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## **THE INFLUENCE OF TOBACCO REGULATION TO TOBACCO INDUSTRY SUSTAINABILITY**

### **Abstract:**

The Minister of Finance Regulation (PMK) No. 146/PMK.010/2017 brings pro and cons in the national economy. The interest of government and industry should be taken into consideration. This paper will explore the impact of PMK implementation to tobacco excise revenue, production volume and industry performance. Minister of Finance Regulation (PMK) No. 146/PMK.010/2017 regarding the simplification of cigarettes tiers. Those policy threatened the sustainability of the Tobacco Industry and national excise revenue. As the strategic industry due to its roles in national revenue, employment creation and its value as industrial heritage in Indonesian history, it needs to be explored. This study aims to analyze the impact of PMK No.146/2017 to the tobacco industry by considering people purchasing power.

Simulation model with three different scenarios is used to prevail the effect of the regulation to volume products of tobacco industry. Obtaining more details analyses, Focus Group Discussion (FGD) with the stakeholders, e.g., tobacco association, Ministry of Finance, researcher and journalist have been also conducted.

The findings of this study showed, first, simplification of the price tiers of cigarettes will decrease the cigarettes production about 20 percent under lower purchasing power assumption. Second, the simplification will make the tobacco excise revenue fall by 2.4 percent under lower purchasing power assumption. Third, simplifying tiers will increase tobacco excise revenue by 8.5 percent under higher purchasing power. Under strategic industry policy, government policy on tobacco industry should take into consideration some factors such as production volume, national revenue and industry performance. Besides, the government should design others alternative of excise tax objects such as plastic, chlorofluorocarbon/CFC, fuel, luxury goods and sugar products.

### **Keywords:**

tobacco industry, excise tax, cigarettes tiers, simulation

**JEL Classification:** E27, E61, H20

## INTRODUCTION

Tobacco industry has a strategic role in Indonesian economy. This strategic role is shown by its contribution to the state revenue that reaches 11% of the total tax revenue and provide the employment of around 6 million workers. Tobacco industry also has a large *linkage* to job creation in other economic sectors, for 2.9 million retail traders, 150 thousand cigarette factory workers, 60 thousand factory employees, 1.6 million clove farmers and 2.3 million tobacco farmers (Indonesian Customs and Excise, 2019).

As a product that is limited in consumption and is strategic for the state revenue, the sustainability of tobacco industry is very important. In 2017, the government issued a step-by-step tier simplification policy for the next three years and a combined quota set forth in Ministry of Finance Regulation (MFR) No. 146/2017. In its journey, this policy received a lot of criticism from various parties because it was considered detrimental to the sustainability of tobacco industry. Therefore, in 2018, the government issued MFR No. 156/2018 which removed the rules issued in MFR No. 146/2017 regarding the implementation of tier simplification. The presence of MFR No. 156/2018 is expected to be a middle ground between the producers, the government and all parties involved in tobacco industry circle.

Since 2012, the tier simplification policy for cigarettes had been started from 19 groups to 15 groups. In its development, almost every year, the tier simplification policy of cigarettes continues to be carried out by the government, where today, cigarettes are grouped into only 10 tiers. Over the past few years, data shows that tobacco industry production portrays a declining *trend* in the production volume and also a decrease in the production growth as a result of the tier simplification policy for cigarettes. Based on the data from the Directorate General of Customs and Excise (2019), it shows that the decrease in production volume from 2014 is quite significant, which is 3%.

In addition, government policies that continue to increase excise tax tariff also have an impact on the sustainability and continuity of tobacco industry. This is indicated by the decrease in the number of cigarette manufacturers, where in 2007, the number of cigarette manufacturers reached 4,793 but in 2017, there were only 487 cigarette manufacturers left. In other words, the number of cigarette manufacturers that has survived to date is only around 10%.

Tier simplification policy also has an impact on the absorption of tobacco industry workers. In 2010, the number of workers at tobacco industry was 195.4 thousand people but in 2017, the number of workers was 140.4 thousand people. The most significant decrease in employment was in 2014, which was 18.04%. The decrease in the number of workers was due to the closing of most of the cigarette industry.

The impact of the tier simplification policy and the increase in excise tax rates are not only experienced in terms of production and employment but are also encountered by the Tobacco Product Excise (TPE) revenue. The data shows that the average rate of growth of TPE revenues after the tier simplification has decreased compared to the average annual growth rate before the tier simplification. In 2010-2013, the average growth rate of TPE revenue was 18%. While, in 2014-2017, the average growth of TPE revenue was 9%. This illustration shows that the tier simplification policy not only gives a negative impact on cigarette manufacturers, but also has a decreasing impact on the growth of TPE revenue.

Likewise, for cigarette-producing regions, based on data from the Ministry of Finance (2019), it shows that the growth of PSFTPE (Profit Sharing Find for Tobacco Product Excise) in Indonesia has experienced relatively stagnant growth from year to year. Some regions, especially in tobacco-producing areas such as East Java and Central Java, even experience significant decreases. The declining *trend* in PSFTPE growth is in line with changes in government regulations related to TPE tariff increase and tier simplification. Changes in government regulations have led to a decline in overall TPE; thus, the impact is on the decline in PSFTPE growth in Indonesia.

Another impact of the tier simplification policy and an increase in excise tax tariff turns out to be the trigger of the growth of illegal cigarette circulation. It is estimated that the circulation of illegal cigarettes reaches 4% - 6% of the total cigarette production, which reached 320-340 billion sticks per year in 2014 and continues to increase in 2016 until it reached 12% of the total cigarette consumption in Indonesia (EY, 2018). In general, the price of illegal cigarettes is around 50% cheaper than cigarettes that are subject to excise, cigarette taxes and VAT (value added tax). From 2013 to 2017, the country has lost the potential for TPE revenues of 3.1 trillion Rupiah to 3.8 trillion Rupiah due to the circulation of illegal cigarettes in Indonesia.

Based on the explanation above and the strategic position of the tobacco industry in the national economy, an appropriate policy is required for the sustainability of the tobacco industry. Sustainable management of the tobacco industry is important because improper management can threaten the sustainability of the tobacco industry, especially small and medium scale cigarette manufacturers. Thus, this study aims to analyze the impact of the Minister of Finance Regulation (MFR) No.146/2017 on the Tobacco Products Industry by considering the *affordability* of the people.

## METHODS

### Calculations and Assumptions of Tier Simplification Simulations

This study uses a calculation of the cigarette tier simplification simulation, the scenario which is in corresponding with the MFR No. 146/2017. The regulation states that cigarette excise tax consists of 10 tariff limits that will become the basis for the simplification simulation scenario in this study.

The estimation of the cost of production calculation for each tariff limit in 2017 was obtained from calculating the percentage of cigarette excise tax (percentage of  $C_i$ ) by comparing the nominal of cigarette excise tax rate ( $C_i$ ) with the selling price of cigarettes (RSP or minimum RSP) for each tariff limit ( $i$ ) by using the following formula:

$$\%C = \frac{C_i}{HJ E_i} \quad (1)$$

Where:

$i$  is the tariff limit, showing the difference of the excise tax tariff and the selling price based on the types of cigarette production (MKC/Machine-rolled Kretek Cigarette, MWC/Machine-rolled White Cigarette, HKC/Hand-rolled Kretek Cigarette)

Then, the amount of the value added tax (VAT) is calculated from the price of cigarettes (minimum sales price) multiplied by the value of VAT using the formula of:

$$VAT_i = \%VAT \times \text{minimum RSP}_i \quad (2)$$

Based on Law No. 28 of 2009, regarding local taxes and regional levies, cigarette taxes are subject to 10 percent of the excise tax ( $C_i$ ).

$$T_i = \%T \times C_i \quad (3)$$

Where,

$T_i$  is the cigarette tax value per stick according to tariff limits

Related to company profits, in this road-map simulation, the company profits are assumed at 10 percent. The value of the profit per stick by the types of cigarette ( $\pi_i$ ) is calculated from the value of RSP using the approach of:

$$\pi_i = \% \pi \times \text{minimum RSP} \quad (4)$$

The production costs (TC) of the company are calculated using the approach of minimum RSP value minus excise tariff, VAT, cigarette tax and company *profit (profit margin)*, using the following calculation:

$$\text{Production Cost (TC)} = \text{min RSP}_i - C_i - \text{VAT}_i - T_i - \pi_i \quad (5)$$

By using the excise tariff and minimum RSP from 2017, a simulation of excise tariff and retail sales price is calculated for the tier change from 10 tiers to 5 tiers, while staying within the limits of the regulations set by the law and the Ministry of Finance Regulation (MFR).

$$\text{Min RSP} = \text{TC} + \pi_i + C_i + \text{VAT}_i + T_i \quad (6)$$

After that, the increase in cigarette production ( $Q_t$ ) every year is determined based on the demand for cigarette consumption. Changes in prices ( $\Delta P$ ) affect the number of cigarette requests estimated based on the elasticity of demand for cigarettes ( $\epsilon_i$ ). The amount of each tariff limit in the period is calculated from the production of each tariff limit in  $t_{-1}$  ( $Q_{t-1}$ ) period, as well as the elasticity of demand and changes in selling prices.

$$Q_t = Q_{t-1} \times (1 + (\epsilon_1 \times \Delta P)) \quad (7)$$

Next, price changes ( $\Delta P$ ) in this study are calculated by the formula as follows,

$$\Delta P = \frac{P_{t-1} - P_t}{P_t} \quad (8)$$

In addition to the impact of the increased prices, the impact of increased income on cigarette consumption is also calculated in the simulation, using income elasticity ( $\eta$ ). The impact of increased income on cigarette consumption (income elasticity) is positive. The higher the income, the greater the cigarette consumption. Considering the dynamic economic conditions each year and the possibility of changes in economic conditions, the simulation in this study also considers changes in people's purchasing power. Furthermore, changes in people's purchasing power that are seen through the changes in income ( $I_t$ ) are included in the formulation. Consequently, an increase in income has a positive effect on cigarette production, while a decrease in income has a negative impact on cigarette production.

$$Q_t = Q_{t-1} \times (1 + (\epsilon_i \times \Delta P) + (\eta \times I_t)) \quad (9)$$

Minister of Finance Regulation No. 146/MFR.010/2017 concerning cigarette excise tax tariff states that in 2018 cigarette excise tax still consists of 10 tariff limits. In an effort to estimate the increase in cigarette excise tax and RSP, several assumptions are used including:

- a. Every increase is adjusted in order that the merge among the tariff limits can take place smoothly and can have the same base price. Experience shows that the increase in excise tax rates is not borne by the industry but is passed on by the industry to consumers.
- b. Changes in excise tax in the simulation are adjusted to the merger of excise tax based on MFR No.146/MFR.010/2017 and the increase of the excise tax is subsequently simulated following the highest excise tax prices in the merger of the groups.
- c. The increase in cigarette prices will affect cigarette consumption, which is approached by using the amount of price elasticity to the demand for cigarettes.
- d. Production costs in this study are calculated by reducing cigarette excise tax, 10% local tax, value added tax (VAT) and manufacturing profit from Retail Sales Price (RSP).
- e. The profit of cigarette manufacturers in this simulation is assumed to be 10 percent. This is based on the profits reported by "Philip Morris International" cigarette company

on New York Stock Exchange between 2011 and 2015 ranging from 11.25 percent to 9.3 percent.

- f. The increase in cigarette prices will affect cigarette consumption, which is approached by using the amount of demand elasticity for cigarettes. The demand elasticity for cigarette consumption for HKC III cigarettes type is (-0.8), followed by HKC II (-0.6). Meanwhile, the elasticity for MKC II and MWC II cigarette types is (-0.4), and the elasticity for MKC I, MWC I and HKC I cigarette types is (-0.2) (Demographic Institute of UI, 2016).
- g. The income elasticity of cigarette consumption is positive, with the value of 0.6 (Demographic Institute of UI, 2016). This shows that smoking is included in the category of normal goods, i.e. the higher the income, the greater the cigarette consumption.

## Tier Simplification Scenarios

Based on the calculation above, a simulation will then be performed to determine the magnitude of price changes that occur when there is a change in excise tax. Thus, in this study, there are four simulation scenarios for increasing excise tax tariffs based on MFR No.146/MFR.010/2017 Article 18 regarding the simplification of the structure of excise tax tariffs for tobacco products.

**Table 1: Tier Simplification Scenario**

Segment	Tier	2018	Scenario 1 2019	Scenario 2 2020	Scenario 3 2021
MKC	I	1	1	1	1
	Ila	2	2	2	2
	Ilb	3			
MWC	I	4	3	1	1
	Ila	5	4	2	2
	Ilb	6			
HKC	Ia	7	5	3	3
	Ib	8	6	4	
	II	9	7	5	4
	III	10	8	6	5
<b>TOTAL</b>	<b>Tier</b>	<b>10</b>	<b>8</b>	<b>6</b>	<b>5</b>

Source: Processed data, 2019

In the *first scenario*, in accordance with the first plan of MFR No.146 of 2017 that the excise tax tariffs in 2019 are simplified to 8 *tiers*, MKC II A is combined with MKC II B, and MWC II A is combined with MWC II B. This simplification causes an increase of the excise tax tariffs on MKC II B and MWC II B. The increase of tariffs in the simulation is in accordance with the highest tariff limit of one type of cigarette in the merger of the class.

In the *second scenario*, after the excise tax rate is simplified to 8 *tiers*, the government then plans to simplify the excise tax again in the following year to 6 *tiers*. In simplifying the excise tax tariffs, MKC I is combined with MWC I while MKC and MWC group II are merged into one.

In the *third scenario*, after the groups of cigarettes are reduced into 6 *tiers*, then the government plans to simplify the cigarette groups in the following year to 5 *tiers*. In simplifying the groups, HKC I A is combined with HKC I B.

## RESULTS

### A. Tier Merger Simulations without Considering the Purchasing Power

This simulation does not involve the calculation of income elasticity because it is assumed that there is no change in the purchasing power of the people when the government implements the tier simplification policy. In general, the results show that there is a decrease in production in each scenario if the cigarette groups are simplified by the government without a change in people's purchasing power.

### Impact of Tier simplification to Production

The estimation of cigarette production after the simplification of customs tariffs from 10 *tiers* to 8 *tiers* without considering the purchasing power causes a decline in cigarette production at MKC II B and MWC II B. The merger of MKC II A with MKC II B cigarettes results in an increase in excise tax rates and Minimum RSP on MKC II B cigarettes. Likewise, the combination of MWC II A with MWC II B cigarettes causes an increase in excise tax rates and Minimum RSP on MWC II B cigarettes. The simulation results shows that the impact of simplification of the class to 8 *tiers* causes a decrease in MKC II B production by (-10 %), and decreased production on SPM II B cigarettes by (-19 %). The decline in production are so great because MKC II and MWC II cigarettes have higher elasticity than MKC, MWC, HKC I cigarettes. In addition, the change in production is quite large after the change of classification from 10 *tiers* to 8 *tiers* since the increase in RSP on MKC II B and MWC II B cigarettes is quite large. The increase occurred because there are adjustments to the excise tax tariffs and Minimum RSP to the highest class. The percentage increase in minimum RSP from MKC II B is 25%, while the percentage increase in MWC II B is 46%. Furthermore, the percentage increase in excise tax tariff from MKC and MWC II B is 4%.

The estimation of cigarette production after simplifying the excise tax from 8 *tiers* to 6 *tiers* without considering the people's purchasing power causes a decrease in cigarette production for MKC I and MKC II. The combination of MKC I and MKC II cigarettes causes both types of cigarettes to increase the excise tax tariff and Minimum RSP following MWC I and MWC II. The simulation results shows that the impact of tier simplification into 6 *tiers* causes a decrease in production for MKC I by (-0.2 %), and a decrease in production for MKC II cigarette type by (-2 %). The decrease in production of the two types of cigarettes is smaller than the simplification of groups in the previous year. The reason is that the Minimum RSP of MKC I and MWC I does not have a big difference. MKC I only experiences a 1% increase in RSP to adjust to MWC I price. In addition, the elasticity of MKC I cigarettes is only (-0.2) so that the price change does not result in a significant impact on the change in the production of MKC I cigarettes. It occurs the same with the merging of MKC II and MWC II cigarette types, both of which have been simplified in the previous year; thus, the merger of the two does not experience a large price adjustment. The Minimum RSP for MKC II cigarette increases by 4% to adjust the price of MWC II. Hence, the change of Minimum RSP is much smaller than the simplification of group II in the previous year.

The estimation of cigarette production after simplifying the excise tax from 6 *tiers* to 5 *tiers* without considering people's purchasing power leads to a decrease in cigarette production in HKC I B cigarettes. The merger of HKC I A with HKC I B cigarettes causes HKC I cigarettes to experience an increase in excise tax rates and Minimum RSP following HKC I A. The simulation results shows that the impact of the *tier simplification* to 5 *tiers* causes a decrease in production in HKC I B by (-8%). The occurring decrease of production is quite large because HKC I B cigarette type experiences an increase in the excise tax rate by 26% and an increase in the Minimum RSP by 42% from the previous tariff. This result occurs because HKC I B adjusts the excise tax rate and the Minimum RSP following the HKC I A.

**Table 2: Simulation Results of Tobacco Industry Tier Merger without Considering the Purchasing Power**

2018 (10 TIER)	2019 (8 TIER)	2020 (6 TIER)	2021 (5 TIER)
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SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A	SKM I -0,2%	SPM I	SKT I A	SKM I	SPM I	SKT I A
SKM II A	SPM II A	SKT I B	SKM II A	SPM II A	SKT I B	SKM II -2%	SPM II	SKT I B	SKM II	SPM II	SKT I B -8%
SKM II B	SPM II B	SKT II	SKM II B -10%	SPM II B -19%	SKT II			SKT II			SKT II
-	-	SKT III	-	-	SKT III	-	-	SKT III	-	-	SKT III
<b>TPE revenue</b>	154.005	-	<b>TPE revenue</b>	153.053	-0,6%	<b>TPE revenue</b>	157.560	2,9%	<b>TPE revenue</b>	158.317	0,48%

Source: Processed data, 2019

### Impact of Tier Simplification on the Revenue of Tobacco Product Excise (TPE)

Excise tax is one of the government instruments to control cigarette consumption. Through the determination of cigarette excise tax, the government can also generate state revenue. The table 2. describes the impact of changes in tariffs on state revenue based on the tier simplification scenario according to MFR No. 146/2017. In the tier simplification scenario from 10 *tiers* to 8 *tiers*, TPE revenue decreases by (-0.6%) from Rp.154,005 trillion to Rp.153,053 trillion. The decline in TPE revenue occurs since the decrease in cigarette production is greater than the increase in TPE revenue.

Next, in the tier simplification scenario of 6 *tiers*, TPE revenues increases by 2.9% from Rp.153,053 trillion to Rp.157,560 trillion. The increase in TPE revenue occurs due to the change in the increased excise tax because the simplification of the excise tax structure into 6 tiers is greater than the decrease in cigarette production.

In the tier simplification scenario of 5 *tiers*, TPE revenue increases by (0.48%) from Rp.157,560 trillion to Rp.158,317 trillion. This increase in TPE revenue is smaller than the previous one because in this scenario, there is only one simplification of the group followed by a substantial decrease in HKC I production. Therefore, the increase in TPE revenue in this simplification scenario is low.

### B. Simulation of Tier Merger by Considering the Increase of Purchasing Power

This simulation involves the calculation of income elasticity. It is because this simulation assumed that there is a change in the increase of people's purchasing power when the government implemented the tier simplification policy. In general, the results shows that the production decline only occurs in the tier simplification scenario of 8 tiers and 5 tiers if only the cigarette group is simplified by the government when the people's purchasing power increases by 3%.

#### Impact of Tier Simplification on Production

The estimation of cigarette production after simplifying the excise tax from 10 *tiers* to 8 *tiers* by considering an increase in people's purchasing power causes a decrease in cigarette production for MKC II B and MWC II B. The simulation results shows that the impact of simplification of the group to 8 *tiers* causes a decrease in production for MKC II B by (-8 %), and decreased production on SPM II B cigarettes by (-17 %). The magnitude of the decline in production occurs because MKC II and MWC II cigarettes have a higher elasticity value than MKC, MWC, HKC I cigarettes. In addition, the change in production is quite large after the classification from 10 *tiers* to 8 *tiers* because the increase in RSP on MKC II B and MWC II B



is quite large. The increase occurs because there are adjustments to the excise tax tariff and RSP for the highest class.

The estimation of cigarette production after simplifying the excise tax from 8 *tiers* to 6 *tiers* by considering an increase in people's purchasing power does not cause a decrease in cigarette production for MKC I and MKC II. This happens because the Minimum RSP of MKC I and MWC I does not have a large difference and can be compensated by the increase in people's purchasing power. In addition, the elasticity of MKC I cigarette type is only (-0.2) so that price change does not have a significant impact on the change in the production of MKC I cigarette type. It occurs the same with the merger of MKC II and MWC II cigarette types. Both were simplified in the previous year, so that the current merger of the two does not experience a large price adjustment and can be compensated by the increase in people's purchasing power.

The estimation of cigarette production after simplifying the excise tax from 6 *tiers* to 5 *tiers* without considering an increase in people's purchasing power leads to a decrease in cigarette production for HKC I B. Combining HKC I A and HKC I B cigarette types causes HKC I B cigarette to increase the excise tax tariff and Minimum RSP following HKC I A. The simulation results shows that the impact of tier simplification to 5 *tiers* causes a decrease in production on HKC I B by (-7%). The production decline occurs because HKC I B experiences an increase in excise tax tariff by 26% and an increase in Minimum RSP by 42% from the previous tariff. The rate increase takes place because HKC I B adjusts the excise tax tariff and Minimum RSP of HKC I A.

### Impact of Tier Simplification on the Revenue of Tobacco Product Excise (TPE)

The table below describes the impact of changes in tariffs on state revenue based on the tier simplification scenario according to MFR No. 146/2017. In the tier simplification scenario from 10 *tiers* to 8 *tiers* by considering the increase in people's purchasing power by 3%, TPE revenue increases by (1.2 %) from Rp.154,005 trillion to Rp.155,843 trillion. The increase of TPE revenue is attributable to the reduced amount of cigarette production, which is smaller than the increase of TPE revenue. An increase in people's purchasing power is able to compensate for the increase in excise tax tariff and the price of cigarettes due to the tier simplification policy.

Then, in the tier simplification scenario of 6 *tiers*, TPE revenue increases by 6.1% from Rp.155,843 trillion to Rp.163,325 trillion. The large increase in TPE revenue due to the tier simplification in this scenario does not have a negative impact on cigarette production despite an increase in excise tax tariff and Minimum RSP. An increase in people's purchasing power is able to offset the increase in cigarette prices due to the tier simplification. Therefore, in this scenario, the government receives a large increase in TPE revenues.

In the tier simplification scenario of 5 *tiers*, TPE revenue increases by 8.5% from Rp.163,325 trillion to Rp.167,074 trillion. This increase in TPE revenue is greater than the previous one because in this scenario, there is a fairly high increase in excise tax tariff and Minimum RSP, which is also offset by the increase in people's purchasing power so that it can have an impact on increasing TPE revenue. In addition to the increase in people's purchasing power, HKC I cigarettes also possesses a low elasticity of (-0.2). Therefore, the impact on decreasing cigarette production is less than the increase in TPE revenue.

**Table 3: Simulation Results of Tobacco Industry Tier Merger by Considering the Increase in Purchasing Power (3 %)**

2018 (10 TIER)			2019 (8 TIER)			2020 (6 TIER)			2021 (5 TIER)		
SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A



SKM II A	SPM II A	SKT I B	SKM II A	SPM II A	SKT I B	SKM II	SPM II	SKT I B	SKM II	SPM II	SKT I B	-7%
SKM II B	SPM II B	SKT II	SKM II B	SPM II B	SKT II			SKT II				
-	-	SKT III	-	-	SKT III	-	-	SKT III	-	-	SKT III	
<b>TPE revenue</b>	154.005	-	<b>TPE revenue</b>	155.834	1,2%	<b>TPE revenue</b>	163.325	6,1%	<b>TPE revenue</b>	167.074	8,5%	

Source: Processed data, 2019

### C. Simulation of Tobacco Industry Tier Merger Considering the Decrease in Purchasing Power (-3%)

This simulation involves the calculation of income elasticity because in this simulation it is assumed that there is a change in the decline of people's purchasing power when the government implements the tier simplification policy. In general, the results shows that a decrease in the production will occurs in the whole tier simplification scenarios if the cigarette tier simplification by the government is implemented when people's purchasing power decreases by 3%.

#### Impact of Tier Simplification on Production

The estimation of cigarette production after simplifying the excise tax from 10 *tiers* to 8 *tiers* by considering the decrease in purchasing power causes a decrease in cigarette production for MKC II B and MWC II B. The simulation results shows that the impact of tier simplification to 8 *tiers* results in a decrease in production for MKC II B by (-12 %), and decreased production on MWC II B cigarettes by (-20 %). The decline in production is greater than the previous simulation due to the decrease in people's purchasing power, so people are incapable of compensating for the increase in cigarette prices.

The estimation of cigarette production after simplifying the class to 6 *tiers* by considering the decrease in purchasing power causes a decrease in cigarette production for MKC I by (-1.9%) and MKC II by (-3.5%). Although MKC I and MWC I does not have a big difference, this production decrease is greater than the previous simulation due to the decrease in people's purchasing power that cannot compensate for the increase in excise tax tariff and cigarette price. In harmony with the merger of MKC II with MWC II cigarette types, although both have experienced simplification in the previous year, the current merger of the two cannot be compensated because of the decline in people's purchasing power.

**Table 4: Simulation Results of Tobacco Industry Tier Merger by Considering the Decrease in the Purchasing Power (-3%)**

2018 (10 TIER)			2019 (8 TIER)			2020 (6 TIER)			2021 (5 TIER)			
SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A	SKM I	SPM I	SKT I A	
						-1,9%						
SKM II A	SPM II A	SKT I B	SKM II A	SPM II A	SKT I B	SKM II	SPM II	SKT I B	SKM II	SPM II	SKT I B	-10%
SKM II B	SPM II B	SKT II	SKM II B	SPM II B	SKT II			SKT II			SKT II	
			-12%	-20%								

-	-	SKT III	-	-	SKT III	-	-	SKT III	-	-	SKT III
<b>TPE revenue</b>	154.005	-	<b>TPE revenue</b>	150.271	-2,4%	<b>TPE revenue</b>	151.898	1,1%	<b>TPE revenue</b>	149.872	-1,3%

Source: Processed data, 2019

The estimation of cigarette production after simplifying the class to 5 *tiers* by considering the decrease in people's purchasing power leads to a decrease in cigarette production for HKC I B by -10%. The decrease of production in this simulation is also greater because the increase in excise tax tariff and cigarette price cannot be compensated in response to the decrease in people's purchasing power.

### Impact of Tier Simplification on the Revenue of Tobacco Product Excise (TPE)

The table 4. portrays the impact of changes in tariffs on state revenue based on the tier simplification scenario according to MFR No. 146/2017. In the tier simplification scenario from 10 *tiers* to 8 *tiers* by considering the decrease in people's purchasing power by (-3%), TPE revenue decreases by (-2.4 %) from Rp.154,005 trillion to Rp.150,271 trillion. The decline in TPE revenue is due to the decrease in cigarette production that is greater than the increase in TPE revenue. The decline in purchasing power is unable to compensate for the increase in excise tax tariff and the cigarettes price due to the tier simplification policy.

Then, in the tier simplification scenario of 6 *tiers*, TPE revenues increases by (1.1 %) from Rp.150,271 trillion to Rp.151,898 trillion. The increase in TPE revenue also occurs due to the amount of production decline in MKC I and MKC II, which is greater than the decline in the amount of production.

In the tier simplification scenario of 5 *tiers*, TPE revenue decreases by (-1.3 %) from Rp.151,898 trillion to Rp.149,872 trillion. The decline in TPE revenue also occurs due to the amount of production decline in HKC I, which is greater than the increase in TPE revenue. The decline in purchasing power in this scenario is not able to compensate for the increase in excise tax tariff and the cigarettes price due to the tier simplification policy.

## DISCUSSION

In this study, there are three scenarios available in this simulation in accordance with MFR No.146 of 2017. The first scenario is the simplification of cigarette groups to 8 tiers, the second scenario is the simplification of cigarette groups to 6 tiers, and the third scenario is the simplification of groups to 5 tiers. Each of these scenarios is simulated within three different economic condition which are when people's purchasing power remains the same, people's purchasing power increases, and people's purchasing power decreases.

In general, the simulation results shows that the cigarette tier simplification policy which is carried out *continuously* from year to year had an impact on decreasing the volume of cigarette production in almost all scenarios in every economic condition. In scenario 1 (2019), when the government combines type II A and II B cigarettes, it will have a major impact on reducing the production of class II B cigarettes in all economic conditions. It means that changes in people's purchasing power (up or down) continue to have a large impact on the decline in production for class II B cigarettes when there is a tier simplification within it.

Meanwhile, in scenario 2 (2020), when the government combines MKC and MWC cigarettes (MKC I and MWC I; MKC II and MWC II), the decrease in production only occurs on MKC I and MKC II cigarette types when people's purchasing power remains the same and when there is a decrease of purchasing power. This happens because the Minimum RSP of Group I does not have a large difference and can be compensated by the increase in people's purchasing power. In addition, the elasticity of class I cigarettes is only (-0.2) so that changes in price do not have a significant impact on changes in the production of MKC I cigarette type. The same thing happens for the merger of type II cigarettes since both have experienced

simplification in the previous year; hence, the current merger of the two does not experience a large price adjustment and can be compensated by the increase in people's purchasing power.

Then in scenario 3 (year 2021), when the government merges HKC I A cigarettes and HKC I B cigarettes, there is a decline in the production of HKC I B cigarette in all economic conditions. This occurs because HKC I B experiences an increase in the excise tax tariff by 26% and an increase in Minimum RSP by 42% from the previous tariff to adjust the price with HKC I A. Consequently, although the elasticity of the HKC cigarette was low, a large price change caused a decrease in production at HKC IB in all economic conditions.

Based on the results of tier simplification simulation carried out with various scenarios and various economic conditions, in general, tier simplifications can have a positive impact on economic growth when economic conditions experience a decline in purchasing power. In scenario 1 (2019), when the government combines type II A cigarettes with group II B, it will have a big impact on the decline in TPE revenues when people's purchasing power remains constant and when people's purchasing power decreases. It means that tier simplification policy can result in a loss for the TPE revenues if the policy is issued when people's purchasing power is fixed or decreased. Meanwhile, in scenario 2 (2020), when the government combines MKC and MWC cigarettes (MKC I and MWC I; MKC II and MWC II), TPE revenues tend to increase in all economic conditions because the decline in production that occurs in this simplification scenario has no decreasing impact in large production volumes. Then, in scenario 3 (2021), when the government combines HKC I A and HKC I B cigarette types, TPE revenues will decrease if the policy is implemented when there is a decline in people's purchasing power.

Thus, per capita economic condition of a country as reflected through the people's purchasing power becomes a determining factor for the effectiveness of increased excise tariff policy due to the increase of tobacco product excise. The simulation results above showed that the tier simplification causes the price of cigarettes to increase, but does not always have a positive impact on the increase in TPE revenues. On the other hand, the increase in cigarette prices due to the simplification of these groups continues to reduce the production of small and medium-sized cigarettes, so the cigarette industry is getting worse.

Considering that cigarettes are items that contain *addictive* substances, the increase in cigarette prices will not directly result in decreased cigarette consumption. The effectiveness of increasing cigarette prices to control tobacco use depends on the level of individual income (Schafferer, et al., 2018). Cigarette consumers will tend to switch to cheaper cigarette products. In fact, smokers with lower incomes tend to buy smuggled cigarettes to compensate for price fluctuations than other smokers (Schafferer, et al., 2018).

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