ANALYSIS OF *FORESTALLING* BEHAVIOR OF THE CIGARETTE INDUSTRY IN INDONESIA

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ABSTRACT

This study aims to analyze the behavior of companies in forestalling under various conditions of multitier specific excise tariff structure in Indonesia. This was done by the company as a form of anticipation of changes in excise rates and Retail Selling Prices set by the government. The timing of announcements, simplification of tiers and production limits also provide incentives and disincentives for companies to carry out forestalling. To see the effect of changes in the tariff structure, CK-1 data (excise tape ordering) obtained from the Directorate General of Customs and Excise (DJBC), Ministry of Finance, from 2009 to 2017 was used. Empirical results show that excise tariff policies encourage companies to do forestalling. While the retail selling price policy, longer announcement times and the difference between total production and production limits hold companies back from forestalling. Simplification policies and increasing production limits can reduce high levels of forestalling.

Keywords: *tariff, excise, retail sale price, forestalling*

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1. INTRODUCTION

The forestalling strategy, also known as stockpiling, is a tactical approach employed by the tobacco industry to proactively address potential future increases in excise taxes. This involves the bulk purchase of tax stamps still governed by the old Retail Selling Price (RSP) and outdated tax rates before the introduction of new RSP and tax structures. By implementing this strategy, companies can defer acquiring new tax stamps until the existing ones are entirely sold and absorbed by the market. On the positive side, the forestalling behavior significantly bolster government revenue. The pre-implementation period witnesses a sharp surge in revenue, contributing substantially to the overall financial health of the state. Conversely, this preemptive maneuver negatively impacts cigarette consumption, as it fails to decrease despite the tax rate hike. This phenomenon arises from companies having ample time and opportunity to gradually implement price increases, employing a strategy known as increasing smoothing price.

The company purchases tax stamps in large quantities before the tariff increase with the aim of avoiding a sudden price hike at the onset of the new excise tax rates. The company recognizes that an abrupt price increase may lead to a sudden decline in cigarette consumption, and future consumption heavily relies on current consumption (Becker, Grossman, and Murphy 1991; Showalter 1999). By selling cigarettes with the old tax stamps, the company is still able to maintain consumption stability while gradually raising price until it reaches the new tax stamps price

Several efforts were made by other governments in preventing forestalling related to changes in excise rate increases in old and new bands. In the Philippines, the government continues to monitor this forestalling behavior, and the policy carried out is to simplify the excise system into a single tier. In Poland, the government banned the sale of cigarettes that still used the old excise tape. In Denmark and the United Kingdom, the government restricted the sale of excise bands before the introduction of new excise tariffs. In Latvia and Slovenia, companies selling cigarettes are responsible for paying the difference between the old excise rate and the new excise rate (Ross, Tesche, and Vellios 2017).

For the case in Indonesia that adheres to a multitier-specific excise tax system, forestalling behavior consistently occurs every year. The degree of forestalling behavior varies between years because the timing of announcements also varies each year. Generally, the government issues regulations on changes in excise rates between two and three months before the effective date (January 1) of the new excise tax takes effect. The earlier the announcement and effective implementation, the more challenging it is for companies to engage in forestalling due to time constraints. In Contrast, the later means the company may opt to engage in forestalling, as they can implement alternative strategies to anticipate future excise tax hike. The extent of forestalling behavior is highly dependent on the timing of the announcement and the percentage increase in excise tax.

Despite the government's annual increases in tobacco excise taxes, cigarette consumption has not declined; in fact, it has shown an upward trend (Figure 1.1). From 2009 to 2015, excise tape orders consistently rose, but in 2016 and 2017, there was a noticeable decline. One key factor contributing to the inefficacy of the tax hikes is the specific multitier and multirate tax system in Indonesia. The primary weakness of this tax system lies in its tendency to incentivize both producers and consumers to anticipate and strategically respond to any government-

imposed tariff increases. Manufacturers, for instance, may shift to lower tiers if a substantial tariff hike is perceived as a disincentive to future profitability (Barber and Ahsan, 2009). Likewise, consumers are affected by the variations in tiers and tariffs, creating a pricing diversity akin to an ad valorem system. This diversity allows consumers to switch to alternative types or brands sold at lower prices when faced with significant price increases in other brands. Recognizing this consumer behavior, manufacturers strive to ensure the availability of affordable cigarette options to maintain and potentially boost consumption levels.

Figure 1.1 Monthly Graph of Customs Tape Orders in Indonesia
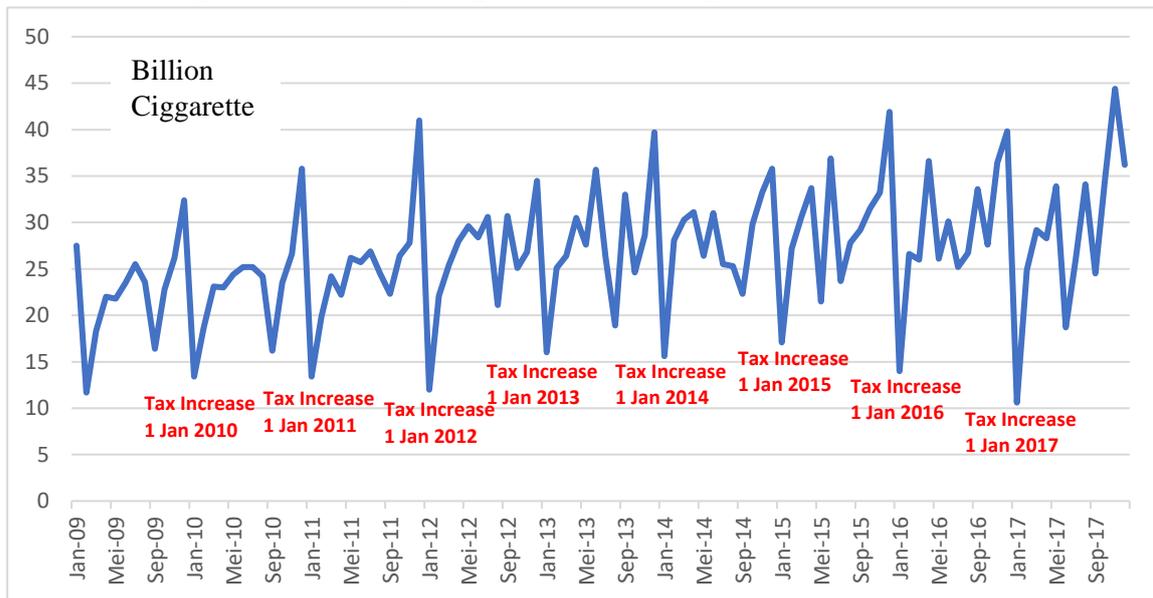
Source : DJBC, processed by the author

The trend of forestalling behavior of the cigarette industry in Indonesia tends to occur every year, especially when the government announces tariff increases two to three months in advance, so cigarette manufacturers can take advantage of this strategy to anticipate a decrease in consumption. Research related to the strategy of cigarette manufacturers in responding to the increase in excise rates is generally through the strategy of determining retail selling prices to consumers). Meanwhile, forestalling behavior is attracting attention to be raised as research because it is related to the phenomenon of increasing the amount of production after the announcement month.

Research on forestalling is still limited to descriptive analysis (Ross et al., 2017). Research related to excise tends to be related to the effect of tax increases on consumption (Anderson, De Palma, &; Kreider, 2001; Gao, Zheng, & Hu, 2012; Keeler, Hu, Barnett, & Manning, 1993; Lee et al., 2005; Linegar &; Van Walbeek, 2018; Sullivan & Dutkowsky, 2012; Tauras, 2018; Wakefield &; Chaloupka, 2000; Wasserman, Manning, Newhouse, & Winkler, 1991). By using analysis at the brand level, the behavior of production forestalling in various conditions of multitier-specific structures in various government policies taken can be seen the difference.

2. LITERATURE REVIEW AND HYPHOTESIS DEVELOPMENT
2.1 Theoretical framework

Rational addictive behavior emphasizes that for addictive goods, consumers can still make rational decisions. There are two conditions that can be categorized as addictive behavior, namely reinforcement and tolerance. Reinforcement means that the more you consume an item, the greater the desire to maintain that consumption. Tolerance is the more a good consumes, the smaller its utility to that good in the future (Becker et al. 1991; Gruber and Koszegi 2004). It is assumed that consumption of cigarettes as addictive goods is influenced by price, income and consumption in the past (Becker et al. 1991; Showalter 1999).

$$Q_{it} = Q(P_{it}, Y_{it}, Q_{i(t-1)}) \tag{1}$$

Furthermore, the value Q_{it} is determined by the producer, then the maximization of the present value of the company's profit (Sofia Delipalla and Keen 1992; Showalter 1999) are:

$$\pi_{it} = \sum_{t=1}^{\infty} \beta^{t-1}(P_{it} - c_{it})Q(P_{it}, Y_{it}, Q_{i(t-1)}) \tag{2}$$

Where the value $\beta = \frac{1}{1+r}$ and $P_{it} = ((1 - t_{vt})P_{bt} - t_{st})$

P_{bt}	=	Price at T before being taxed
P_{it}	=	Price on T after being taxed
c_{it}	=	Total cost on t
Q_{it}	=	amount of consumption at this time
$Q_{i(t-1)}$	=	the amount of consumption in the previous period
t_{vt}	=	*Advalorem* rates on t
t_{st}	=	Specific rates on t
Y_{it}	=	revenue on t
π_{it}	=	profit on t
β	=	*discount rate*

First Order Condition against P_{it} is
$$\beta^{t-1}\left[Q_{it} + (P_{it} - c_{it})\frac{\partial Q_{it}}{\partial P_{it}} + D_{it}\right] \tag{3}$$
where
$$D_{it} = \sum_{j=t+1}^{\infty} \beta^{i-t}(P_{ij} - c_{ij})\frac{\partial Q_{ij}}{\partial P_{it}} \tag{4}$$
D_{it} shows *marginal profit in the future due to current price changes*

Modifications to equations (3)
$$\frac{(P_{it} - c_{it})}{P_{it}} = \left(-\frac{1}{\varepsilon_{it}}\right)\left(1 + \frac{D_{it}}{Q_{it}}\right) = \left(-\varepsilon_t\left(\frac{Q_{it}}{Q_{it}+D_{it}}\right)\right)^{-1} = -(\varepsilon_{it}R_{it})^{-1} \tag{5}$$
where
$$\varepsilon_{it} \equiv \frac{\partial Q_{it}}{\partial P_{it}}\frac{P_t}{Q_t} < 0 \quad \text{and} \quad R_{it} \equiv \frac{Q_{it}}{Q_{it}+D_{it}}$$

If producers value future profits so important, then the value is even greaterR_{it}
Q_{it} on is the current marginal profitR_{it}
D_{it} on is marginal profit in the futureR_{it}

With great value on R_{it} (value of $D_{it} < 0$), and inelastic demand, producers will sell goods in large quantities at low prices, with the aim of obtaining large quantities of current consumption. The amount of current consumption is used as the basis of consumption for the future at $t + 1$. In figure 2.1, it is shown that at the time t, the supply curve shifts to the right to a decrease in price, leading to an increase in the quantity sold from previous Q_1^* to Q_2^*. Subsequently, the value of Q_2^* at time t used as the of market equilibrium basis in period $t + 1$. This is done because in period $t + 1$, the government raises the excise rates, causing the supply curve to shift to the left. The increase in the tax rate encourages an increase in price and decrease in consumption from Q_1^* to Q_2^* in period $t + 1$.

Figure 2.1 Demand and Supply curves between time
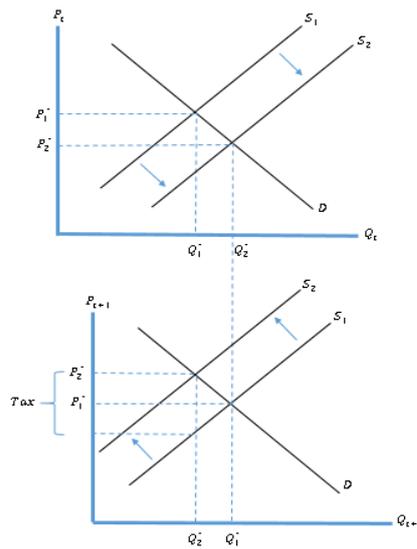
Showalter (1999) through the concept of "*intertemporal profit by* forward looking producers" states that decisions regarding future cigarette consumption depend not only on "*forward looking consumers*" (Becker et al. 1991) but also on "*forward looking producers"*. The decision taken by the producer is the decision of price and quantity of production. The decision on the amount of production today depends largely on the amount of consumption that existed in the past, or current consumption becomes the basis for future consumption. With low prices today, producers can obtain a very high consumption base, and if tariffs increase in the future, producers can estimate the amount of consumption decline that may occur. To maintain intertemporal profit, producers keep the increase in every one percent cigarette price smaller than the decrease in the percentage of cigarette consumption.

Furthermore, Ross, Tesche & Vellios (2017) emphasized that in anticipation of the government's decision to increase excise rates in the future, producers take forestalling actions. Conceptually, it can be understood that forestalling decisions made by the cigarette industry are strongly influenced by the decision on how much to increase excise taxes made by the government. In addition, to be able to forestalling or buy excise tapes in large quantities is also greatly influenced by the company's financial capabilities. The company's financial capability in the case of Indonesia can be seen from the classification of companies. Group I companies

(annex 1) with larger production capacities have greater ability to also be able to purchase large quantities of excise tape or do forestalling.

2.2 Conceptualization of the problem

The theory of "*Rational Addiction*" (Becker, Grossman, &; Murphy, 1991) introduced the concept that the consumer will respond to changes in the future by changing his or her current behavior. If there is an increase in prices in the future, then for goods that are addictive, the current consumption will be lowered with the aim of maintaining consistency in the amount consumed. Consumers realize that with future increases, their ability to purchase these goods will decrease. This behavior continues to repeat over time, seeing that current consumption is influenced by consumption in the past, and current consumption will affect consumption in the future. This behavior is also known as "*forward looking consumer*".

Furthermore, Showalter (1999) perfected the concept of "*forward looking*" for addictive goods which states that the behavior is not only carried out by consumers as decision makers, but also by producers. Producers have the decision to determine how much addictive goods will be produced taking into account the changes in "*intertemporal profit*" that the company has due to future changes. Future changes may occur due to the announcement of government tariff increases, restrictions on the use of addictive goods and other policies that affect the consumption of addictive goods. The producer will calculate the change in marginal profit today with marginal profit in the future. This concept explains why producers are willing to lower current prices to obtain a high current consumption base, which will be used as a consumption base in the future. The increase in the current consumption base is closely related to the forestalling pattern that will be carried out by the company.

Forestalling is carried out as one of various anticipatory measures by manufacturers against future tariff increases (Ross et al., 2017). Other efforts include moving to lower tiers (taking the case in Indonesia), which is a form of tax avoidance in response to high tariff increases. Gaps in the rules that allow manufacturers to switch tiers depending on production scale encourage companies to determine the total production that would maximize profits. If reducing total production can lower tax burdens while yielding higher profits, manufacturers may choose to shift to a lower tier with a smaller tax burden. Futhermore, there is tax incidence, which can take the form of overshifting, fullshifting and undershifting.

Companies, in anticipation of excise tax increases, adjust cigarette prices through the implementation of tax incidence, which is passed on to consumers in the form of overshifiting, undershifting or fullshifting. In an oligopolistic market like Indonesia, tax incidence tends to overshift. Companies employ overshifting to proactively counter an increase in the Retail Selling Price. Their goal is to sell cigarettes above the government-set Retail Selling Price limit, with the expectation of introducing new cigarettes that can be marketed at the minimum Retail Selling Price. This strategy is adopted because cigarette prices must not decrease from the initial production stage.

The difference in tariff increases between tiers is a consideration for companies to determine how much tax incidence will be carried out. In the event that the increase in rates charged to higher tiers is of smaller value, the tax incidence burden received by the lower class becomes greater. This is a disincentive for lower-tier companies to increase prices in the future. Consumers in determining the cigarettes to be consumed will depend on the percentage increase in cigarettes. If the difference between the price of expensive and cheap cigarettes is

getting smaller, the company will also consider returning to consume more expensive cigarettes if the additional utility obtained to consume cigarettes at a more expensive price is greater than the price difference between tiers

Before the implementation of the multitier specific tariff in 2009, there were 9 tiers for the production types of Machine-Made Clove Cigarettes, Machine-Made White Cigarettes, and Hand-Rolled Clove Cigarettes. Subsequently, the number of tiers increased to 19. The government took this step with the aim of protecting labor-intensive industries from the threat of modernization in cigarette production. The addition of these tiers resulted in a wide range of tariff and price variations, resembling the pricing diversity found in the ad valorem system. This number of tiers persisted until 2011. Later, in 2013, the government began to simplify the number of tiers gradually, reaching 10 tiers by 2018.

3. RESEARCH METHODS
3.1 Data Sources
The data to be used is excise tape ordering data (CK-1) obtained from the Directorate General of Taxes (DJBC) consisting of 9 (nine) years as research observations, from 2009 to 2017.

3.2 Empirical Specification
There is a limited knowledge on forestalling-related topic etiher theoretically or empirically. Ross, Tesche & Vellios (2017) explained descriptively *that forestalling behavior* is a decision taken by cigarette manufacturers in an annual period, which occurs before the implementation of new excise tariffs.

So the author proposes an empirical model to examine the forestalling behavior of the cigarette industry with the following model:

$$
\begin{aligned}
GAPPRO_{it} = \beta_0 &+ \beta_1 GAPTARIF_{it} + \beta_2 GAPHJE_{it} \\
&+ \beta_3 GAPLIMITPRO_{it} + \beta_4 WKT\_PGMN_{it} + \beta_5 WKT\_PGMN_{it}^2 \\
&+ \beta_6 D\_SIMPLY_{it} + \beta_7 D\_UBAHBTSPRO_{it} \\
&+ \beta_8 D\_GOL_{it} + \beta_9 D\_JNSROKOK_{it} \\
&+ \beta_{10} GAPTARIF * WKT\_PGMN_{it} \\
&+ \beta_{10} GAPHJE * WKT\_PGMN_{it} + \varepsilon_{it}
\end{aligned}
$$

with the following information:

$GAPPRO$	: Difference in orders of excise tape after and before government announcement (%)
$GAPTARIF$	: Difference in excise rates after and before government announcement (%)
$GAPHJE$	: Retail Selling Price (HJE) difference after and before government announcement (%)
$GAPLIMITPRO$	: difference in total production in a year and established production limit (%)
WKT_PGMN	: Time of Government Announcement with Effective Implementation of New Government Policy (Sunday)
WKT_PGMN^2	: Government announcement time (square) with the effective implementation of the new government policy (weeks) to obtain the maximum announcement time
D_SIMPLY	: *dummy* government policy related to simplification of groups (tier)

$D\_UBAHBTSPRO$: *dummy* government policy related to changes in production scale limits for tier determination

D_GOL : *dummy* classification of brands (tier) based on production limits

$D\_JNSROKOK$: *dummy* classification of brands (tier) based on cigarette type

$GAPTARIF * WKT\_PGMN$: the interaction between the difference in the percentage increase in excise rates and the time of announcement

$GAPHJE * WKT\_PGMN$: the interaction between the percentage difference in the increase in Retail Selling Price and the time of announcement

The dependent variable is $GAPPRO$, representing the percentage difference in production before and after the government announcement, expressed as a percentage of the average monthly production. To calculate the percentage before the government announcement, the total production before the announcement is divided by the total production in a year. The resulting value is then multiplied by 100% and divided by the number of months before the announcement. The percentage after the announcement is calculated similarly. The GAPPRO value is determined by subtracting the average monthly value after the announcement from the average monthly value before the announcement. A positive difference indicates an increase in the average monthly demand for excise tape after the announcement compared to the average monthly demand before the announcement, signifying forestalling. The magnitude of forestalling by the company is proportional to the percentage of this positive difference; a higher percentage implies a greater degree of forestalling.

$$GAPPRO = \left\{ \frac{\left(\frac{Production\ before\ announcement}{Production\ Total\ in\ 12\ month} \times 100\%\right)}{Total\ Month\ after\ announcement} - \frac{\left(\frac{Production\ after\ announcement}{Production\ Total\ in\ 12\ month} \times 100\%\right)}{Total\ Month\ before\ announcement} \right\}$$

The independent variables in this study were conducted based on the environment of Indonesia's excise structure determined from each policy issued by the government every year, namely:

a. $GAPTARIF$ is the main independent variable obtained from the percentage difference between the current prevailing excise rate and the excise rate announced by the government for the next period. The greater the percentage increase in excise rates, the greater the degree of *forestalling.*

b. $GAPHJE$ is the percentage difference between the current Retail Selling Price limit and the Retail Selling Price limit announced by the government for the next period. The assumption that occurs in this minimum selling price policy is that the greater the positive difference between the prices set by the government, the greater the degree of *forestalling* carried out by the company.

c. $GAPLIMITPRO$ is the difference between the company's total production production in the current year and the production limits of the group above. The assumption in this variable is that the higher the gap or difference in the company's total production production in the current year with the production limit of the group above, the higher the degree of *forestalling* carried out.

d. WKT_PGMN is the time difference between the government announcement and the effective implementation of the policy. The announcement time gap provides companies with an opportunity to plan their excise tape purchasing strategy. If the

announcement and implementation periods are distant, companies can evenly distribute their excise tape orders each month, with quantities not significantly different from the previous month. Conversely, if the gap is very short, companies have no chance to place sudden large orders. The unit of this announcement time gap is in weeks, providing a range for variations in the difference between the announcement and effective implementation periods.

e. WKT_PGMN^2 is the square of the time difference between a government announcement and the effective enactment of the policy. The value of this variable will be used to determine the maximum time for the highest degree of forestalling. The assumption is that if the announcement time is either too close or too far from the effective implementation of the excise tax, the degree of forestalling becomes smaller. The unit of this announcement time difference is in weeks, providing a range for variations in the difference between the announcement and effective implementation periods.

f. D_SIMPLY is a *dummy* implementation of government policies related to group simplification. This tier simplification policy was carried out in 2012, 2013, 2015 and 2018. For the group (tier) affected by this simplification policy is worth 1, while for other groups it is worth 0. This will force the tier at the bottom to do forestalling, because the tariff charged becomes much higher than the tier that was previously built The assumption built is that with the simplification policy, *forestalling* is getting bigger, but at the tier that is in the lower class.

g. $D\_UBAHBTSPRO$ *dummy* policies carried out by the government related to changes in production limits for tier I and tier II. This policy was issued by the government in 2016 which was implemented in 2017. For the period before the implementation of the policy in the form of *a dummy* value of 1, namely 2016 and other years worth 0.

h. D_GOL is a *dummy* group of companies that present the size of the company and the type of excisable goods. The higher the group and market controlled, the greater the degree of *forestalling* due to the company's ability to purchase additional excise tape. The basis in this *dummy* is a company that is in Group III.

i. $D\_JNSROKOK$ is a *dummy* classification of brands based on the type of cigarette. The cigarette market in Indonesia is an oligopoly market which is controlled by large companies with the largest total production order being SKM, SPM and SKT. The basis for this *dummy* is the type of SKT cigarette.

j. $GAPTARIF * WKT\_PGMN$ is the interaction between the difference in the percentage increase in excise rates and the timing of the announcement. The value of this variable will be used to determine the relationship between the rate increase and the timing of the announcement. The higher the tariff and the further away the announcement time will be, the smaller the *forestalling* will be because companies have a long time to consider other strategies to anticipate a decrease in consumption at the time of the introduction of new excise tariffs.

$GAPHJE * WKT\_PGMN$ is the interaction between the difference in the percentage increase in retail selling prices and the timing of the announcement. The value of this variable

will be used to determine the relationship between the increase in retail selling price and the timing of the announcement. The higher the retail selling price and the further away the announcement time will be, the *smaller the forestalling* will be because companies have a long time to consider other strategies to adjust the new retail price set by the government, because consumers are more sensitive to reduce their consumption if cigarette prices rise.

3.3 Estimation Methods

The data structure used in this study is the panel data structure. Therefore, the author uses a simple panel data estimation method, namely Fixed Effect regression or Random Effect. To determine which model provides the best estimator, the authors will use the Hausmann Specification Test. Testing and estimation were performed using the STATA 13.0 application

4. ANALYSIS AND DISCUSSION

4.1 Description of statistics

In the research data there were 4,165 brands that carried out *forestalling* in the period 2009 to 2017. Most of the cigarette products produced are Hand-Rolled Clove Cigarettes (SKT), Machine-Rolled Clove Cigarettes (SKM) and Machine-White Cigarettes (SPM) respectively, namely 8,596, 4283 and 804 brand observations. The highest percentage increase in production (Gappro) was 49.7 percent and the lowest was -14.2%, with an average of 45.1%. The highest percentage of tariff increase (Gaptarif) was 62.5% and the lowest was 0%, with an average of 16.2%. And for the highest percentage increase in retail selling price (GapHJE) of 81.3% and the lowest of -37.5%, with an average of 61.8%. For the announcement time no later than 22 weeks and no earlier than 7 weeks from the effective date of the new excise tariff.

The degree of forestalling in the multitier-specific excise structure in Indonesia will be seen from the change in the percentage increase in average monthly excise band bookings after the government announcement minus the percentage of average monthly excise band orders before the government announcement. Changes in the degree of forestalling can be determined from the percentage increase in excise rates, the percentage increase in retail selling price limits, the interaction between the percentage of tariff increases and the timing of announcements, the interaction between the percentage increase in retail selling prices and the time of announcement, the difference in the time of announcement and effective enforcement, simplification policies and production limit change policies carried out by the government. From the descriptive statistics displayed (Table 4.1), it can be seen that on average the trend gap of production carried out tends to be consistent every year between 3 to 6 percent, while the increase in excise rates has increased more varied, as well as for retail selling prices. However, this still needs to be further analyzed using econometrics to make it clearer to see the degree of forestalling that occurs in Indonesia in each period by looking at changes and developments in tariffs and government policies that have been implemented.

Table 4.1 Descriptive Statistics of Research Data

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Production Gap (%)	6.8%	5.4%	4,7%	5.8%	0%	4.6%	5.3%	3.4%	4.7%
Gap Rate (%)	49%	22.7%	19.4%	7.5%	0%	7.8%	6.8%	6.7%	10.6%
Gap HJE (%)	-	-	-0.3%	13,9%	0%	15.2%	26.4%	11%	-1.5%

Source : processed by author

In table 4.1, it can be seen from the statistics that the average production gap from year to year tends to be positive with varying values. The highest production gap occurred in 2009 with an average value of 6.5 percent. Tariff increases also occur every year with the highest average tariff increase in 2009. And for retail selling price increases began to occur in 2011 with the highest average tariff increase in 2015. In 2013 there was no increase in excise rates and retail selling prices because the government implemented local taxes in exchange for the increase in excise rates

Figure 4.1 Average Order of Excise Tape Before and After Government Announcement
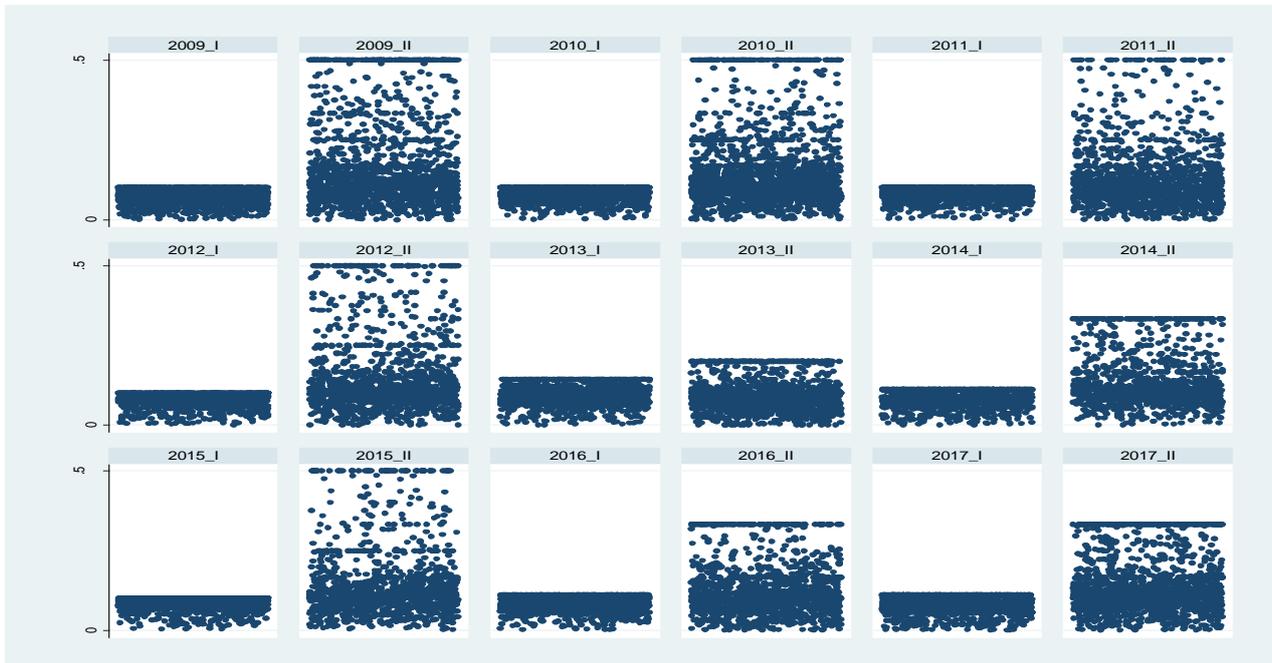
Source : processed by author

Figure 4.1 shows the average monthly comparison between excise tape orders before the announcement and after the government announcement for each unit of brand analysis. Period I (one) in the picture is the period of ordering excise tape made by the company before the announcement of the increase in excise rates, while period II (two) is carried out after the announcement of the increase in excise rates. Every year there is a positive difference between period I and period II, where most of the percentage values in period II are greater than period I. In the period 2009, 2010, 2011, 2012 and 2015 the average difference in orders for excise bands in period II to period I tends to be greater than in other years. While the lowest difference in excise tape orders occurred in 2013. This can happen because in 2013 the government did not issue a policy to increase excise rates, because the government issued another policy, namely by imposing local taxes on mangrove products.

4.2 Estimated Results

This research related to the analysis of forestalling behavior of the cigarette industry in Indonesia uses *Unbalanced Panel data,* because there is a possibility that a brand exists and does not do *forestalling* in the research year period. This can happen because the current brand may not appear again in the next period because the company that produces the cigarette brand is no longer operating either for bankruptcy reasons or blocked by customs and excise officials

for violations. In fact, as one form of the company's strategy to be able to sell cigarettes at more affordable prices in all layers of consumption, there is a possibility of the emergence of new brands in the research period. The new brand can appear, because of the rules that do not allow lowering prices on the old brand. The brand also does not always place orders in either the month before the announcement or in the month following the announcement of government policy. Models that can be used to estimate *unbalanced panel* data are *fixed* effect or *random effect models.* And the model chosen based on the *Hausman Spesification Model Fixed Effect and Random Effect* test is a *fixed effect* model because it provides a more efficient estimator (annex 4). The results of the estimation can be seen in table 4.2

Table 4.2 Estimation Results

VARIABLE INDEPENDENT	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
GAPTARIF	0.092***	0.092***	0.095***	0.021	0.006	0.007
	(0.007)	(0.007)	(0.007)	(0.017)	(0.017)	(0.017)
GAPTARIF*WKT_PGMN	-0.001***	-0.001***	-0.001***	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GAPHJE		0.022	0.026*	-0.101***	-0.091***	-0.090***
		(0.014)	(0.014)	(0.023)	(0.024)	(0.024)
GAPHJE*WKT_PGMN		-0.000	-0.000	0.001***	0.001***	0.001***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GAPLIMITPRO			-0.037***	-0.030***	-0.030***	-0.036***
			(0.006)	(0.006)	(0.006)	(0.006)
WKT_PGMN				-0.015***	-0.012***	-0.012***
				(0.002)	(0.002)	(0.002)
WKT_PGMN²				0.0004***	0.0003***	0.0003***
				(0.000)	(0.000)	(0.000)
D_SIMPLY					-0.018***	-0.017***
					(0.006)	(0.006)
D_UBAHBTSPRO					-0.011**	-0.011**
					(0.004)	(0.004)
D_Gol1						-0.045***
						(0.015)
D_Gol2						-0.030***
						(0.009)
D_SKM						-0.044
						(0.033)
D_SPM						-0.080**
						(0.037)
Konstan	0.050***	0.049***	0.018***	0.126***	0.112***	0.184***
	(0.001)	(0.002)	(0.005)	(0.016)	(0.017)	(0.037)
Number of Observations	12,499	12,499	12,499	12,499	12,499	12,499
R-squared	0.049	0.050	0.054	0.060	0.062	0.064
Number of Brands	4,165	4,165	4,165	4,165	4,165	4,165

Source : STATA output. Standard *error* values in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4.2 presents the estimation results to see the effect of the complexity of the excise tariff structure in Indonesia on the degree of *forestalling* carried out by cigarette brands. The estimation results in models 1, 2 and 3 show a consistent positive correlation to the degree of *significant forestalling* in $\alpha = 1\%$. Using the results in model 3, the *GAPTARIF* coefficient of 0.095 shows a positive relationship between tariffs and degrees of forestalling, where an increase in rates of 1% is associated with an increase in the degree of *forestalling* by 9.5%.

This shows that the increase in tariffs has a major effect on *forestalling*. This is common because an increase in tariffs will encourage companies to increase prices in the future, which means a consequent decrease in consumption.

The second independent variable is the interaction between the rate and the timing of the announcement. The estimation results of models 1, 2 and 3 show consistency of negative correlation to significant *degree of forestalling* in $\alpha = 1\%$. Using the results in model 3, the *GAPTARIF coefficient*WKT_PGMN* of -0.001 shows a negative relationship between tariffs and degrees of forestalling, where an increase in rates of 1% is associated with a decrease in the degree of *forestalling* by 1%. High rates and long announcement times can reduce *forestalling*.

The next independent variable of concern is the percentage increase in Retail Selling Price set by the government. The estimation results in models 4, 5 and 6 show a consistent positive correlation to the degree of significant forestalling while in model $\alpha = 1\%$, 3 significant in Using the results in model 6, the $\alpha = 10\%$. *GAPHJE* coefficient of -0.090 shows a negative relationship between the Retail Selling Price and the degree of *forestalling* , where an increase in rates of 1% is associated with a decrease in degrees *forestalling* by 9%.

The fourth independent variable is the interaction between the retail selling price and the timing of the announcement. The estimation results in models 4, 5 and 6 showed a positive correlation to the degree of *significant forestalling* in $\alpha = 1\%$. Using the results in model 6, the *GAPHJE*WKT_PGMN* coefficient of 0.001 shows a positive relationship between retail selling price interactions and the timing of announcements on the degree of forestalling, where an increase in interaction of 1% is associated with an increase in the degree of *forestalling* by 1%.

The next independent variable used is the difference between the scale limit of tier production with the total amount of production that has been done by the brand in the company. The estimation results in all models show a consistent negative correlation to the degree of significant forestalling in By using the results in model 6, the *GAPLIMITPRO* coefficient of $\alpha = 1\%$. -0.036 shows a negative relationship between the production scale limit and the degree of forestalling, where an increase in the difference between production limits and the company's total production of brands by 1% is associated with a decrease in the degree of *forestalling* by 3.6%.

The sixth independent variable is the time difference between the announcement and the effective implementation of the new excise rate. The estimation results in all models showed a consistent negative correlation to the degree of *significant forestalling* in $\alpha = 1\%$. Using the results in model 6, the WKT_PGMN coefficient of -0.012 shows a negative relationship between the difference in announcement time and the degree of forestalling, where the addition of the time difference for 1 week is associated with a decrease in the degree of *forestalling* by 1.2%. This shows that the longer the announcement time with effective enforcement, companies can set strategies to be able to control customs tape orders more calmly.

The seventh independent variable is the squared time difference between the announcement and the effective implementation of the new excise rate. The estimation results in all models showed a consistent positive correlation to the degree of *significant forestalling*

in $\alpha = 1\%$. Using the results in model 6, the coefficient of WKT_PGMN^2 is 0.0003 indicating a positive relationship between the squared difference of announcement time and the degree of *forestalling*. To determine the maximum announcement time, it can be calculated using the equation : $\frac{-WKT\_PGMN}{2WKT\_PGMN^2}$, resulting in a value of 20. This implies that the degree of *forestalling* will be maximized if the government announces an excise rates increase in the 20th week before the effective implementation of the new excise rate.

The next control variable is *dummy* simplification. The estimation results in all models showed a consistent negative correlation to the degree of *significant forestalling* in $\alpha = 1\%$. Using the results in model 6, the D_SIMPLY coefficient of -0.017 shows a negative relationship between simplification policies carried out by the government and the degree of forestalling associated with a decrease in the degree of *forestalling* by 1.7%. The estimation results show that the government's policy of simplification is quite successful. Simplification contributes to reducing the degree of forestalling, so this policy can reduce the negative impacts of *forestalling*

The next control variable is the *Dummy* of the government's policy to raise production limits for group I and group II which was carried out in 2016. The estimation results in all models showed a consistent negative correlation to the degree of *significant forestalling* in $\alpha = 5\%$. Using the results in model 6, the D_UBAHBTSPRO coefficient of -0.011 shows a negative relationship between the government's policy of changing production limits for tier determination and the degree of forestalling associated with a decrease in the degree of *forestalling* by 1.1%. This is reasonable considering that companies in the upper tier are now incentivized to get lower tax rates and Retail Selling Price limits in the future. With these incentives, companies tend to discourage their intention to do *forestalling*.

The next independent variable of control is the *dummy* of the company by production group. For *D_Gol*, the estimation results show a negative correlation to the degree of *significant forestalling* in $\alpha = 1\%$ both group I and group II companies using the basis of group III companies. Using the results in model 7, the D_Gol1 coefficient of -0.045 and in *D_Gol2* of -0.030 shows a negative relationship between the production group and the degree of *forestalling* associated with a decrease in the degree of *forestalling* by brands in group I and group II by 4.5% and 3% respectively compared to companies in group III. This may happen judging from the number of brands in group III compared to brands in groups I and II. It could be that in terms of the number of units, the order of excise bands in production group I and group II is higher than that of group III, but if calculated as a percentage, group III can more easily do *forestalling* because the amount of excise tape purchases is relatively small.

The last independent variable of control is the dummy of the enterprise by type of production. For *D_JNSROKOK*, the estimation results show a negative correlation to the degree of significant forestalling in the $\alpha = 5\%$ SPM brand using the SKT brand base. Using the results in model 6, the *D_JNSROKOK* coefficient for SPM of -0.080 shows a negative relationship of production groups to the degree of forestalling associated with a decrease in the degree of forestalling by brands in SPM by 8%. compared to the SKT brand.

5. CONCLUSIONS

This research looks at the behavior of companies under various conditions in a multitier-specific structure in Indonesia. Changes in tariffs, limits on Retail Selling Prices, timing of announcements, simplifications and changes in production limits for tier determination provide incentives and disincentives for companies to determine excise tape purchase policies before the implementation of the new rules. If the policy provides better incentives to companies in the future, then companies are not interested in forestalling. Conversely, if the policy encourages a decrease in profits for the company in the future, then the company will try to keep the losses that will be faced can be minimized. The explanation of each government policy is as follows:

a. The tariff increase is dissentive for companies, thus encouraging companies to do forestalling. Tariff increases result in price increases in the future so that companies will tend to keep cigarettes that are still attached to old excise bands to be sold in the following year to cover the decline in profits due to decreased consumption. In addition, with forestalling, companies can apply increasing smoothing prices and increase the consumption base.

b. The increase in retail selling prices should be a distraction for companies so as to encourage forestalling because the price set by the government is a dead price that cannot be lowered. In contrast to tariff increases that can be withheld by companies with greater tax incidence to producers (undershifting). The reality is that the Retail Selling Price circulating in the community far exceeds the Retail Selling Price set by the government, so the company is not too affected by the determination of the Retail Selling Price.

c. The timing of the announcement varies in response by each tier group and type of cigarette. The longer the announcement time, the less likely companies are to do forestalling because companies can consider using other strategies in anticipation of any policy changes set by the government. Companies are likely to maximize forestalling in week 8 to week 20 before the effective implementation of the new excise rate (January 1).

d. Production differences and production limits within smaller companies influence companies not to do forestalling, because companies will try to keep their production in the group of companies that impose lower excise rates.

e. The time difference between the announcement and the effective implementation of excise rates affects the degree of forestalling. The long period of time provides an opportunity for companies to consider various strategies in anticipation of certainty changes in government policies in the future. Companies are not only doing forestalling, but can also consider other strategies.

f. Government policy simplification becomes an incentive and disincentive for each tier that will be merged. In reality, the simplification policy also reduces the degree of forestalling. For companies in the upper tier, with the simplification downward, they benefit from lower tariff rates and retail price limits. Consequently, these companies are not motivated to engage in forestalling. On the other hand, companies in the lower tier are more likely to resort to forestalling because they bear a larger burden of tariffs and retail price determinations.

g. Government policy changes to production limits also serve as incentives and disincentives for each tier experiencing alterations in production limits. For companies previously

classified in the upper-tier group, an increase in production limits becomes an incentive. This allows such companies to obtain lower tariff rates and retail price limits, thereby diminishing the motivation for engaging in forestalling practices. However, for companies previously in the lower tier, the increased number of competitors poses a threat that may shrink their consumer base in the future.

6. LIMITATIONS AND SUGGESTIONS

Policy advice for the government, that every policy taken is to pay attention to the ability of people's purchasing power, focus on controlling consumption and improving public health. The rule limiting the maximum tariff by 57% pressures the government room to increase excise rates, and even almost all cigarettes are far below the maximum limit. The WHO's suggestion that a minimum of 57% could be considered for future policy changes. The increase in Retail Selling Price also considers the selling price of brands in the market, where the Retail Selling Price in the community tends to be greater than the Retail Selling Price set by the government. Determination of Retail Selling Price is important because consumers are more sensitive to price increases compared to tariff increases. Tariff increases can not be entirely transferred to consumers, but can be borne in part by producers (undershifting). The time difference between announcements can be done in two ways, namely by announcing tariff changes programmatically in the long term, or by applying with a very short time difference. The simplification policy can be continued because it has a better influence in reducing the amount of forestalling and makes it easier for the government to monitor cigarette prices in the market. For simplification, it continues to refer to higher tiers because it will further reduce consumer efforts to switch to cigarettes sold at low prices.

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Annex 1

Layer of Cigarette Excise Tariff in Indonesia

Type	Production (stick/year)	Group	Retail Selling Price Rp/Stick	2009	2010	2011	Retail Selling Price Rp/Stick	2012	Retail Selling Price Rp/Stick	2013	2014	Production (stick/year)	Retail Selling Price Rp/Stick	2015	Retail Selling Price Rp/Stick	2016	Production (stick/year)	Retail Selling Price Rp/Stick	2017	Retail Selling Price Rp/Stick	2018
SKM (Machine-Made Clove Cigarettes)	> 2.0 Billion	I	> 660	290	310	325	> 660	355	> 669	375	375	> 2.0 billion	> 800	415	> 1000	480	> 3.0 billion	> 1120	530	> 1120	590
			630 < x < 660	280	300	315	630 < x < 660	345	631 < x < 669	355	355										
			600 < x < 630	260	280	295	600 < x < 630	325													
	< 2.0 billion	II	> 430	210	230	245	> 430	270	> 549	285	285	< 2.0 billion	> 588	305	> 740	340	< 3.0 billion	> 820	365	> 895	385
			380 < x < 430	175	195	210	374 < x < 430	235	440 < x < 549	245	245		511 < x < 588	265	590 < x < 740	300		655 < x < 820	335	715 < x < 895	370
			374 < x < 380	135	155	170															
SPM (Machine-Made White Cigarettes)	> 2.0 billion	I	> 600	290	310	325	> 375	365	> 680	380	380	> 2.0 billion	> 820	425	> 930	495	> 3.0 billion	> 1030	555	> 1130	625
			450 < x < 600	230	275	295															
			375 < x < 450	185	225	245															
	< 2.0 billion	II	> 300	170	200	215	> 300	235	> 444	245	245	< 2.0 billion	> 520	270	> 800	305	< 3.0 billion	> 900	330	> 935	370
			254 < x < 300	135	165	175	254 < x < 300	190	345 < x < 444	195	195		425 < x < 520	220	505 < x < 800	255		585 < x < 900	290	640 < x < 935	355
			217 < x < 254	80	105	110	217 < x < 254	125													
SKT (Hand-rolled Clove Cigarettes)	> 2.0 billion	I	> 590	200	215	235	> 590	255	> 749	275	275	> 2.0 billion	> 825	290	> 1115	320	> 2.0 billion	> 1215	345	> 1260	365
			550 < x < 590	150	165	180	520 < x < 590	195	550 < x < 749	205	205		606 < x < 825	220	775 < x < 1115	245		860 < x < 1215	265	890 < x < 1260	290
			520 < x < 550	130	145	155															
	0.5-2.0 billion	II	> 379	90	105	110	> 379	125	> 379	130	130	0.35-2.0 billion	> 417	140	> 605	155	0.5-2.0 billion	> 730	165	> 470	180
			349 < x < 379	80	95	100	349 < x < 379	115	349 < x < 379	120	120		385 < x < 417	125	430 < x < 605	140		470 < x < 730	155		
			336 < x < 349	75	90	90	336 < x < 349	105	336 < x < 349	110	110										
	<0.5 billion	III	> 234	40	65	65	> 234	75	> 250	80	80	0.05-0.35 billion	> 286	85	> 400	90	0.01-0.5 billion	> 465	100	> 400	100
												<0.05 billion	> 286	80	> 370	80	<0.01 billion	>400	80		
Number of Tiers				19	19	19		15		13	13			12		12			12		10

Information:

🟩 Simplification

🟥 Layer addition

Estimation Results Per Production Group

INDEPENDEN VARIABEL	Group I	Group II	Group III
GAPTARIF	0.588***	0.147**	0.026
	(0.210)	(0.074)	(0.021)
*GAPTARIF*WKT_PGMN*	-0.009***	-0.002**	0.000
	(0.003)	(0.001)	(0.000)
GAPHJE	-0.065	-0.303***	0.065
	(0.052)	(0.039)	(0.041)
*GAPHJE*WKT_PGMN*	0.001	0.003***	-0.000
	(0.001)	(0.001)	(0.000)
GAPLIMITPRO	0.024	-0.041***	-0.050***
	(0.060)	(0.014)	(0.008)
WKT_PGMN	-0.009	-0.029***	-0.001
	(0.007)	(0.004)	(0.004)
WKT_PGMN^2	0.001**	0.001***	-0.000
	(0.000)	(0.000)	(0.000)
D_SIMPLY	0.011	0.027**	-0.026***
	(0.018)	(0.013)	(0.008)
D_UBAHBTSPRO	-0.007	-0.010*	-
	(0.009)	(0.005)	
D_SKM	-	-0.048	-
		(0.032)	
D_SPM	-	-0.100*	-
		(0.055)	
Konstan	0.060	0.242***	0.020
	(0.071)	(0.039)	(0.026)
Number of Observations	677	4,659	7,163
R-squared	0.062	0.087	0.065
Number of Brands	197	1,446	2,647

Standard Error Value in parantheses, * $p<0,10$, ** $p<0,05$, *** $p<0,01$.
Source : STATA output

Estimation Results Per Ciggarette Type

INDEPENDEN VARIABEL	SKM (Machine-Made Clove Cigarettes)	SPM (Machine-Made White Cigarettes)	SKT (Hand-Made Clove Cigarettes)
GAPTARIF	0.409***	0.184	0.021
	(0.154)	(0.187)	(0.020)
*GAPTARIF*WKT_PGMN*	-0.007***	-0.002	0.000
	(0.002)	(0.002)	(0.000)
GAPHJE	-0.329***	0.012	0.031
	(0.064)	(0.063)	(0.036)
*GAPHJE*WKT_PGMN*	0.004***	-0.000	0.000
	(0.001)	(0.001)	(0.000)
GAPLIMITPRO	-0.038**	0.070**	-0.045***
	(0.015)	(0.027)	(0.007)
WKT_PGMN	-0.033***	0.012	-0.004
	(0.005)	(0.011)	(0.003)
WKT_PGMN^2	0.002***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
D_SIMPLY	-0.022	-0.022	-0.019***
	(0.024)	(0.046)	(0.007)
D_UBAHBTSPRO	0.002	-0.035***	-
	(0.008)	(0.009)	
D_GOL1	-0.023	0.114***	-0.102***
	(0.018)	(0.021)	(0.028)
D_GOL2	-	-	-0.033***
			(0.010)
Konstan	0.210***	-0.028	0.044*
	(0.039)	(0.079)	(0.022)
Number of observations	3,952	767	7,780
R-squared	0.091	0.123	0.062
Number of Brands	1,271	195	2,736

Standard Error Value in parantheses, * $p<0,10$, ** $p<0,05$, *** $p<0,01$.

Source : STATA output

Annex 4
Estimation Results per Year

INDEPENDEN VARIABEL	2009	2010	2011	2012	2013	2014	2015	2016	2017
GAPTARIF	-	-	-	-	-	-	-	-	-
*GAPTARIF*WKT_PGMN*	0.015***	0.007**	0.001	0.001	-	0.002	-0.004*	-0.004*	0.003***
	(0.005)	(0.003)	(0.001)	(0.002)		(0.002)	(0.002)	(0.002)	(0.001)
GAPHJE	-	-	-	-	-	-	-	-	-
*GAPHJE*WKT_PGMN*	-	-	-0.001	0.003**	-	0.000	-0.002***	-0.002***	0.001
			(0.002)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
GAPLIMITPRO	-0.041***	-0.036***	-0.024*	-0.081***	-0.002	-0.062***	-0.042***	-0.042***	-0.038***
	(0.014)	(0.012)	(0.013)	(0.018)	(0.009)	(0.013)	(0.010)	(0.010)	(0.010)
WKT_PGMN	-	-	-	-	-	-	-	-	-
WKT_PGMN²	-	-	-	-	-	-	-	-	-
D_SIMPLY	-	-	0.026	-0.023	-	-0.056**	-	-	-0.066***
			(0.048)	(0.050)		(0.027)			(0.024)
D_UBAHBTSPRO	-	-	-	-	-	-	-	-	-
D_Gol1	0.333**	0.145**	-0.011	-0.013	0.024***	-0.051***	-0.029	-0.029	-0.020
	(0.136)	(0.067)	(0.020)	(0.019)	(0.009)	(0.016)	(0.023)	(0.023)	(0.013)
D_Gol2	0.314***	0.143**	-0.006	0.000	-0.000	-0.024	-0.031	-0.031	0.007
	(0.117)	(0.065)	(0.015)	(0.015)	(0.008)	(0.016)	(0.021)	(0.021)	(0.011)
D_SKM	0.114***	0.020	0.024*	0.082***	0.017***	0.045***	0.026*	0.026*	0.063***
	(0.039)	(0.014)	(0.014)	(0.029)	(0.006)	(0.012)	(0.014)	(0.014)	(0.012)
D_SPM	0.064*	0.040**	0.009	0.099**	0.019**	0.008	-0.008	-0.008	0.080***
	(0.034)	(0.019)	(0.018)	(0.039)	(0.009)	(0.016)	(0.018)	(0.018)	(0.025)
Konstan	-0.479***	-0.189**	0.006	-0.118***	-0.022*	-0.035	0.089***	0.089***	-0.070***
	(0.183)	(0.079)	(0.021)	(0.042)	(0.012)	(0.030)	(0.026)	(0.026)	(0.023)
Number of Observations	1,475	1,641	1,420	1,263	1,458	1,105	1,210	1,210	1,493
R-squared	0.021	0.019	0.015	0.042	0.014	0.062	0.052	0.052	0.055

Standard Error Value in in parantheses, * $p<0,10$, ** $p<0,05$, *** $p<0,01$.
Source : STATA output