

EXCISE DUTY EXTENSION IN INDONESIA: FIREWORKS

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ABSTRACT:

Indonesia is referred to as narrowly extreme coverage or a country that has very few excise objects. Until now, excise objects in Indonesia only cover 4 types, namely tobacco products (HT), ethyl alcohol (EA), beverages containing ethyl alcohol (MMEA), and what has recently been designated as excise objects, namely plastic. These four types of excise objects, or what are commonly referred to as Excisable Goods (BKC), are relatively few when compared to other countries. Finland, Japan, India and Thailand even stipulate more than ten Excisable Goods as a source of state revenue. Indonesia is deemed it necessary to extend excise duty. One of the goods that has the potential to be subject to excise because of its characteristics is fireworks. This study aims to understand more why fireworks should be included in BKC and to calculate the amount of state revenue that can be obtained by issuing the policy about fireworks as BKC. The method used in this study was qualitative methods with a content analysis approach and systematic literature observation. The result showed that based on data obtained from various sources, fireworks cause negative impacts such as air pollution, sound pollution, water pollution, injuries and even death. Based on this negative impact, fireworks are very likely to be subject to excise. Excise rates that may be imposed for fireworks are a specific rate of IDR 809.64 per kilogram of fireworks or an ad valorem rate of 5% to 80% of the sale value of the fireworks. Potential state revenue generated from the imposition of excise duty on fireworks is a minimum of IDR 78 billion for specific excise rates or IDR 93.83 billion to IDR 1.50 trillion for ad valorem excise rates.

Keywords: Ad Valorem, Excise, Fireworks, Specific, Tariff

1. INTRODUCTION

Narrowly Extreme Coverage

Sources of state revenue in Indonesia are often dominated by tax revenues. In the last five years, sources of revenue from taxation have always been above 70% of total state revenues. This figure shows that taxation has a big contribution in supporting the source of state revenue. In order to maximize this contribution, the government can explore potential revenue from the taxation sector. Exploring this potential can be done by looking for new sources of income that can be used as tax objects, by looking at its application in other countries and calculating the potential revenue that can be generated.

One of the potential for state revenue that still has room for improvement is excise. Until now, excise objects in Indonesia only cover 4 types, namely tobacco products (HT), ethyl alcohol (EA), beverages containing ethyl alcohol (MMEA), and what has recently been designated as excise objects, plastic. These four types of excise objects, or what are commonly referred to as Excisable Goods (BKC), are relatively few when compared to other countries. Finland, Japan, India and Thailand have even designated more than 10 BKC as their country's source of revenue. Countries that determine too few excise objects are known as narrowly extreme coverage, including Indonesia. The few objects that are subject to excise limit the sources of revenue that should be explored more deeply to meet the country's needs and assist ongoing development.

Excise Duty Extension

In accordance with the characteristics of BKC, there are several goods that can become new BKC objects but regulations have not been implemented. One of the goods that can be subject to excise duty is goods intended for human enjoyment. The form of enjoyment that humans seek can be in the form of entertainment. Entertainment is a form of goods that can be subject to excise duty, partly because its distribution needs to be monitored or it can have a negative impact on the human being himself, other human beings, and the environment.

In this world, humans certainly need to find entertainment either in the context of carrying out a culture or to entertain oneself. One form of entertainment that is often performed is a form of celebration of holidays or certain moments such as Independence Day, New Years, cultural festivals, and others. This is a form of human instinct to seek pleasure in the form of entertainment in accordance with the pleasure theory. To complete this form of celebration, one component that is often used is sparks, or better known as fireworks.

The history of the development of fireworks is closely related to the discovery of gunpowder. According to the Smithsonian Science Education Center (2015), a scientist from

China tried to mix sulfur, charcoal, and potassium nitrate in an attempt to make an "immortal" medicine in 800 AD. The mixture was then exposed to fire and gunpowder was finally discovered for the first time. The powder was put on a small bamboo stick and the first fireworks were born. At the beginning of its invention, the fireworks were used for entertainment at weddings by throwing bamboo sticks into the fire to create a pop of sound.

Between 1200 – 1600, the distribution and use of gunpowder was focused on making weapons. China itself used gunpowder to make war cannons. This cannon was the first form of aerial fireworks, namely by launching material into the air at the enemy. Western countries also use this gunpowder to make rifles and cannons that are more sophisticated. In the 1800s, modern fireworks were born, namely with the use of color and use as a form of festive celebration. The development of gunpowder helped spread the concept of fireworks around the world.

This distribution can be seen from the growth of the fireworks market which is increasing from year to year. According to Globenewswire, the world's fireworks market was valued at \$2.483 billion in 2020. The market growth has soared high that by 2027, the world's fireworks market is projected to reach \$3.244 billion. This value is certainly not a small value and is not something that can be ignored. Government authorities, especially in the field of revenue, must be able to see that this information is potential revenue for the state.

Behind the fantastic reception potential, there are many impacts caused by the use of fireworks. Singh et al. (2019), stated that air pollution in the excessive use of fireworks, exemplified at a fireworks festival, experienced a significant increase of up to two to four times the normal threshold for air pollution. In addition to this, airborne visibility decreases by up to 92% following the use of fireworks in a celebration. Health issues are also a big problem. Based on data from the Health Effects Institute in Singh et al. (2019), in 2017 there were three million deaths due to exposure to airborne pollutants.

Fireworks can also pose an immediate hazard. Many cases of accidents due to fireworks have occurred in Indonesia. Reporting from metrotvnews.com (2023), Deputy Regent Kaur, Bengkulu suffered an injury to his hand when setting off fireworks to celebrate the 2023 New Year. The fireworks he was holding suddenly exploded for no apparent reason. In addition, factories that produce fireworks are very prone to fires because of the gunpowder used. Reporting from CNN Indonesia, in 2017 there was an explosion at the PT Panca Buana Cahaya Sukses fireworks factory. The explosion then started a fire that destroyed the factory. This incident caused the death of 49 people and also injured 44 people who were treated in

hospital. This incident certainly caused losses, both in terms of victims and material from the damage to buildings around the incident.

These events and hazards cause fireworks to be monitored both from their production and their use. In Indonesia, supervision of the production and use of fireworks is regulated in the Regulation of the Head of the Indonesian National Police Number 17 of 2017 concerning Licensing, Security, Supervision and Control of Commercial Explosives. The regulations still limit the definition of prohibited explosives to firecrackers, not fireworks. Different specifications such as the content of gunpowder in a product determine the treatment of its circulation. Even so, fireworks that are not prohibited can still cause negative impacts and potential hazards that can threaten the community. For this reason, another supervisory method is needed.

The supervisory method that can be used is the imposition of excise on fireworks. Excise is a method that has a limiting function to control potential negative externalities that are generated as well as a source of state revenue. Based on Pigou (1920) in Hidayat & Surjono (2016), the negative effects arising from a commodity can be overcome by implementing taxes on the commodity. This is an authority that only the government has. The aim of implementing this policy is to protect the public from the negative effects that arise. For this reason, it is necessary to expand the application of excise tax on fireworks.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Excise Duty Definition

Determination of new excise objects must of course be in accordance with and in line with the applicable laws and regulations. Judging from Article 1 paragraph 1 of Law Number 11 of 1995 concerning Excise as amended by Law Number 39 of 2007 concerning Amendments to Law Number 11 of 1995 concerning Excise (Excise Law), excise is defined as "state levies which are imposed on certain goods which have the properties or characteristics specified in this law." From this understanding, the addition of excise objects must meet the requirements in the form of "goods" and also have certain properties or characteristics.

Excise Duty Characteristics

The characteristics of goods subject to excise are regulated in Article 2 of the Excise Law which include:

- a. its consumption needs to be controlled;
- b. circulation needs to be monitored;

- c. its use may have a negative impact on society or the environment; or
- d. its use requires the imposition of state levies for the sake of justice and balance.

Goods that meet these characteristics and are subject to excise duty are referred to as Excisable Goods (BKC). BKC expansion of certain goods can be carried out as long as the goods to be designated as BKC have at least one of these characteristics. The government can determine a new BKC by considering the urgency of imposing excise duty on certain goods and the potential revenue that can be generated.

Excise Duty Payment Procedures

In addition to considering the object to be designated as BKC, the government also needs to determine the procedure for repayment of the BKC. In the Excise Law itself, the payment of excise can be done in 3 ways, namely payment, affixing excise bands, or affixing other excise settlement signs. The method of payment for the new BKC is determined by adjusting the characteristics and nature of the goods themselves. Determining the procedure for repayment is important because it can affect the effectiveness and efficiency of the collection of the new BKC.

Public Interest Theory

Public interest theory explains that the government as a policy maker should work in the public interest. Marhfor et al. (2020) said that regulators prioritize the public interest by making decisions and paying attention to important issues. Supporters of this theory often relate regulations that are made using externalities as reasons, such as pollution, so that actors are encouraged to take strategies in accordance with the public interest (Wedari, 2023).

One practice of this theory is government policy regarding the imposition of excise on certain goods that produce negative externalities. Pigou (1920, quoted in Hidayat & Surjono, 2016) argued that negative externalities caused by certain commodities need to be overcome by imposing taxes on these commodities.

3. RESEARCH METHODS

This research was conducted using qualitative methods with a content analysis approach and systematic literature observation. Content analysis is a qualitative research technique that emphasizes in-depth discussion of the content of information, reading symbols, and the meaning of interactions that occur (Bungin, 2017 quoted in Pratama et al., 2022). A systematic literature review is a way to identify, inspire, and interpret all relevant research by formulating the problem or topic area under study (Calderon & Ruiz, 2015). The research began by looking for reflections on literature that discussed the use of fireworks and their

negative impacts, the implementation of excise tax on fireworks in various countries such as China, Myanmar, Laos, and states in the United States by using Google Scholar or the official website of the respective country's government, and an analysis of the content of each piece of literature was carried out.

Research using analytical methods aims to identify and present information related to the extensification of taxation, especially fireworks excise and its potential for state revenue. Furthermore, research using the systematic library observation method aims to find strategies that will help overcome the problems faced and identify various points of view related to the problems studied from data obtained from various literature, both local and international, which can be in the form of articles in international and local journals, dissertation, and working papers that review fireworks excise and its application in several countries. This review is used as a basis for calculating potential fireworks excise revenues.

4. ANALYSIS AND DISCUSSION

Data and Fact

Domestic Fireworks Production

Indonesia has the potential to become one of the largest fireworks producing countries. Indonesia is able to compete in the world fireworks market and proves that fireworks production in Indonesia is growing. This can be seen from the production of fireworks in Indonesia which always grows from year to year (Central Bureau of Statistics and WorldTopExports.com, 2017 to 2022). In obtaining the amount of domestic production of fireworks, the authors take into account the total amount of domestic demand and also the total export of fireworks. The data used is obtained from calculations using the assumption that fireworks imports are not the only source of meeting the needs of fireworks in Indonesia. The following is a calculation of total domestic needs and production using Central Bureau of Statistics data and information from the worldtopexports.com website which is shown in Table 1 below.

Table 1
Calculation of the Production Value of Fireworks in Indonesia

Code	Description	Needs Percentage (%)	Total (kg)	Value (\$US)	Value(Rp)*	Value per Unit (\$US/kg)
A	Total Fireworks Import from 2017 to 2022	86,80%	83.660.500	108.597.885	1.628.968.275.000	1,30
B	Total Domestic Fireworks Needs	100%	96.383.065	125.112.771	1.876.691.561.060	1,30
C	Total Needs nor fulfilled by Import (A - B)		12.722.565	16.514.886	247.723.286.060	1,30
D	Total Fierworks Export from 2017 to 2022		42.183	138.475	2.077.125.000	3,28
E	Total Domestic Production (C + D)		12.764.748	41.903.099	628.546.480.441	3,28

*\$US 1 = Rp 15.000

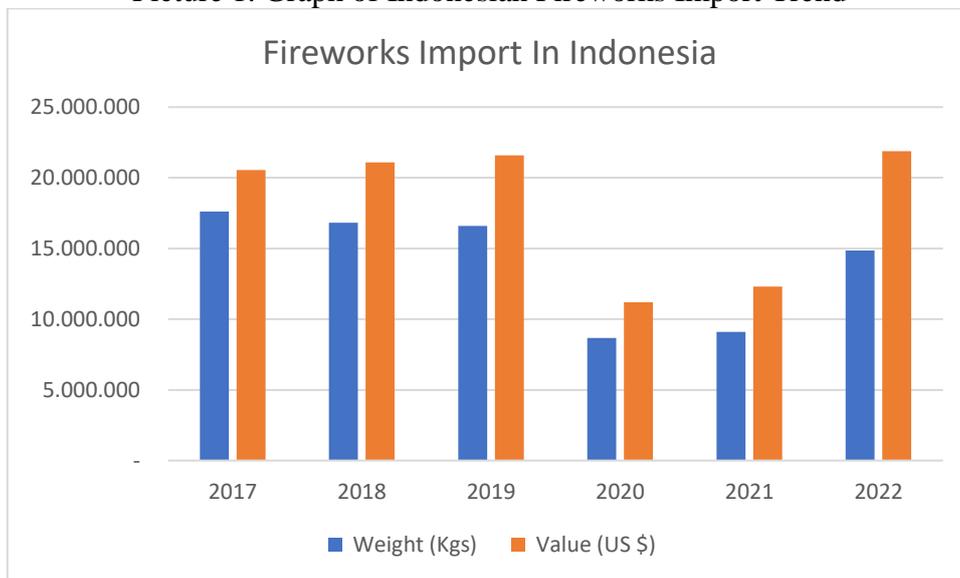
Source: Central Bureau of Statistics and worldtopexports.com (Processed by the Author)

The data above is processed by only taking into account the import value of fireworks from China and ignoring import values from other countries because based on data obtained by World Top Exports, China is the largest supplying country for fireworks in the world, amounting to 86.8% of the country's fireworks needs in the world is filled by China, including Indonesia. The assumption used by the author is that Indonesia's need for fireworks is at 100% level and as much as 86.8% has been met from imports so that the difference is domestic production. The author also calculates the export value of Indonesian fireworks to get the net value of fireworks actually consumed in Indonesia. From the calculation above, it was found that Indonesia's total domestic production from 2017-2022 is 12,764 tonnes with a production value of IDR 628.6 billion.

Number of Imports and Exports

Apart from producing fireworks domestically, Indonesia also imports fireworks. According to the Central Bureau of Statistics, during the period 2017-2022, Indonesia has imported fireworks (HS code 36041000) of 83,664 tons with a value of \$108,629,308. Imported fireworks are dominated by China. The trend of fireworks imports can be seen in Graph 1.

Picture 1. Graph of Indonesian Fireworks Import Trend



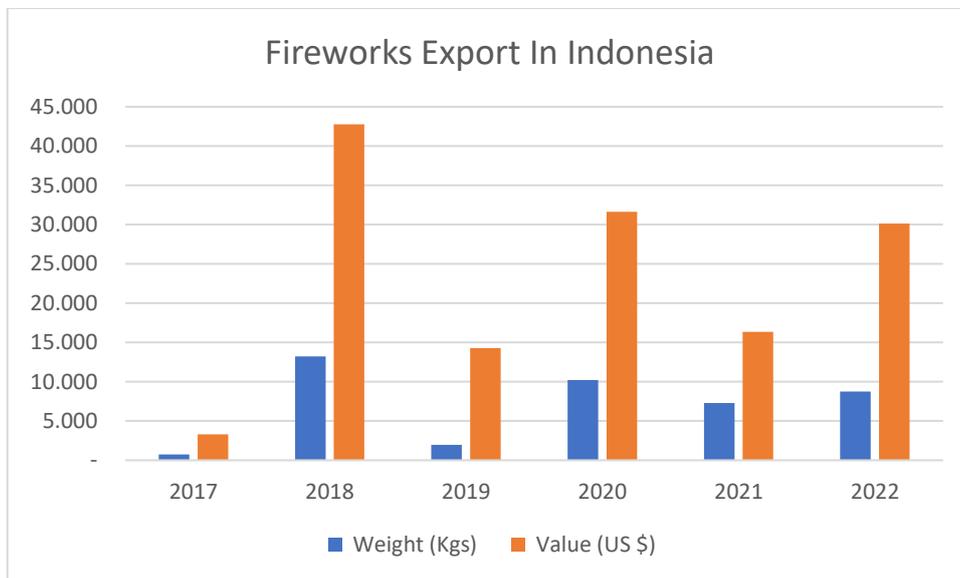
Source: Central Bureau of Statistics (Processed by the author)

It can be seen in the graph of Indonesian fireworks imports, the trend shows that fireworks import activities tend to increase. The decline in 2020 was quite significant due to the impact of the policy of limiting the entry of goods from abroad due to COVID-19. In 2022 the trend of imported fireworks will start to return to normal as before COVID-19.

Apart from importing, Indonesia also exports fireworks to East Timor, Japan and Papua New Guinea. 42 tons of fireworks were exported with a value of \$138,476. This shows

that the value of imports is far greater than the value of exports, which means that more fireworks are consumed domestically. Reporting from the Observatory of Economic Complexity (OEC), based on the value of exports and imports in dollars, Indonesia in 2021 ranked 32 out of 75 countries in the world that export fireworks. The country that ranks 1st in terms of fireworks exports is China. China's fireworks export value reaches \$921 million and is claimed to be a supplier country for nearly 90% of the world's fireworks needs. As for imports, Indonesia ranks 9th out of 163 countries in the world that import fireworks. Ranked 1st in the largest fireworks importing country is the United States with an import value of \$578 million. Trend of fireworks exports from 2017 to 2022 can be seen in Graph 2.

Picture 2. Graph of Indonesian Fireworks Export Trend



Source: Central Bureau of Statistics (Processed by the author).

It should be noted that in order to carry out export-import activities of fireworks and/or activities related to fireworks, importers or exporters must first obtain permission from the Police of the Republic of Indonesia. This is regulated in the Chief of Police Regulation Number 17 of 2017 concerning Licensing, Security, Supervision and Control of Commercial Explosives.

Number of Injuries

Most firework injuries and/or deaths result from improper use. However, even correct use can injure and even kill people. Fireworks can misfire, go off in the wrong direction, or explode all at once.

According to Bitter (2021) who conducted a study of fireworks injuries in the United States, there were 7,699 injuries in 2017 (2.37 per 100,000 population) compared to 5,727 (1.88 per 100,000 population) in 2008. The majority of victims were male (74.6%). The US

Consumer Product Safety Commission (CPSC) found a 50 percent increase in deaths and injuries from fireworks-related incidents in 2020, compared to 2019. About 15,600 people were treated in hospital emergency departments for fireworks injuries in 2020, an increase from 10,000 injuries in 2019. The latest CPSC report also shows that there were about 10,200 fireworks-related injuries in 2022. In more detail, the report also includes the number of people injured from year to year. The number of fireworks injuries from 2017 to 2022 is outlined in Table 2 below.

Table 2
Number of People Injured by Fireworks

Year	Total Injuries	Injuries per 100.000 population
2017	12.900	4,0
2018	9.100	2,8
2019	10.000	3,0
2020	15.600	4,7
2021	11.500	3,5
2022	10.200	3,1

Source: CPSC Annual Report (Prepared by the Author).

The report also includes information about the CPSC's oversight of fireworks sold in the US. In 2022, about 43 percent of the fireworks selected and tested were found to contain illegal components that could cause severe injury. These components include fuses that do not comply with the law, the presence of banned chemicals, and excessive pyrotechnic materials.

Indonesia does not yet have fireworks explosion injury incidence data recorded annually. According to the official website of the Government General Hospital (RSUP) Dr. Sardjito as the highest center and referral in Indonesia and Yogyakarta in particular, from January to June 2019 there were 23 cases related to fireworks explosions at RSUP Dr. Sardjito. This shows an increase compared to the 2017 data where there were 6 cases and in 2018 showed 15 cases. All cases recorded occurred during the fasting month until the week of Eid al-Fitr celebration. Of the 23 cases, there were 5 cases of hand injuries that forced amputation of the fingers caused by very serious injuries so that patients had to be willing to lose their fingers. In the other 7 cases, hand reconstruction surgery was performed to save the patient's fingers with ongoing care.

According to the National Health Insurance (JKN) regulation, cases related to hobbies, in this case fireworks, are not covered by the nursing cost. In addition to the costs incurred during the treatment of patients with fireworks explosion injuries, the costs incurred in the long term are also significant as most of the patients are children and many cases result in injuries to the limbs, especially the upper limbs, causing permanent disability.

Total Material Loss

The negative impact of using fireworks is not limited to health. It costs money to treat and care for injuries caused by fireworks. The costs incurred become material losses that must be borne by the injured person. Nizamoglu et al. (2018) found that the most common body part injured by fireworks is the hand. Similar results were also found in the research of Maassel et al. (2021) which suggested that fingers and hands were the most common body parts injured by fireworks. This data is reinforced by the research of Winicki et al. (2023) which shows that the upper limbs are most often affected by sparks or explosions of fireworks. Winicki et al. (2023) further found that the most common diagnoses of the 3,219 injuries in their study were burns (47.2%), contusions/scrapes (21.3), and fractures/sprains (8.5%), respectively.

From the results of these studies, the author calculates the estimated material losses that must be borne in relation to hand injuries caused by fireworks. The calculation of material losses will refer to the tariff standards set out in the Minister of Health Regulation Number 6 of 2018 concerning the Third Amendment to the Minister of Health Regulation Number 52 of 2016 concerning Health Service Tariff Standards in the Implementation of the Health Insurance Program. The tariff that the author will use is the tariff applicable to Type C Regional 1 Government Hospitals. The author chooses to use the Type C Hospital tariff because based on data on the Ministry of Health's Hospital Information System (SIRS) page, it is known that Type C Hospitals have the largest number in Indonesia with 1,656 out of a total of 3,102 hospitals, or around 53.38%. Regional 1, which consists of DKI Jakarta, Banten, West Java, Central Java, Yogyakarta Special Region, and East Java, was chosen because it has the largest population among other regions.

The authors then determined the appropriate course of action for fireworks injuries by referring to the results of previous studies. The type of action chosen is the action that is in the outpatient group. The choice of outpatient treatment is supported by the results of Nizamoglu et al. (2018), Bitter et al. (2021), Maassel et al. (2021), and Winicki et al. (2023), which show that the probability of a patient being examined and discharged (outpatient) is

greater than the probability of a patient being hospitalized. With the type of injury suffered by the patient, the authors used the procedures and rates as listed in Table 3 below.

Table 3.

Fireworks Injury Treatment Procedures and Rates

Types of Procedures	Tariff (Rp)
Major skin transfer procedures in burns	1.075.100
Wounds Treatments	193.100
<i>Rontgen</i>	109.300

Source: Minister of Health Regulation (Processed by the Author).

The value listed on the tariff is the minimum loss that must be borne by 1 patient limited to the 3 most common injuries, namely major skin removal procedures on burns for patients with burns, wound care procedures for patients with bruises/scrapes, and X-ray procedures for patients with indications of fractures or sprain.

Prospects of Fireworks Business in Indonesia

Enjoying the new year or commemorating some important events is incomplete without fireworks. In a year, there are at least two sizable fireworks displays in Indonesia, namely on New Year's Eve and Eid al-Fitr. This affects the existence of the fireworks industry which is also usually seasonal. However, even though the fireworks business tends to be seasonal, this business can generate attractive profits. You can imagine how many fireworks are sold in one New Year's Eve, many cities in Indonesia set off fireworks.

Reporting from idxchannel, fireworks sellers are able to make a profit of IDR 20,000 to Rp. 30,000 per pack (1 pack = 5 boxes) of fireworks. In fact, reported by the local Palangkaraya newspaper, one of the traders in the city during Ramadan in 2017 was able to get a turnover of up to 15 million a day. Seeing the rising trend of fireworks imports, the fireworks business in Indonesia has a promising opportunity. Even in 2014, there was a discourse that PT Pindad Persero wanted to expand its production into fireworks.

Analysis

Fireworks as New Excisable Goods

Fireworks are widely used by Indonesian people to celebrate holidays such as New Year, Christmas, Chinese New Year, Eid al-Fitr, and Eid al-Adha. In the data and facts section, the negative impacts of fireworks have been discussed from a health standpoint and the material losses incurred. Apart from these two negative impacts, there are several other negative impacts such as air pollution, noise pollution, and water pollution.

A study by the Indian Institute of Technology Guwahati and the Indian Institute of Technology Delhi has analyzed excessive air and noise pollution caused by fireworks during Diwali (India's national holiday) and their potential impact on human health.

a. Air pollution

Sodium Perchlorate is a primary ingredient for making rocket fuel and the gunpowder used to set off fireworks. Fireworks that are fired and exploded leave chemicals and waste in the atmosphere. When fireworks rise and explode, Sodium Perchlorate and other chemical particles will spread in the air. This is the source of health problems in humans. Pregnant women, children and people with chronic asthma are the most vulnerable to exposure to chemicals from fireworks which can cause health problems in the throat, nose and eyes, and can also cause headaches and mental health. This health impact will be more severe in people who have respiratory, heart, or nervous system disorders. The results of research by scientists from the Indian Institute of Technology Guwahati and the Indian Institute of Technology Delhi show that small particles (<10 micrometers in diameter) in the air after the use of fireworks on Diwali have increased by around 65% (sixty five percent). Diseases such as chronic or allergic bronchitis, bronchial asthma, sinusitis, rhinitis, pneumonia, and strep throat are examples of diseases that arise as a result of inhaling air exposed to chemicals.

b. Noise Pollution

Noise is another impact that has harmful effects. According to the Decree of the Minister of Manpower Number PER-51/MEN/1999, ACGIH 2008 and SNI 16-7063-2004, the Noise Threshold Value is 85 dB. Exploding fireworks have a bang exceeding 140 dB, which means the sound of exploding fireworks can damage hearing. An eardrum that picks up sound beyond its threshold can also cause anxiety, temporary or permanent hearing loss, high blood pressure, and sleep disturbances. Even worse, the sound of fireworks explosions can cause death in people with heart disease and cause relapses in people with epilepsy. Apart from humans, the sound of fireworks exploding can also trigger stress in animals.

c. Water Pollution

Chemical particles resulting from fireworks explosions can fall into bodies of water such as rivers, reservoirs, lakes or other water reservoirs. Please note that Sodium Perchlorate is easily soluble in water. According to Rampengan (2013) who studied perchlorate compounds, perchlorate can inhibit iodine transport to the thyroid gland. Long-term use can cause severe side effects such as aplastic anemia, agranulocytosis and impaired kidney function.

Based on some of these negative impacts and considering the fact that the fireworks business has lucrative prospects, it is very possible for fireworks to become a new excisable item due to the huge detrimental impacts which include air pollution, sound pollution, water pollution, causing personal injury and/or someone else. In several countries, fireworks are categorized as excisable goods with different rates, such as in China, Laos, Myanmar and the United States. The government can reduce the harmful effects of fireworks by imposing excise so that the consumption and distribution of fireworks in society can be controlled and monitored in accordance with the philosophy of excise collection.

Potential Material Losses

Based on the negative impact data from the use of fireworks as described above, we know that goods full of impressions of celebration and happiness can also be disastrous for users and the environment. Starting from the impact on health to material losses, everything must be borne by the victim. With so many negative impacts that may arise, the authors calculate the potential material losses that must be borne by the victims.

Based on data and facts on the value of fireworks production in Indonesia, during the period 2017 to 2022, fireworks have a production value of IDR 628,546,480,441. Not only from domestic production, the need for fireworks in Indonesia is also supplied from foreign markets which are dominated by China. The total import value of fireworks in Indonesia reached \$108,629,308. Assuming an exchange rate of \$1 = Rp. 15,000, then the import value of fireworks will reach Rp. 1.63 trillion. If combined, the total value of the production and import of fireworks reaches approximately IDR 2.26 trillion.

On the other hand, the use of fireworks always carries a risk, which can result in injury and/or material loss. The number of victims injured by fireworks fluctuates every year, based on the CPSC Annual Report in 2022. Using the database of injured victims of fireworks in the United States by the CPSC, the authors will use these figures to calculate an estimate of the number of Indonesian residents affected by injuries due to the use of fireworks. To calculate the number of injured victims, the author first uses population data in Indonesia in the range from 2017 to 2022. Based on data from the Central Statistics Agency, details of the total population of Indonesia in 2017 to 2022 can be seen in the Total Population column in Table 4.

Based on the CPSC Annual Report, it can be seen that for every 100,000 population, there is a 2.8x to 4.7x chance of injury (column multiplier in Table 4). Of the total population, the authors divide the total population by 100,000 population then multiplied by a multiplier

factor to calculate the estimated number of injured victims. The calculation results can be seen in Table 4 below.

Table 4
Calculation Results of the Estimated Number of Injured Victims

Year	Population (in thousands)	Per 100.000 Population	Multiplier	Total Victims
2017	261.355,5	2.614	4,0	10.454
2018	264.161,6	2.642	2,8	7.397
2019	266.911,9	2.669	3,0	8.007
2020	270.203,9	2.702	4,7	12.700
2021	272.682,5	2.727	3,5	9.544
2022	275.773,8	2.758	3,1	8.549

Source: Processed by the author.

The estimated number of people injured by fireworks is then multiplied by the value of the material losses incurred by the victims (see Table 3). Material damages include medical expenses for treatment and recovery of injuries. If it is assumed that there is only one victim in a fireworks accident, the total material loss is calculated in Table 5 below.

Table 5
Potential Material Loss of Victims of Fireworks Accidents

Year	Total Victims	Burn Treatment Procedure (Tariff Rp 1.075.100 * Total Victims)	Bruises/Scratches Procedures (Tariff Rp 193.100 * Total Victims)	Bone Fracture Procedure / Sprain (Tariff Rp 109.300 * Total Victims)	Total Loss (Rp)
2017	10.454	11.239.331.922	2.018.709.882	1.142.646.246	14.400.688.050
2018	7.397	7.952.003.812	1.428.268.939	808.440.161	10.188.712.912
2019	8.007	8.608.709.511	1.546.220.637	875.204.120	11.030.134.268
2020	12.700	13.653.322.006	2.452.289.535	1.388.064.455	17.493.675.996
2021	9.544	10.260.633.451	1.842.924.676	1.043.146.904	13.146.705.031
2022	8.549	9.191.016.784	1.650.809.544	934.404.367	11.776.230.695
Total					78.036.146.951

Source: Processed by the author.

Assuming that all victims require these three medical procedures, the total minimum material loss is IDR 78,036,146,951. This value could be higher if fireworks accidents do not only injure one victim. In addition, with the most likely injury being burns, there is a possibility that the medical staff will perform additional procedures because bruises/scrapes

and fractures can occur along with burns, requiring treatment and x-rays to anticipate. Therefore, the author assumes that each victim received 3 medical procedures.

With these total losses, the negative health impacts of fireworks amount to 3.46% of total fireworks production and imports. While this figure may seem small at first glance, it is important to remember that this is a minimal loss because it is based on the assumption that each incident only affects one person. In reality, the number of victims can be much higher in each incident. In addition, this calculation does not include the possibility of more serious injuries that require more money to treat and deaths that may not be valued in money. In addition, there are other losses that have not been accounted for in this study, such as property damage from firework explosions.

Fireworks Excise Tariffs in Other Countries

Countries that apply excise duty on fireworks are countries that currently use fireworks as a form of celebration. In the United States, a country with one of the largest independence celebrations in the world, namely Independence Day which falls on July 4, implements excise duties on fireworks in several states. Reporting from taxfoundation.org, the American Phytotechnic Association explains that the fireworks market in America is worth \$ 1.3 billion, with \$ 945 million obtained from the sale of fireworks to ordinary consumers. This figure is certainly an interesting thing to get income for the states in America. Reporting from kiplinger.com, fireworks excise rates in several states in America can be seen in Table 6 below:

Table 6
Excise Rates of Fireworks in American States

States	Excise Rates of Fireworks
Georgia	5%
Indiana	5%
Michigan	6%
Pennsylvania	12%
West Virginia	12%

Source: kiplinger.com.

In ASEAN, there are already two countries that impose excise taxes on fireworks. The imposition of this tariff on fireworks is a follow-up to the concept of an environmental tax. The first country is Myanmar with a 5% tariff on fireworks transactions. This is an even rate applied to several objects that can affect the environment, including batteries, air conditioners, ceremonial paper, and hydrocarbon chemicals. The implementation of excise tax in Myanmar

is aimed at addressing the negative externalities generated from goods that can pollute the environment.

Another ASEAN country that imposes excise taxes on fireworks is Laos. The rate is very high compared to other countries, at 80% based on the latest Tax Law Amendment of 2015 (10% higher rate than the 2005 Tax Law). In comparison, the highest rate of excise tax on alcohol is 70%. This high excise tax rate is an attempt by the Lao government to address and monitor the problems caused by fireworks, including the many fireworks-related accidents that have resulted in fatalities and the environmental hazards caused by fireworks waste.

China, the world's largest producer and exporter of fireworks, has imposed an excise tax on firecrackers and fireworks. This is intended to achieve the function of revenue and supervision of the fireworks industry in the country. Reporting from china-tax.net, China applies a 15% tariff on each consumption of fireworks. The excise tax on fireworks is juxtaposed with other excisable goods such as tobacco and alcohol.

From the various practices of applying excise tax to fireworks, the rate charged is a percentage of the fireworks consumption transaction. It should be noted that setting an excise tariff on a good can affect the industry of that good. In determining the tariff for excise, there are several types of tariffs, as follows:

a. Specific Tariff

Specific tariffs are excise tariffs based on certain units of BKC. Examples are weight of tobacco, number of cigarettes, and volume of alcohol. This tariff provides control in the form of monitoring BKC per unit so that it can be monitored in more detail about how many units have been sold and circulated in the community. This becomes important when the BKC in circulation is an item whose distribution must be properly monitored and must not be circulated without a license.

This tariff certainly has both advantages and disadvantages. One of the advantages of this tariff is the ease of administration where all types of goods with certain criteria are subject to the same excise tax so that supervision becomes easier. Meanwhile, the disadvantage of this tariff is that the application of specific excise tariffs can encourage the creation of an oligopoly market where only a few large factories control the market. This happens because in the specific tariff, the imposition of excise tax between large factories and small factories is the same so that the burden borne between the two factories will be differ.

b. Ad Valorem Tariff

In contrast to specific tariffs, Ad Valorem tariffs are tariffs based on the percentage imposed on the Retail Selling Price (HJE), distributor selling price, import price, or factory selling price. The imposition of this tariff can be affected by changes in the price of goods subject to excise. When the price of BKC decreases, the state revenue from BKC will also decrease. One of the advantages of applying an ad valorem tariff is that this tariff upholds the level of justice for the manager of the goods subject to excise. The application of tariffs to large and small factories is in accordance with their respective sales proportions. However, this tariff has the disadvantage that the government can distort the market. Determining criteria such as HJE, class, and packaging type for BKC can prevent the market from developing and the impact will refer to the industry itself.

In determining what tariff can be applied to an excise-imposed item, there are several things to consider such as ease of administration, supervision, market conditions, inflation, the impact of negative externalities of an item, and others. This is the impetus for the government to apply the most optimal excise tariff with the above considerations. Mistakes in determining excise tariffs can have fatal consequences, both for state revenue and for society.

Potential Fireworks Excise Revenue

In the previous section, we discussed the potential material losses that must be borne by the victims, which amounted to IDR 78 billion (see table 5). By comparing this value with the total production and import of fireworks of 96 million kilograms (see table 1), the specific rate of fireworks excise tax that can be proposed is IDR 809.64 per kg. This specific rate is the minimum rate that can be imposed on fireworks to cover the cost of injury. It is said to be the minimum rate because the assumption for calculating the cost of injury is that one accident causes one victim. This rate can be higher if a single accident causes more than one victim, deaths that may not be valued in money, and/or property damage.

If an ad valorem tariff is used, using benchmark excise tariffs from other countries that range from 5% to 80% (see table 6) of the selling value (see table 1), the potential state revenue that can be generated ranges from IDR 93.83 billion to IDR 1.50 trillion.

Table 7
Potential State Revenue from Fireworks Excise

No.	Excise Tariff Types	Tariff	Potential State Revenue
1.	Spesific	Rp 809,64/ kg	Minimum Rp 78.036.146.951
2.	Minimum <i>Ad Valorem</i>	5%	Rp 93.834.578.053
3.	Maximum <i>Ad Valorem</i>	80%	Rp 1.501.353.248.848
4.	China <i>Ad Valorem</i>	15%	Rp 281.503.734.159

Source: Processed by the author

To facilitate supervision in the field, excise payments can be made in various ways, such as payment, attachment of excise tapes, and affixing other payment marks. In the case of fireworks excise, the author argues that the most appropriate way to pay excise is by attaching excise tapes and doing so before the goods are released from the factory. The design of the excise tapes used should follow the design of Beverages Containing Ethyl Alcohol factories or Tobacco Products factories that have personalization in their excise tapes. Thus, the attachment of personalized excise tapes will assist law enforcement officials in monitoring fireworks in circulation, such as distinguishing between illegal and legal fireworks or licensed and unlicensed entrepreneurs/importers.

Types of Fireworks Subject to Excise Taxes

Some countries have implemented excise taxation on fireworks. For example, Georgia, which imposes a 5% excise tax on the sale of fireworks in the state, levies excise taxes on (1) consumer fireworks; (2) wire or wood sparklers of no more than 100 grams of mixture per item; (3) other sparkling items that are non explosive, non aerial, and that contain no more than 75 grams of chemical compound per tube or a total of up to 500 grams for multiple tubes; (4) snake and glow worms; (5) smoke devices; and (6) trick noise makers, which include paper streamers, party peppers, string peppers, snappers, and drop pops, each consisting of 0.25 grains or less of explosive mixture. The excise tax is payable and shall be paid in the same manner as sales tax and shall be paid by the seller. Any seller who willfully and knowingly violates the requirements of the excise tax is subject to a civil penalty of up to \$10,000 in addition to the amount of excise tax due (Georgia HB 110 Laws, 2015).

In Indonesia, the use of fireworks is regulated in the Indonesian National Police Regulation No. 17/2017 on Licensing, Security, Supervision and Control of Commercial Explosives. The regulation states that fireworks measuring less than two inches or less than 20 grams of gunpowder do not require a purchase and use permit. Meanwhile, fireworks for performances measuring two to eight inches or more than 20 grams of gunpowder require a

purchase and use permit from the National Police Headquarters. Meanwhile, fireworks containing high-explosive materials, commonly known as firecrackers, have been banned in Indonesia. Therefore, the author argues that fireworks subject to excise tax are all types of fireworks that can be sold or have commercial value.

Discussions

Fireworks as a symbol of celebration apparently do not fully bring happiness. On the other hand, fireworks apparently have a negative impact on society, such as injuries, serious injuries, and even death. This impact of course also results in material losses that they have to bear. Based on the public interest theory presented by Wedari (2023) that the government needs to make regulations to overcome externalities, especially those that have a negative impact on society. Fireworks which have externalities both in terms of health and in terms of material losses need to be addressed with the help of the government's role in the form of implementing excise. This is in accordance with an argument by Pigou (1920, quoted in Hidayat & Suriono, 2016), that commodities that have negative impacts need to be overcome by imposing taxes on these commodities.

Based on this, fireworks are one of the characteristics of excisable goods, namely that their use can have negative effects on the environment and society. Thus, the implementation of excise duty on these goods needs to be a concern for the government. The formulation of excise collection policies on fireworks includes the type and value of tariffs, collection methods, and groups of fireworks items that will be subject to excise. By formulating an appropriate excise tax collection policy for fireworks, this negative externality can then be reduced. Apart from that, the excise collected can become a source of state revenue, which is then used to overcome problems resulting from externalities from fireworks.

5. CONCLUSION

Based on the research results, by referring to the public interest theory which states that the government acts as a policy maker for the public interest, it can be concluded several things as follows:

- a. Fireworks meet the criteria as new excisable goods because of their characteristics which have a negative impact on society and the environment, so that their distribution needs to be monitored and their consumption needs to be controlled.
- b. The excise rate that can be imposed is a minimum of IDR 809.64 per kilogram for specific excise rates or 5% to 80% of the selling price for ad valorem excise rates.

- c. Potential state revenue that can be obtained from the imposition of excise duty on fireworks is IDR 78 billion for specific excise rates or around IDR 93.83 billion to IDR 1.50 trillion for ad valorem excise rates.

By looking at the potential for material losses, the prospects for the fireworks business, and the potential for state revenue generated, the authors recommend the relevant agencies, in this case the Directorate General of Customs and Excise, to consider setting excise duty on fireworks.

6. LIMITATIONS AND SUGGESTIONS.

Research Limitations

There is no relevant data regarding material losses caused by fireworks accidents, so in this study the data used were data from other countries and then processed by the author. If at a later date there is relevant data, the excise rate can be recalculated.

Suggestions

The potential for developing research regarding fireworks excise is still very broad. It is recommended that future research use more relevant data and also analyze more deeply the impact of excise duty on fireworks in Indonesia. Apart from that, the government, especially the Ministry of Health, is expected to be able to provide more complete data regarding data related to fireworks accidents.

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