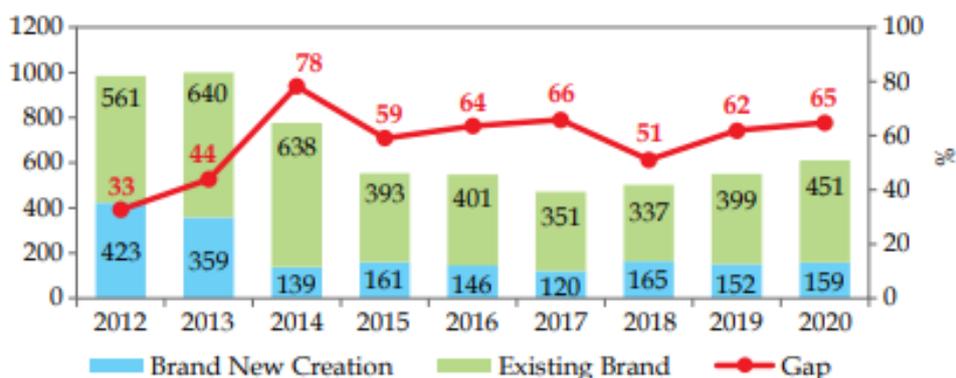


Figure 3. Number of Companies Creating New Brands and Companies Continuing to Produce Existing Brands



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Additionally, companies may reintroduce or discontinue cigarette brands in subsequent periods. This is possible because there are no regulations prohibiting it; instead, there is an obligation for the price of the same cigarette brand to increase in subsequent periods. The number of new cigarette brands produced each year relatively increases in each production type, as shown in Figure 5.

Although the Indonesian government has implemented excise tax simplification policies, the number of new brands produced remains relatively high. The creation of new brands can be done to increase company profits without being influenced by tax avoidance.

Additionally, companies create cheap cigarettes to capture low-income consumer markets. Therefore, empirical testing is needed to examine the behavior of cigarette companies in creating new brands.

Since the specific system was implemented, the Indonesian government has continuously simplified the tiers gradually. The simplification policy by the Indonesian government has resulted in a reduction in the number of excise tariff tiers, as shown in Figure 6.

This is expected to impact the increase in excise tariffs and raise cigarette prices in the lower tiers [21]. Simplification is carried out on the number of tariff tiers for the main cigarette production types, namely SKM, SPM, and SKT. The number of tariff tiers continues to decrease, and starting from 2015, it changed to 12 tiers. The number of tariff tiers for SKM and SPM production types remains the same each year, indicating that the simplification policy for both types of cigarette production is treated equally. The SKM and SPM cigarette production types experienced a reduction in the number of tariff tiers from six to three from 2014 to 2018.

Figure 4. Number of Cigarette Brands

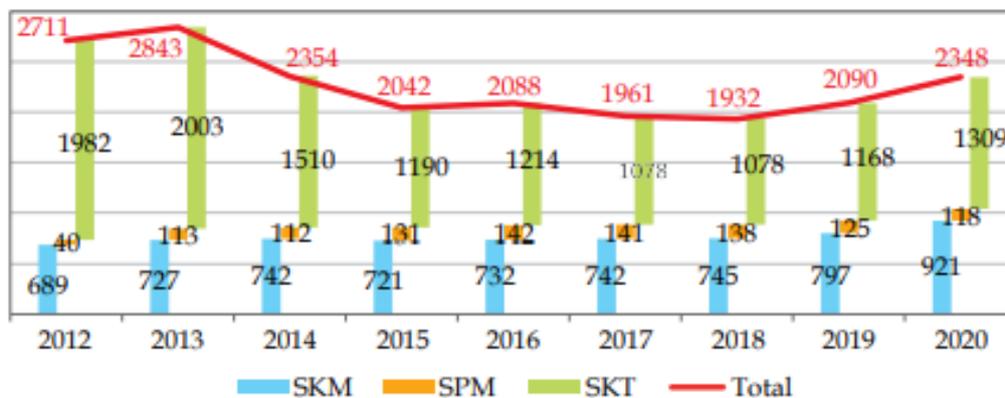
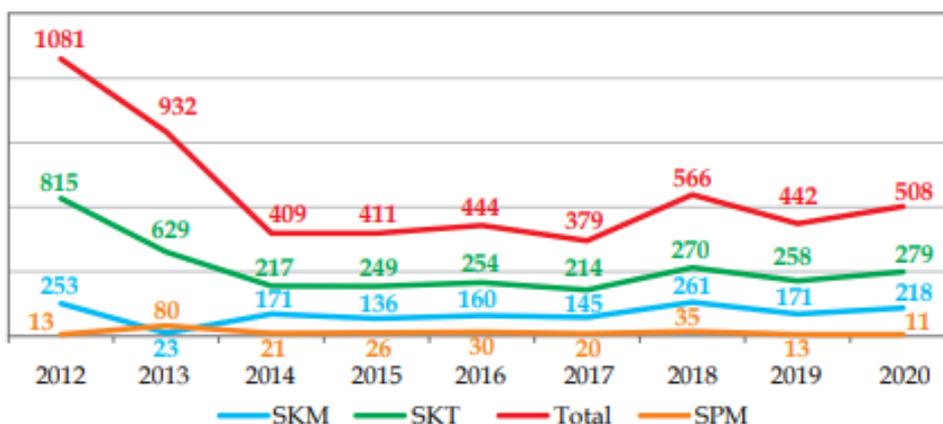


Figure 5. Number of New Cigarette Brands per Year per Cigarette Production Type



On the other hand, the SKT cigarette production type's tariff tiers did not experience a significant decrease in the number of tiers. The reduction in the number of SKT tariff tiers only

occurred in 2015, from seven tiers to six tiers. However, until 2020, the number of tariff tiers for SKT cigarettes remained the same. This indicates that the excise tax structure for SKT cigarettes has not yet undergone significant simplification. Thus, there is a high possibility of tax avoidance in the multi-tier excise tax structure for SKT cigarettes.

In Figure 7, it is evident that the price of new cigarette brands is relatively cheaper than existing cigarette brands. This data indicates that companies have the option to produce new brands at lower prices. If companies continue to produce existing cigarettes, the cigarette prices will continue to increase due to the rise in excise taxes. By producing new cigarette brands, companies can sell them at lower prices, benefit from lower excise tariffs, and even capture markets with low-income consumers. Therefore, further analysis of this company behavior is necessary.

As a result of the simplification policy, the percentage increase in the excise tariff for cigarettes undergoing simplification is higher than the percentage increase in other cigarette tariffs. This causes cheap cigarettes to experience price increases, making price options less varied and reducing incentives for smokers to switch to cheaper cigarettes [21] (Figure 8).

Figure 9 shows the percentage increase in cigarette excise tariffs due to the simplification policy in the respective years and cigarette production types. To maximize profits, companies will counter the increase in cigarette excise tariffs by creating new cheap cigarette brands to be taxed at lower tiers. The lower the increase in excise tariffs in a multi-tier system, the higher the incentive for companies to produce cheaper cigarettes and increase the availability of cheap brands [12].

Figure 6. Number of Cigarette Excise Tariff Tiers per Cigarette Production Type

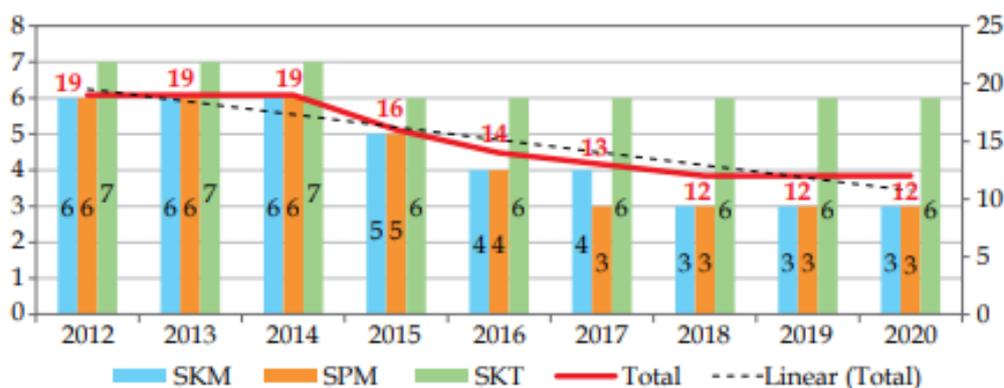


Figure 7. Comparison of Prices of New and Existing Cigarette Brands



Based on Figure 9, the highest percentage increase in excise tariffs occurred in 2015 for SKM cigarette production. This could be due to the simplification policy implemented that year, where the merging of tariffs from several simplified tiers led to an increase in tariffs to higher tiers. Meanwhile, in 2017, there were no changes in tariffs or simplification policies. This could be due to the global economic crisis, which provided an opportunity for producers to address the losses caused by the situation.

The Law Number 11 of 1995 concerning Excise, as last amended by Law Number 6 of 2023, has set the maximum excise tax limit on cigarettes produced in Indonesia [65; 66]. This limit is set at

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57% of the base price if the retail selling price is used. The retail selling price or the sticker price reported by cigarette companies must not be lower than the reference price set by the government annually through excise tax rate determination. In Figure 8, it is shown that the excise tariff-to-cigarette price ratio does not reach the 57% limit except in 2015 when the tariff simplification policy was implemented, so the limit did not apply at that time.

SKM cigarette production type has the highest average ratio compared to other cigarette production types. This is because the government sets high excise tariffs and retail selling price limits for this type of production.

Thus, companies have limited room to set prices to achieve optimal profits. Conversely, the SKT cigarette production type has the lowest ratio because the cigarette excise tariffs and retail selling prices for this production type are the lowest. Therefore, companies have more flexibility in setting prices to achieve optimal profits.

Thus, there is a need for optimal policies on excise tariffs and retail selling prices to ensure that the cigarettes produced have prices that are not affordable to reduce cigarette consumption.

Figure 8. Ratio of Excise Tariff to Price per Cigarette Production Type

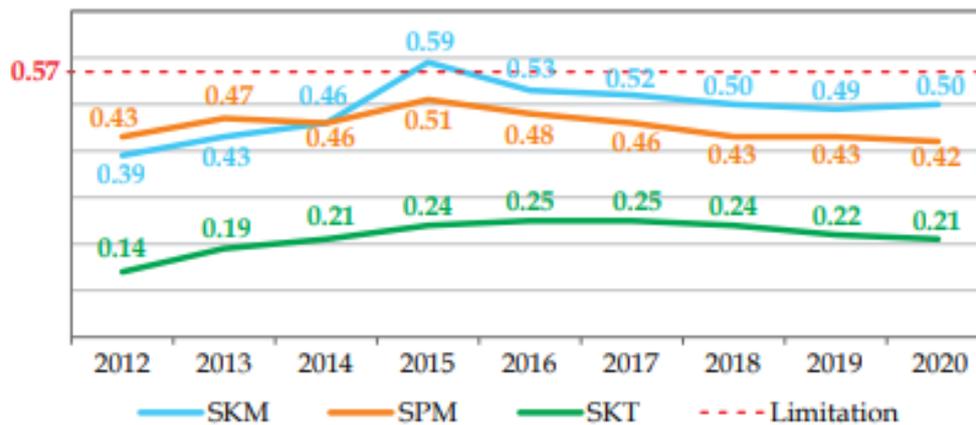
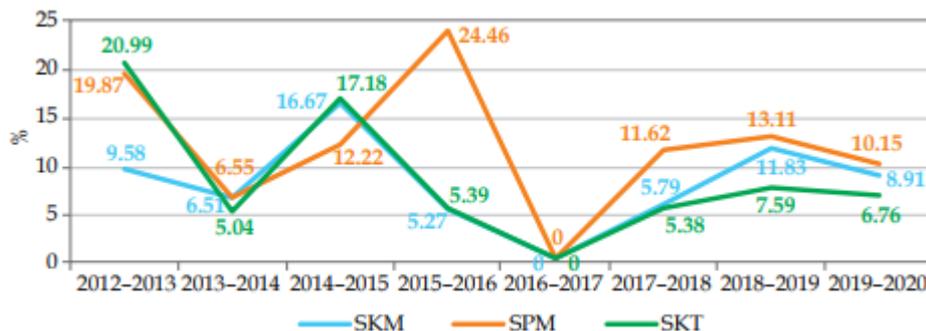


Figure 9. Rate of Increase in Excise Tariff per Cigarette Production Type, %



Estimation Results

To examine the estimation results of the influence of the multi-tier specific excise tax system on the creation of new cigarette brands, refer to Table 1.

The main variable in this study is the number of cigarette excise tariff tiers in cigarette production types, where the estimation results show a significant positive correlation with the number of new cigarette brands produced by companies in the same cigarette production types.

The more excise tariff tiers there are in the cigarette tax structure (multi-tiers), the greater the incentive for companies to create new cigarette brands. Thus, confirming previous research that theoretically explains how an increasing number of tariff tiers incentivize companies to utilize lower tariffs by creating new cigarette brands in response to high excise taxes [10; 26].

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The second variable of interest to address the research question is the average price difference of cigarettes produced by a company compared to the lowest price in the previous year's cigarette production type (Gap_Lowest_Price).

The estimation results indicate that there is an incentive for companies to create new brands influenced by existing cigarette prices in cigarette production types, resulting in newly created cigarettes being priced lower. Thus, the results confirm the hypothesis that company strategies involve creating new brands to avoid higher excise taxes and obtain lower prices and tariffs. The greater the price gap between cheaper and more expensive cigarettes due to tax increases, the greater the incentive for smokers to switch to cheaper cigarettes according to their income [25].

From these empirical results, we can observe company behavior in facing their competitors who produce cheaper cigarettes. If a company's cigarette prices are higher than its competitors', the company will produce new, cheaper cigarette brands. By creating new, cheaper cigarette brands compared to existing ones, companies can compete with competitors who already have inexpensive cigarette brands.

Meanwhile, the estimation results indicate that the creation of new cigarette brands is not necessarily influenced by the prevailing cigarette excise tax. This is shown by the non-significant IncreaseExcise_Rate variable. A low rate of increase in cigarette excise tax in the same production type in the previous year does not necessarily influence companies to create new cigarette brands.

Table 1. Estimation Results

Independent Variable	Number of New Cigarette Brands (Sum_NewBrand)
Number of tariff tiers in each cigarette production type (Sum_Tier)	0.129*** (0.0386)
Lowest price in cigarette production types (Gap_Lowest_Price)	0.001*** (0.0003)
Rate of increase in cigarette excise tax (IncreaseExcise_Rate)	-0.347 (0.4180)
Dummy for Cigarette Production Type SKM (DSKM)	1.156*** (0.1050)
Dummy for Cigarette Production Type SPM (DSPM)	0.712*** (0.1910)
Constant	-1.928*** (0.2640)
Number of Observations	17,965
Number of Observation Groups per Company	5,985

Notes: Standard error values in parentheses, + p < .10; * p < .05; ** p < .01; *** p < .001

This means that companies can consider the prevailing excise tax in their new cigarette brand production strategy. When considering creating new brands in a specific cigarette production type, companies need to determine the excise tariff tiers to be applied to their cigarette brands to ensure that the profit generated from this strategy remains optimal. To maximize margins, companies will counteract the increase in cigarette excise taxes by creating new, low-tariff cigarette brands.

However, such considerations may not necessarily be the primary concern. Thus, this analysis does not confirm previous research, where the lower the increase in excise tariffs in a multi-tier system, the higher the incentive for companies to produce cheaper cigarettes and increase the availability of cheap brands [12].

Nevertheless, these analysis results still support the excise tax simplification policy being implemented by the Indonesian government. This is because if this policy is implemented in the long term, it may influence company behavior. As a result of this simplification policy, the percentage increase in excise tariffs for cigarettes undergoing simplification is higher than the percentage increase in other cigarette tariffs, causing cheap cigarettes to experience price increases, making price options less varied, and reducing incentives for smokers to switch to cheaper cigarettes [21].

Therefore, the government must remain consistent in implementing this simplification policy with the provision that the percentage increase in excise tariffs must remain high to disincentivize companies from engaging in tax avoidance through creating new brands.

Cigarette production types have a significant influence on the creation of new brands. From the obtained parameter results, both types of production show positive and significant values. This is evident in the DSKM and DSPM dummy variables, indicating that the creation of new brands predominantly occurs in SPM production types. This contradicts the hypothesis that suggests the creation of new brands mostly occurs in SKT, which has a larger market share compared to other cigarette production types.

Meanwhile, the SKM production type also sees more creation of new brands compared to SKT. Thus, companies tend to create new brands in the SKM production type if other factors remain the same because the market dominance in this production type is not yet high enough.

DISCUSSION

The analysis of the results provides valuable insights into the behavior of cigarette companies in Indonesia regarding the creation of new cigarette brands within the multi-tier specific excise tax system. Firstly, the significant number of new cigarette brands introduced annually, averaging 575 new brands per year, indicates a prevalent strategy among companies to continuously innovate and adapt to the tax structure to maintain or increase profits.

This finding aligns with previous theoretical research suggesting that an increasing number of tax tiers incentivize companies to create new brands as a response to high excise taxes [12; 21]. Moreover, the concentration of new brands in the lowest tax tier supports the suspicion that companies exploit lower tariffs to produce cheaper cigarettes [14; 15].

The fluctuation in the number of cigarette companies entering and exiting the market highlights the competitive dynamics within the Indonesian cigarette industry. While the market remains dominated by a few major companies, the entry of new players indicates the allure of potential profits despite the oligopolistic nature of the market.

The fluctuation could also be attributed to the inability of smaller companies to compete effectively within the oligopoly [67], leading to their exit. Additionally, the presence of new companies, possibly leveraging the multi-tier tax structure, suggests a strategic response to market opportunities and regulatory conditions.

The first hypothesis H1 posited that the multi-tier excise tax system encourages the creation of new cigarette brands as a strategy to mitigate high excise taxes. The data confirm this hypothesis, as evidenced by the introduction of an average of 575 new brands annually. This trend is corroborated by similar findings in other markets with multi-tiered tax systems, such as the studies by Ross et al. [10] and WHO [25], which highlight how tax avoidance strategies lead to increased brand proliferation in response to tiered tax structures.

The second hypothesis H2 suggested that the market's competitive dynamics, influenced by the multi-tier tax system, result in fluctuating market entries, and exits of cigarette companies. This hypothesis is supported by the observed market behavior, where the number of companies varies annually, indicating both the appeal and challenges of competing in an oligopolistic market. Research by Nargis et al. [18] supports this finding, showing that complex tax systems can create barriers for smaller companies while providing opportunities for strategic market positioning by new entrants.

In light of these conclusions, it is recommended that policymakers consider transitioning to a single-tier cigarette tax system, also known as a uniform tax. Research conducted in Egypt has demonstrated the effectiveness of such a transition in reducing cigarette consumption. For example, a study by Shang et al. [30] found that a uniform tax system reduced price variability, which in turn reduced the incentive for consumers to switch to cheaper brands, ultimately decreasing overall cigarette consumption.

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Given the ongoing increase in cigarette production in Indonesia under the specific multi-tiered tax system, further exploration of the uniform tax system is warranted. Additionally, adjustments to specific tariff increase policies should be made in line with inflation to ensure their effectiveness over time. Research by Filby et al. [68] supports this approach, indicating that inflation-adjusted excise taxes maintain their impact on consumption levels more effectively than static tax rates.

In summary, this study sheds light on the need for continued policy refinement to address the complexities of cigarette taxation and consumption. By adopting a uniform tax system and implementing consistent simplification policies and excise tax increases, policymakers can work towards reducing cigarette consumption and achieving state revenue objectives while ensuring the scientific novelty of the research. The confirmation of the study's hypotheses through comparison with similar works underscores the validity of these recommendations and highlights the potential for significant public health benefits.

CONCLUSION

This study delved into the impact of Indonesia's multi-tiered specific cigarette tax system on the creation of new cigarette brands, providing a company-level analysis within the cigarette production sector. The results underscored how the complexity of the excise tax structure incentivizes companies to introduce new cigarette brands, particularly those positioned in lower tax tiers. This behavior indicates a strategic response by companies to avoid higher tax rates, thereby maintaining their profitability and market share in the cheaper cigarette segment.

The primary purpose of this study was to examine how the multi-tiered specific excise tax system in Indonesia influences the creation of new cigarette brands. This objective was fulfilled through a detailed analysis of company behaviors, revealing a significant trend of brand proliferation driven by tax structure complexities. By analyzing data on the number of new cigarette brands introduced annually and their distribution across tax tiers, the study effectively demonstrated the strategic responses of cigarette companies to the multi-tier tax system.

The key findings of the study are as follows.

First, an average of 575 new cigarette brands are introduced annually, primarily concentrated in the lowest tax tier. This indicates a strategic move by companies to exploit lower tariffs.

Second, the fluctuation in the number of cigarette companies entering and exiting the market highlights the competitive nature of the Indonesian cigarette industry. Despite the dominance of a few major players, new companies are attracted by potential profits, although many smaller companies struggle to compete.

Third, the current multi-tier tax system appears to undermine efforts to reduce cigarette consumption by allowing the proliferation of cheaper brands. This finding suggests the need for a policy shift towards a uniform tax system to effectively discourage smoking.

The findings of this study hold significant theoretical and practical implications. Theoretically, this study adds to the existing body of literature on tobacco taxation by providing empirical evidence from the Indonesian context. It supports theories suggesting that complex tax structures lead to brand proliferation as a tax avoidance strategy.

Moreover, the study provides a deeper understanding of how cigarette companies adapt their strategies in response to tax policies, contributing to economic theories on market behavior and oligopoly dynamics.

Practically, the study offers actionable insights for policymakers. The recommendation to transition to a single-tier, uniform tax system is backed by empirical evidence and comparisons with other countries, such as Egypt, where such policies have proven effective in reducing cigarette consumption. By highlighting the shortcomings of the multi-tiered tax system, the study provides a basis for designing more effective tobacco control policies. Adjusting excise taxes in line with

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inflation and simplifying the tax structure could enhance policy efficacy in reducing smoking rates.

In summary, this study sheds light on the need for continued policy refinement to address the complexities of cigarette taxation and consumption. The multi-tiered excise tax system in Indonesia encourages the creation of new, cheaper cigarette brands, which undermines efforts to reduce smoking prevalence. By adopting a uniform tax system and implementing consistent simplification policies and excise tax increases, policymakers can work towards reducing cigarette consumption and achieving state revenue objectives.

The findings emphasize the importance of strategic tax policy design in achieving public health goals, contributing to both theoretical understanding and practical policy-making in the realm of tobacco control.

REFERENCES

- Adrison V., Dauchy E. (2023). The impact of tax and price reforms on companies' prices in a complex cigarette tax system. *Applied Economics*. 1–20. <https://doi.org/10.1080/00036846.2023.2289905>
- Anderson S.P., de Palma A., Kreider B. (2001). Tax incidence in differentiated product oligopoly. *Journal of Public Economics*. 81(2):173–192. [https://doi.org/10.1016/S0047-2727\(00\)00079-7](https://doi.org/10.1016/S0047-2727(00)00079-7)
- Bansal R., John S., Ling P.M. (2005). Cigarette advertising in Mumbai, India: targeting different socioeconomic groups, women, and youth: Table 1. *Tobacco Control*. 14(3):201–206. <https://doi.org/10.1136/tc.2004.010173>
- Barać Ž.A., Burnać P., Rogošić A., Šodan S., Vuko T. (2021). Cigarette price elasticity in Croatia – analysis of household budget surveys. *Journal of Applied Economics*. 24(1):318–328. <https://doi.org/10.1080/15140326.2021.1928421>
- Barber S., Ahsan A. (2009). The tobacco excise system in Indonesia: Hindering effective tobacco control for health. *Journal of Public Health Policy*. 30(2):208–225. <https://doi.org/10.1057/jphp.2009.12>
- Barnetta P.G., Keeler T.E., Hu T. W. (1995). Oligopoly structure and the incidence of cigarette excise taxes. *Journal of Public Economics*. 57(3):457–470. [https://doi.org/10.1016/0047-2727\(95\)80006-U](https://doi.org/10.1016/0047-2727(95)80006-U)
- Becker B.G.S, Grossman M., Murphy K.M. (1994). An Empirical Analysis of Cigarette Addiction. *The American Economic Review*. 84(3):396–418. <https://doi.org/10.7312/gros17812-025>
- Bhuyan S., Lopez R.A. (1997). Oligopoly Power in the Food and Tobacco Industries. *American Journal of Agricultural Economics*. 79(3):1035–1043. <https://doi.org/10.2307/1244442>
- Bird K. (1999). Concentration in Indonesia Manufacturing, 1975–93. *Bulletin of Indonesian Economic Studies*. 35(1):43–73. <https://doi.org/10.1080/00074919912331337487>
- Callison K., Kaestner R. (2014). Do higher tobacco taxes reduce adult smoking? New evidence of the effect of recent cigarette tax increases on adult smoking. *Economic Inquiry*. 52(1):155–172. <https://doi.org/10.1111/ecin.12027>
- Chaloupka F.J., Kostova D., Shang C. (2014). Cigarette Excise Tax Structure and Cigarette Prices: Evidence from the Global Adult Tobacco Survey and the U.S. National Adult Tobacco Survey. *Nicotine & Tobacco Research*. 16(1):S3–S9. <https://doi.org/10.1093/ntr/ntt121>
- Chaloupka F.J., Peck R., Tauras J.A., Xu X., Yurekli A. (2010). Cigarette Excise Taxation: The Impact of Tax Structure on Prices, Revenues, and Cigarette Smoking. Working Paper No. 16287. <https://doi.org/10.3386/w16287>
- Chaloupka F.J., Powell L.M., Warner K.E. (2019). The Use of Excise Taxes to Reduce Tobacco, Alcohol,

- Steviana Pasca Sarjana, Vid Adrison** - The Impact of Multi-Tiered Specific Excise Tax Systems on the Creation of New Tobacco Brands in Indonesia: Public Health Implications and Sugary Beverage Consumption. *Annual Review of Public Health*. 40(1):187–201. <https://doi.org/10.1146/annurev-publhealth-040218-043816>
- Chaloupka F.J., Straif K., Leon M.E. (2011). Effectiveness of tax and price policies in tobacco control. *Tobacco Control*. 20(3):235–238. <https://doi.org/10.1136/tc.2010.039982>
- Chaloupka F.J., Sweanor D., Warner K.E. (2015). Differential Taxes for Differential Risks – Toward Reduced Harm from Nicotine-Yielding Products. *New England Journal of Medicine*. 373(7):594–597. <https://doi.org/10.1056/NEJMp1505710>
- Chaloupka F.J., Yurekli A., Fong G.T. (2012). Tobacco taxes as a tobacco control strategy. *Tobacco Control*. 12:172–180. <https://doi.org/10.1136/tobaccocontrol-2011-050417>
- Chen C.M., Chang K.L., Lin L., Lee J.L. (2014). Brand switching or reduced consumption? A study of how cigarette taxes affect tobacco consumption. *The European Journal of Health Economics*. 15(9):991–998. <https://doi.org/10.1007/s10198-013-0549-1>
- Cummings K., Hyland A., Peckacek T., Orlandi M., Lynn W. (1997). Comparisons of recent trends in adolescent and adult cigarette smoking behaviour and brand preferences. *Tobacco Control*. 6(2):S31–S37. https://doi.org/10.1136/tc.6.suppl_2.S31
- Dare C., Boachie M.K., Tingum E.N., Abdullah S.M., van Walbeek C. (2021). Estimating the price elasticity of demand for cigarettes in South Africa using the Deaton approach. *BMJ Open*. 11(12):e046279. <https://doi.org/10.1136/bmjopen-2020-046279>
- Delipalla S., Keen M. (1992). The comparison between ad valorem and specific taxation under imperfect competition. *Journal of Public Economics*. 49(3):351–367. [https://doi.org/10.1016/0047-2727\(92\)90073-O](https://doi.org/10.1016/0047-2727(92)90073-O)
- Delipalla S., O'Donnell O. (2001). Estimating tax incidence, market power and market conduct: The European cigarette industry. *International Journal of Industrial Organization*. 19(6):885–908. [https://doi.org/10.1016/S0167-7187\(99\)00057-0](https://doi.org/10.1016/S0167-7187(99)00057-0)
- Erasashanti A.P., Cahaya Y.F., Yuniarti R., Rifaldi M., Prasetyo J.H. (2024). The Role of Taxpayer Awareness in Enhancing Vehicle Tax Compliance in Indonesia: An Attribution Theory Approach. *Journal of Tax Reform*. 10(1):162–180. <https://doi.org/10.15826/jtr.2024.10.1.163>
- Fauzi R., Pongpanich S. (2022). The effect of price on cigarette consumption among youth in Indonesia: Implications for tobacco tax policy. *World Medical & Health Policy*. 14(4):665–678. <https://doi.org/10.1002/wmh3.516>
- Fethke G., Jagannathan R. (1996). Habit persistence, heterogeneous tastes, and imperfect competition. *Journal of Economic Dynamics and Control*. 20(6-7):1193–1207. [https://doi.org/10.1016/0165-1889\(95\)00895-0](https://doi.org/10.1016/0165-1889(95)00895-0)
- Filby S., Pienaar D., Stoklosa M., Drope J., Reid J.L. (2022). The impact of excise tax structure on cigarette prices and affordability: A comparative analysis. *Tobacco Control*. 31(2):123–130. <https://doi.org/10.1136/tobaccocontrol-2021-056789>
- Gilmore A.B., Tavakoly B., Taylor G., Reed H. (2013). Understanding tobacco industry pricing strategy and whether it undermines tobacco tax policy: the example of the UK cigarette market. *Addiction*. 108(7):1317–1326. <https://doi.org/10.1111/add.12159>
- Gligorić D., Preradović Kulovac D., Mičić L., Pepić A. (2022). Price and income elasticity of cigarette demand in Bosnia and Herzegovina by different socioeconomic groups. *Tobacco Control*. 31(2):s101–s109. <https://doi.org/10.1136/tobaccocontrol-2021-056881>
- Goodchild M., Thu L.T., The Son D., Nguyen Tuan L., Totanes R., Paul J., Park K. (2021). Modelling the

Steviana Pasca Sarjana, Vid Adrison - The Impact of Multi-Tiered Specific Excise Tax Systems on the Creation of New Tobacco Brands in Indonesia: Public Health Implications

- expected impact of cigarette tax and price increases under Vietnam's excise tax law 2015–2020. *Tobacco Control*. 30(6):675–679. <https://doi.org/10.1136/tobaccocontrol-2020-055920>
- Gravelly S., Giovino G.A., Craig L., Commar A., D'Espaignet E.T., Schotte K., Fong G.T. (2017). Implementation of key demand-reduction measures of the WHO Framework Convention on Tobacco Control and change in smoking prevalence in 126 countries: an association study. *The Lancet Public Health*. 2(4):e166–e174. [https://doi.org/10.1016/S2468-2667\(17\)30045-2](https://doi.org/10.1016/S2468-2667(17)30045-2)
- Hammond D., Wackowski O.A., Reid J.L., O'Connor R.J. (2020). Use of JUUL E-cigarettes Among Youth in the United States. *Nicotine & Tobacco Research*. 22(5):827–832. <https://doi.org/10.1093/ntr/nty237>
- Hanson A., Sullivan R. (2009). The Incidence of Tobacco Taxation: Evidence from Geographic Micro-level Data. *National Tax Journal*. 62(4):677–698. <https://doi.org/10.17310/ntj.2009.4.05>
- He Y., Ma S., Yang Q., Shang C. (2023). How cigarette excise tax pass-through to prices responds to the uptake and evolution of e-cigarettes (ECs). *Tobacco Control*. <https://doi.org/10.1136/tc-2023-058078>
- Hidayat A., Surjono N.D. (2016). Impact of specific excise rate simplification on cigarette consumption and government revenue in Indonesia. *World Customs Journal*. 10(1):73–100. <https://doi.org/10.55596/001c.115309>
- Hsu G., Sun J.Y., Zhu S.H. (2018). Evolution of Electronic Cigarette Brands From 2013–2014 to 2016–2017: Analysis of Brand Websites. *Journal of Medical Internet Research*. 20(3):e80. <https://doi.org/10.2196/jmir.8550>
- Hu X., Wang Y., Huang J., Zheng R. (2019). Cigarette Affordability and Cigarette Consumption among Adult and Elderly Chinese Smokers: Evidence from A Longitudinal Study. *International Journal of Environmental Research and Public Health*. 16(23):4832. <https://doi.org/10.3390/ijerph16234832>
- Huang J., Zheng R., Chaloupka F.J., Fong G.T., Jiang Y. (2015). Differential responsiveness to cigarette price by education and income among adult urban Chinese smokers: findings from the ITC China Survey. *Tobacco Control*. 24(3):iii76–iii82. <https://doi.org/10.1136/tobaccocontrol-2014-052091>
- Jami M., Kostova D., Mbulo L., Benjakul S., Kengganpanich M., Andes L. (2017). Changes in cigarette prices, affordability, and brand-tier consumption after a tobacco tax increase in Thailand: Evidence from the Global Adult Tobacco Surveys, 2009 and 2011. *Preventive Medicine*. 105(SI):S4–S9. <https://doi.org/10.1016/j.yjmed.2017.05.027>
- Koffarnus M.N., Wilson A.G., Bickel W.K. (2015). Effects of Experimental Income on Demand for Potentially Real Cigarettes. *Nicotine & Tobacco Research*. 17(3):292–298. <https://doi.org/10.1093/ntr/ntu139>
- Kostova D., Chaloupka F.J., Yurekli A., Ross H., Cherukupalli R., Andes L., Asma S. (2014). A cross-country study of cigarette prices and affordability: evidence from the Global Adult Tobacco Survey. *Tobacco Control*. 23(1):e3. <https://doi.org/10.1136/tobaccocontrol-2011-050413>
- Laffer A.B. (2016). *Handbook of Tobacco Taxation: Theory and Practice (Economic Theory of Taxation)*. *Economic Policy*. 11(5):50–67. (In Russ.)
- Lee J.M., Hwang T.C., Ye C.Y., Chen S.H. (2004). The effect of cigarette price increase on the cigarette consumption in Taiwan: evidence from the National Health Interview Surveys on cigarette consumption. *BMC Public Health*. 4(1):61. <https://doi.org/10.1186/1471-2458-4-61>
- Lee J.M., Liao D.S., Ye C.Y., Liao W.Z. (2005). Effect of cigarette tax increase on cigarette

Steviana Pasca Sarjana, Vid Adrison - The Impact of Multi-Tiered Specific Excise Tax Systems on the Creation of New Tobacco Brands in Indonesia: Public Health Implications

- consumption in Taiwan. *Tobacco Control*. 14(1):i71–i75. <https://doi.org/10.1136/tc.2004.008177>
- Liber A.C., Ross H., Ratanachena S., Dorotheo E.U., Foong K. (2015). Cigarette price level and variation in five Southeast Asian countries. *Tobacco Control*. 24(e2):137–142. <https://doi.org/10.1136/tobaccocontrol-2013-051184>
- Linegar D.J., van Walbeek C. (2018). The effect of excise tax increases on cigarette prices in South Africa. *Tobacco Control*. 27(1):65–71. <https://doi.org/10.1136/tobaccocontrol-2016-053340>
- Nargis N., Fong G.T., Chaloupka F.J., Li Q. (2014). The choice of discount brand cigarettes: a comparative analysis of International Tobacco Control surveys in Canada and the USA (2002–2005). *Tobacco Control*. 23(1):i86–i96. <https://doi.org/10.1136/tobaccocontrol-2012-050851>
- Nargis N., Hussain A.G., Goodchild M., Quah A.C., Fong G.T. (2019). A decade of cigarette taxation in Bangladesh: lessons learnt for tobacco control. *Bulletin of the World Health Organization*. 97(3):221–229. <https://doi.org/10.2471/BLT.18.216135>
- Nargis N., Stoklosa M., Shang C., Drope J. (2021). Price, Income, and Affordability as the Determinants of Tobacco Consumption: A Practitioner’s Guide to Tobacco Taxation. *Nicotine & Tobacco Research*. 23(1):40–47. <https://doi.org/10.1093/ntr/ntaa134>
- Nargis N., Zheng R., Xu S.S., Fong G.T., Feng G., Jiang Y., Wang Y., Hu X. (2019). Cigarette Affordability in China, 2006–2015: Findings from International Tobacco Control China Surveys. *International Journal of Environmental Research and Public Health*. 16(7):1205. <https://doi.org/10.3390/ijerph16071205>
- Nayab D., Nasir M., Memon J.A., Khalid M., Hussain A. (2020). Estimating the price elasticity for cigarette and chewed tobacco in Pakistan: evidence from micro-level data. *Tobacco Control*. 29(5):s319–s325. <https://doi.org/10.1136/tobaccocontrol-2019-055232>
- Nguyen A., Nguyen The H., Nguyen N.A. (2022). Brand-switching and tobacco taxation in Viet- nam. *Tobacco Control*. 31(2):s88–s94. <https://doi.org/10.1136/tobaccocontrol-2021-056821>
- Nor N.M., Bui W.K.T., Ghani J.A., Hassan N., Baharom N. (2022). Impact of Tobacco Control Policies on Cigarette Consumption in Malaysia. *International Journal of Business and Society*. 23(3):1739–1752. <https://doi.org/10.33736/ijbs.5199.2022>
- Payne A., Storbacka K., Frow P., Knox S. (2009). Co-creating brands: Diagnosing and designing the relationship experience. *Journal of Business Research*. 62(3):379–389. <https://doi.org/10.1016/j.jbusres.2008.05.013>
- Prasetyo B.W., Adrison V. (2019). Cigarette prices in a complex cigarette tax system: empirical evidence from Indonesia. *Tobacco Control*. 29(6):618–623. <https://doi.org/10.1136/tobaccocontrol-2018-054872>
- Ross H., Tesche J., Vellios N. (2017). Undermining government tax policies: Common legal strategies employed by the tobacco industry in response to tobacco tax increases. *Preventive Medicine*. 105(1):S19–S22. <https://doi.org/10.1016/j.ypmed.2017.06.012>
- Santoso D.B., Erlando A. (2020). Tobacco excise tax policy in Indonesia: who does reap the benefits? *Entrepreneurship and Sustainability Issues*. 8(1):1108–1121. [https://doi.org/10.9770/jesi.2020.8.1\(74\)](https://doi.org/10.9770/jesi.2020.8.1(74))
- Scollo M., Bayly M., White S., Lindorff K., Wakefield M. (2018). Tobacco product developments in the Australian market in the 4 years following plain packaging. *Tobacco Control*. 27(5):580–584. <https://doi.org/10.1136/tobaccocontrol-2017-053912>
- Shang C., Chaloupka F.J., Fong G.T., Thompson M., O’Connor R.J. (2015). The association between tax

- Steviana Pasca Sarjana, Vid Adrison** - The Impact of Multi-Tiered Specific Excise Tax Systems on the Creation of New Tobacco Brands in Indonesia: Public Health Implications
structure and cigarette price variability: findings from the ITC Project. *Tobacco Control*. 24(3):iii88–iii93. <https://doi.org/10.1136/tobaccocontrol-2014-051771>
- Shang C., Chaloupka F.J., Zahra N., Fong G.T. (2014). The distribution of cigarette prices under different tax structures: findings from the International Tobacco Control Policy Evaluation (ITC) Project. *Tobacco Control*. 23(1):i23–i29. <https://doi.org/10.1136/tobaccocontrol-2013-050966>
- Showalter M.H. (1999). Firm behavior in a market with addiction: The case of cigarettes. *Journal of Health Economics*. 18(4):409–427. [https://doi.org/10.1016/S0167-6296\(99\)00006-5](https://doi.org/10.1016/S0167-6296(99)00006-5)
- Snyder H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*. 104:333–339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Stern N. (1987). The effects of taxation, price control and government contracts in oligopoly and monopolistic competition. *Journal of Public Economics*. 32(2):133–158. [https://doi.org/10.1016/0047-2727\(87\)90009-0](https://doi.org/10.1016/0047-2727(87)90009-0)
- Tang Q., Zhou R., Xie Z., Li D. (2022). Monitoring and Identifying Emerging e-Cigarette Brands and Flavors on Twitter: Observational Study. *JMIR Formative Research*. 6(12):e42241. <https://doi.org/10.2196/42241>
- Tellis G.J. (1986). Beyond the Many Faces of Price: An Integration of Pricing Strategies. *Journal of Marketing*. 50(4):146–160. <https://doi.org/10.2307/1251292>
- Tirtana A., Ariutama I.G.A. (2022). The effect of cigarette prices and income on cigarettes consumption and state revenue: Case study of 33 provinces in Indonesia. *Jurnal Ekonomi dan Bisnis*. 25(1):137–152. <https://doi.org/10.24914/jeb.v25i1.4037>
- Vellios N., van Walbeek C., Ross H. (2020). Illicit cigarette trade in South Africa: 2002–2017. *Tobacco Control*. 29(4):s234–s242. <https://doi.org/10.1136/tobaccocontrol-2018-054798>
- Wakefield M., Morley C., Horan J.K., Cummings K.M. (2002). The cigarette pack as image: new evidence from tobacco industry documents. *Tobacco Control*. 11(1):i73–i80. https://doi.org/10.1136/tc.11.suppl_1.i73
- Wang X., Xu X., Tynan M.A., Gerzoff R.B., Caraballo R.S., Promoff G.R. (2017). Tax Avoidance and Evasion: Cigarette Purchases from Indian Reservations Among US Adult Smokers, 2010–2011. *Public Health Reports*. 132(3):304–308. <https://doi.org/10.1177/0033354917703653>
- White J.S., Ross H. (2015). Smokers' strategic responses to Sin Taxes: Evidence from panel data in Thailand. *Health Economics*. 24(2):127–141. <https://doi.org/10.1002/hec.3004>