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The challenges of tax policy: a literature study on market and welfare dynamics

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ABSTRACT

Taxes are the government's primary tool for collecting revenue, but their implementation presents challenges such as deadweight loss, market shrinkage, and impacts on welfare and economic efficiency. Appropriate tax policy is needed to optimize state revenue while maintaining market balance and public welfare. The purpose of this study is to deeply analyze how tax policy affects market dynamics and economic welfare, both on the producer, consumer, and government sides. This research uses a qualitative literature review approach to analyze the impact of tax policy on market dynamics and economic welfare. Data was gathered through documentation from academic sources such as Google Scholar, PubMed, and ScienceDirect, focusing on publications from the last five years. The data was analyzed in three stages: reduction, presentation, and conclusion drawing, to provide a comprehensive, evidence-based understanding and policy recommendations. The study finds that tax policy implementation often results in deadweight loss, reflected in the decrease in total surplus for both producers and consumers. Taxes on elastic goods and services tend to severely impact welfare, highlighting the need for more careful policy design. High tax rates can shrink the market size, ultimately reducing government revenue. Policymakers must balance elasticity levels between producers, consumers, and tax rates to optimize both economic welfare and state revenue. To improve effectiveness, concrete policies are needed, such as progressive tax rates, regular monitoring of tax impacts, and incentives for certain sectors.



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Introduction

Tax is a mandatory contribution to individuals or business entities, without direct contrainterpretation, and can be imposed by the government based on the law, to finance government public needs (Rahayu, 2020). Law Number 1, Year 2022 concerning Financial Relations between the Government and Regions, which is the result of the refinement of Law Number 28, Year 2009 concerning Regional Taxes and Regional Levies aims to create an efficient, transparent, accountable, and fair allocation of national resources in an effort to realize equal distribution of public services and public welfare in all corners of the Unitary State of the Republic of Indonesia (Wulandari et al., 2024).

Tax policy plays a critical role in shaping the welfare of producers, consumers, and the overall size of a country's market. At its core, tax policies directly impact market behavior, often leading to changes in consumer surplus and producer surplus (Wulandari et al., 2021). Consumer surplus refers to the difference between what consumers are willing to pay for a good or service and what they pay. When taxes are levied on goods or services, the resulting price increase typically reduces the consumer surplus, thereby diminishing consumer welfare. Conversely, producer surplus, which represents the difference between the price at which producers are willing to sell and the actual price they receive, can also be adversely affected by taxes that increase production costs. The dynamics between these two surpluses are essential in evaluating the broader economic effects of taxation on market participants (Irawan & Ulinnuha, 2022; Widati et al., 2024).

The imposition of taxes can influence the market size by altering both supply and demand conditions. Higher taxes often discourage consumption by raising prices, which in turn reduces demand (Helm & Mier., 2021). Similarly, when taxes increase the cost of production, suppliers may reduce their output or increase prices to maintain profitability. These changes can shrink the size of the market, as both consumers and producers adjust their behavior in response to the increased financial burden. Therefore, understanding how tax policy affects the equilibrium between supply and demand is critical for policymakers who aim to balance revenue generation with maintaining a healthy, competitive market (Vakaskova et al., 2021).

The welfare implications of tax policies are particularly complex because they involve a trade-off between equity and efficiency. Progressive taxes, which aim to redistribute income, can potentially improve social welfare by alleviating income inequality (Rajagopalan et al., 2022). However, such taxes can also distort market behavior, leading to inefficiencies in production and consumption. For example, high taxes on goods may result in the reduction of market activity and consumer choice, while high corporate taxes could lead to lower investment levels, stunting long-term economic growth. Thus, policymakers must consider the delicate balance between raising revenues for public goods and services while minimizing adverse effects on overall market functioning (Mpofu., 2022).

Despite the importance of tax policy in shaping market dynamics, various challenges make it difficult to achieve an optimal policy framework. One key challenge is tax evasion, which undermines the effectiveness of tax systems by reducing the expected revenue, thereby forcing governments to increase tax rates or create new taxes (Challoumis., 2024). Informality in the economy also poses a significant challenge, as many businesses and individuals operate outside of the formal tax system, resulting in significant revenue leakage. Additionally, the political and social context often influences tax policy decisions, with differing ideologies affecting the design of tax structures. These challenges require careful consideration and continuous reform to ensure that tax policies support both short-term economic stability and long-term growth (Fastenrath et al., 2021).

Research Herlina & Murniati (2023) tell that tax, tunneling incentives, and foreign ownership each have a positive effect on transfer pricing, suggesting that these factors encourage firms to manipulate prices for their own benefit. In particular, the tax factor likely motivates companies to adjust transfer prices to minimize tax liabilities, while tunneling incentives may lead firms to shift profits in ways that benefit controlling shareholders. Similarly, foreign ownership could be linked to transfer pricing practices as multinational companies often engage in such strategies to optimize their global tax positions. On the other hand, the study found that the bonus mechanism and company size did not have a significant impact on transfer pricing, indicating that these factors might not be as influential in shaping transfer pricing decisions within the context of the companies studied.

The novelty of the main issue in this research lies in assessing the impact of taxes on deadweight loss and economic welfare. Deadweight loss refers to the loss of economic efficiency that occurs due to taxes, which changes the behavior of consumers and producers, creating an imbalance between supply and demand in the market. This study focuses on exploring how taxes can create distortions in the market, which in turn affect economic welfare, both in terms of consumer and producer welfare. Such impacts lead to shifts in consumer and producer surplus, which can reduce the overall effectiveness of the economy. The purpose of this study is to understand in depth how tax policy affects the distribution of resources in the economy, as well as provide insights for policymakers to design more efficient and fair tax policies, which can minimize deadweight loss and improve the economic welfare of society at large.

Method

This research uses a literature review method with a qualitative approach, which aims to analyze various relevant literature related to tax policy and its impact on market dynamics and economic welfare. This method involves collecting, reviewing, and synthesizing data from scientific journals, books, research reports, and other reliable sources to explore theoretical and empirical insights. A qualitative approach is used to deeply understand

the relationship between tax policy, elasticity of demand and supply, and its impact on producers, consumers, and government revenue (Ruiz-Fernández., 2021). With this approach, the research seeks to present a comprehensive and structured analysis, while providing evidence-based recommendations relevant to policymakers.

The data collection technique in this study was carried out by documentation, namely by collecting and analyzing various relevant written data sources. Data was obtained through access to scientific literature such as journal articles, books, research reports, and other documents that support the research topic (Morgan., 2022). The sources were searched using academic search engines such as Google Scholar, PubMed, and ScienceDirect, with a limitation of publications within the last five years to ensure relevance and novelty of the information. This documentation technique enabled the research to obtain comprehensive and valid secondary data, which was then systematically analyzed to answer the research questions and provide evidence-based recommendations (Taherdoost., 2021).

Data analysis in this study was conducted through three main stages, namely data reduction, data presentation, and conclusion drawing. In the first stage, data collected from various literature sources were filtered and selected to ensure that only information relevant to the research topic was used. Next, the reduced data was organized and presented in a structured manner, either in the form of descriptive narratives, tables, or graphs, to facilitate the understanding of the relationship between tax policy, elasticity, and economic welfare. In the last stage, the researcher draws conclusions based on the findings, which include interpreting the results of the analysis and providing policy recommendations that can be implemented. This process aims to provide a comprehensive and evidence-based understanding of the impact of tax policy on markets and economic welfare (Hamzani et al., 2023).

Results and Discussions

Loss of Standard Tax Expense

Sarmento (2023) says that, it makes no difference whether the tax on an item is imposed on the buyer or seller. When a tax is imposed on a buyer, the demand curve shifts downward according to the amount of tax. Conversely, when the tax is imposed on the seller, the supply curve shifts upwards according to the amount of the tax. In both cases, when taxes are imposed, the price paid by buyers increases, while the seller's income decreases. Ultimately, buyers and sellers share the tax burden, regardless of how the tax is charged, as Figure 1 shows.

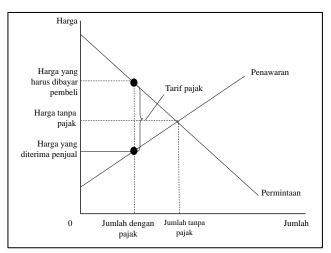


Figure 1 < Impact of Taxatio. Source: Sarmento (2023)>

In the Indonesian economy, the analysis of taxes and their impact on the shifts in the demand and supply curves, as well as deadweight loss (the loss due to inefficiency), is highly relevant in understanding the dynamics of the domestic market. When taxes are imposed on goods, either on the seller or the buyer, one of the curves will shift, depending on who is taxed. For example, if the tax is levied on the seller, the supply curve will shift upward, as the seller will be less willing to offer the goods at the same price after the tax is imposed. On the other hand, if the tax is imposed on the buyer, the demand curve will shift downward, as buyers will be more reluctant to purchase the goods at a higher price due to the added tax.

This shift in the curve creates a "price wedge" between the price paid by the buyer and the price received by the seller, leading to a reduction in the quantity of goods traded in the market. This results in deadweight loss,

which is the welfare loss that occurs due to the reduction in transactions. Without the tax, the quantity of goods exchanged is at the market efficiency point, where consumer and producer surpluses are maximized. However, when the tax is applied, fewer transactions occur, leading to a decrease in the surplus that would have otherwise been received by consumers and producers.

Previous research supporting this concept notes that taxes, while increasing government revenue, often lead to market inefficiency. Studies such as those by Bagger et al., (2022); Rahman (2022) show that taxes reduce consumer and producer surpluses, which is reflected in the deadweight loss. In Indonesia, research like that conducted by Torres et al., (2024) in analyzing the impact of taxes on specific economic sectors shows that the extent of deadweight loss can vary depending on the elasticity of demand and supply. When demand or supply is more elastic, deadweight loss tends to be greater. Therefore, the government needs to consider this inefficiency when designing tax policies that strike a balance between revenue generation and economic efficiency (Kemboi., 2024).

Taxes Affect Market Participants

Gains and losses due to taxes on goods, must take into account the way taxes affect buyers, sellers, and governments. The profit that buyers earn in a market is measured by consumer surplus, that is, the price that buyers are willing to pay for a good minus the price actually paid by them for that good. The profit earned by sellers in a market is measured by producer surplus, that is, the price received by sellers of a good minus production costs (Li & Chau, 2024). In contrast, government revenue from taxes is measured based on the tax rate or T multiplied by the amount of sales or Q represented by the rectangular area between the supply and demand curves (McDonald & Larson, 2020). The height of the rectangle is a measure of the amount of tax, in this case T, and the length is a measure of the number of goods sold, in this case Q, as shown in Figure 2. The government obtains tax revenues of $T \times Q$ used to provide services to the community, such as education, health, transportation facilities, social assistance, and so on. Therefore, government revenues from taxes can be used to analyze the way taxes affect the state of the economy.

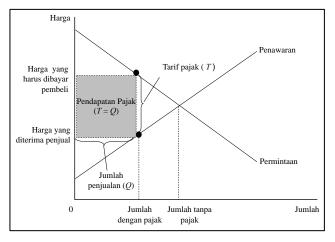


Figure 2 < Government Revenue from Taxes. Source: Sarmento (2023)>

Tax-Free Welfare

Tax-Free Welfare is a concept that explores the relationship between taxes and the well-being of society, particularly in how they influence the total economic surplus. In a tax-free market, the allocation of resources is efficient as there is no distortion introduced by taxes. The equilibrium price (P1) and quantity (Q1) are determined by the intersection of the supply and demand curves (Ariffin, 2023). The consumer surplus, represented by the area A+B+C, captures the net benefit to consumers from participating in the market, as it shows how much they are willing to pay over and above what they actually pay. On the other hand, producer surplus, represented by the area D+E+F, reflects the net benefit to producers, showing how much more they receive for their goods than their minimum acceptable price (Bennett, 2022).

Before the government imposes taxes, the total surplus, which is the sum of the consumer and producer surpluses, is maximized. This surplus is represented by the combined area of A+B+C+D+E+F, signifying the total net benefit to society from the efficient allocation of resources. There is no loss to either consumers or producers, and no government revenue is generated. This tax-free scenario reflects an optimal situation where market participants both consumers and producers benefit to the fullest extent without any external interference. The absence of taxes ensures that the market operates at its most efficient level, maximizing overall welfare (Emami et al., 2021).

Previous research supports this view of tax-free welfare as an ideal situation for market efficiency. Studies, such as those conducted by Quenti et al., (2022) emphasize that the presence of taxes in a market tends to reduce both consumer and producer surplus, leading to a deadweight loss. This deadweight loss represents the reduction in total welfare due to the tax burden. When taxes are absent, the total welfare, represented by the sum of consumer and producer surpluses, is at its peak. Moreover, empirical studies on tax policies, such as those by Folorunsho (2024) also highlight the efficiency of tax-free welfare systems in promoting economic growth and societal well-being. Thus, the concept of tax-free welfare presents a baseline for understanding the impacts of taxation on market dynamics and social welfare.

After-Tax Welfare

Economic well-being after tax charges can be analyzed by examining the shifts in consumer and producer surplus due to the imposition of the tax. Initially, the price paid by buyers rises from P1 to PB, leading to a reduction in consumer surplus (Zhang et al., 2023). This surplus, which is the area under the demand curve and above the price paid by the buyer, is now smaller and equal to area A. Similarly, the price received by producers decreases from P1 to PS, leading to a reduced producer surplus, which is now confined to area F, under the supply curve and below the seller's price. As a result, both the consumer and producer surpluses are diminished by the tax, impacting economic well-being by reducing the overall total surplus in the market (Kallianiotis, 2022).

In addition to these changes, the sales amount drops from Q1 to Q2, indicating that the quantity of goods traded in the market has decreased due to the tax. This reduction in trade results in a loss of economic efficiency, often referred to as deadweight loss. The government collects revenue from the tax, represented by the area B+D. While government revenue is a benefit to the public sector, it does not contribute to the consumer or producer surplus and does not fully compensate for the losses incurred by consumers and producers. Deadweight loss occurs because the tax distorts the market equilibrium, reducing the total surplus that would have existed without the tax (Sun et al., 2024).

The overall total surplus, after accounting for the tax, can be expressed as the sum of the consumer surplus, producer surplus, and government revenue. In this case, it is represented by the area A+B+D+F. However, the total surplus in the market is now smaller than it would have been without the tax due to the deadweight loss. Previous research, such as the study by Grebe et al., (2021) has highlighted how taxes can cause deadweight loss by reducing the quantity traded and lowering both consumer and producer surplus, while transferring some of that value to the government in the form of tax revenue. This illustrates the trade-off between generating government revenue and the economic inefficiencies that result from taxing market transactions.

Change of Wellbeing

The impact of taxes can be seen by comparing before and after taxation. The third column in Table 1 shows these changes. Taxes cause consumer surpluses to decrease by B+C areas and producer surpluses to decrease by D+E areas. Government revenues from taxes increase by B+D areas. Changes in total welfare include changes in consumer or negative surplus, changes in producer or negative surplus, and government revenues from taxes or positive changes. When these three surpluses are added up, the total surplus in the market will decrease by the area of C+E. Thus, the loss of consumer surplus and producer surplus due to taxes is greater than the income increased by the government. A decrease in total surplus that occurs when taxes or other policies, will change the market yield in the form of deadweight loss, as wide as C+E is a measure of raw expense loss.

Mohammed & Tangl., (2023) says that to understand why taxes pose a raw burden loss is because "society responds to incentives". Markets usually allocate scarce resources efficiently. That is, the balance of supply and demand maximizes the total surplus of buyers and sellers in a market. However, when taxes result in an increase in prices for buyers and decreases in prices for sellers, taxes disincentivize buyers to consume less and sellers to produce less *output* than they should. When buyers and sellers react to this disincentive, the size of the market shrinks under its optimal conditions. Thus, because taxes change incentives, they cause the market to allocate its resources inefficiently or die *weights*.

Component With Tax Change No Tax Consumer Surplus A+B+CΑ -(B+C) Produsen Surplus D+E+FF -(D+E) Tax revenue Tidak ada B+D +(B+D) Surplus total A+B+C+D+E+F A+B+D+F -(C+E) The area of C+E shows a decrease in total surplus and is a loss Standard Tax Expense

Table 1 < How taxes Affect Well-Being>

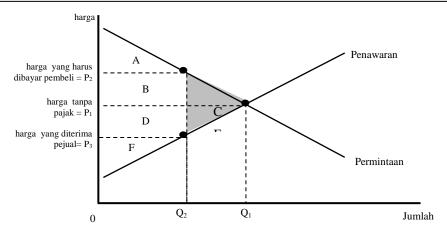


Figure 3 < How taxes Affect Well-Being. source: Sarmento (2023)>

Raw Load Losses and Trading Profits

To gain an understanding of why taxes result in raw expense losses, an example can be shown. Imagine that Joe cleans Jane's house for \$100 a week. Joe's opportunity cost of his time is \$80, and the value of a clean house to Jane is \$120. So, Joe and Jane each received \$20 worth of profits according to their agreement. A total surplus of \$40 represents the profit on their transactions.

Now, suppose the government charges a \$50 income tax to cleaning service providers. Now there is no longer a price level Jane can pay Joe so that both of them can still benefit after being taxed. The highest wage Jane wants to pay is \$120. However, Joe will only earn \$70 after paying taxes, less than his \$80 opportunity cost. Instead, in order for Joe to receive his \$80 opportunity fee, Jane must pay \$130, which is greater than \$120, which is the price Jane is willing to pay for cleaning the house. As a result, Jane and Joe cancel their deal. Joe leaves the place with no income, while Jane's house becomes dirtier.

The tax cost Joe and Jane \$40 because they lost that surplus. At the same time, the government also got nothing from Joe and Jane because they canceled their deal. So, the net raw expense loss is \$40. This is a loss for buyers and sellers in a market that is not offset by increased government revenue. This example can show the most important source of raw load loss. Taxes can incur raw expense losses because they prevent buyers and sellers from realizing trade profits with government interference.

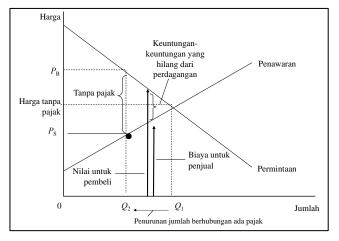


Figure 4 < Row Load Loss. Source: Sarmento (2023)>

The area of the triangle between the supply and demand curves, represented as C+E in Figure 3, illustrates the economic losses caused by the imposition of a tax. This loss of surplus can be most clearly understood by referring to Figure 4, where the demand curve reflects the value that consumers place on the goods and the supply curve reflects the costs faced by producers. When the tax is implemented, it results in an increase in the price paid by buyers, rising from P1 to PB, and a decrease in the price received by sellers, falling from P1 to PS. These changes cause some marginal buyers and sellers to exit the market, which reduces the quantity of goods sold from Q1 to Q2. The triangular area C+E, therefore, represents the total lost economic welfare from this reduction in trade.

As illustrated in the figure, the tax causes some trades that would have been mutually beneficial to not occur. The value of the goods to the marginal buyers still exceeds the cost of production for the sellers, indicating that the trades would have been profitable in a tax-free scenario. However, due to the tax, these transactions are no longer carried out. This situation reflects the core concept of deadweight loss, where the tax creates a wedge between the price that consumers are willing to pay (PB) and the price that producers are willing to accept (PS). Because these mutually beneficial trades do not take place, the surplus that would have been generated from these transactions is lost, resulting in a decrease in total economic welfare.

The raw expense loss, or deadweight loss, is a direct consequence of the tax. It represents the surplus that would have been enjoyed by both consumers and producers in the absence of the tax. However, due to the tax, these transactions no longer take place, and the potential benefits of trade are voided. As seen in the example with Joe and Jane, where the trade would have been beneficial to both parties, the tax effectively cancels out the mutually beneficial exchange, resulting in a reduction in total welfare. This lost surplus represented by the areas C and E illustrates the inefficiencies that arise in the market due to the imposition of taxes.

Determinants of Raw Load Loss

What determines raw load losses? Big or small tax consequences? According to Shi et al., (2021), price elasticity of supply and demand measures how much response to the quantity of goods supplied and the amount of goods demanded to price changes.

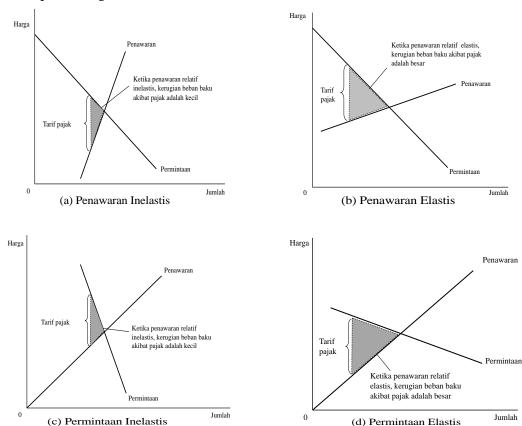


Figure 5 < Tax Distortion and Elasticity. Source: Sarmento (2023)>

Figure 5 showed that First, it is necessary to discuss how supply elasticity affects the size of raw load losses. In the two top panels in Figure 5, the demand curve and tax rate are the same. The only difference in this figure is the elasticity of the supply curve. In panel (a), the supply curve is relatively inelastic, i.e. the quantity supplied will not differ much in case of price changes. In panel (b), the supply curve is relatively elastic, i.e. the bid amount will be much different if the price changes. Consider the raw load loss that occurs, where the area of the triangle between the supply and demand curves becomes larger when the supply curve is more elastic.

Similarly, the two lower panels in Figure 5 show that the way demand elasticity affects the size of raw load losses. The supply curve and tax rate are made fixed. In panel (c) the demand curve is relatively inelastic, the raw load loss is small. In panel (d) the demand curve is more elastic, the loss of raw expenses due to taxes is greater.

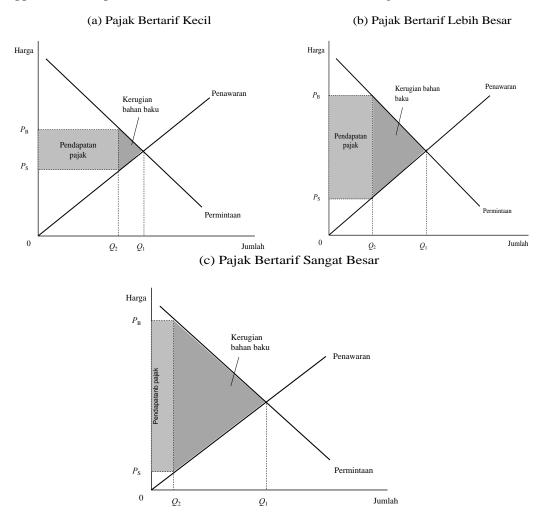
The key lesson from this figure is that taxes generate raw expense losses by altering the behavior of both buyers and sellers. As taxes increase, the price paid by buyers rises, leading them to reduce consumption. At the same time, taxes decrease the income received by sellers, prompting them to produce less. These changes in behavior shrink the size of the market, moving it away from the optimal quantity of goods being traded, where total welfare would be maximized. The imposition of a tax introduces inefficiencies in the market, as some mutually beneficial trades no longer occur, leading to a loss of economic surplus, as represented by the areas of deadweight loss.

The elasticity of supply and demand plays a crucial role in determining how much the tax affects market outcomes. Elasticity refers to how sensitive buyers and sellers are to price changes. When demand or supply is more elastic, buyers and sellers are more responsive to price changes. In such cases, a tax will cause larger shifts in behavior buyers reduce their consumption significantly, and sellers cut back on production more drastically. As a result, the market shrinks further, and the deadweight loss increases. The greater the elasticity, the larger the reduction in the quantity traded and the higher the losses in consumer and producer surplus.

Conversely, if supply and demand are inelastic, the responses to price changes will be smaller, and the market size will not shrink as much. In this case, the deadweight loss will be relatively smaller because the tax does not significantly alter the behavior of buyers and sellers. Therefore, the elasticity between demand and supply is a critical factor in understanding the magnitude of the economic losses caused by a tax. Greater elasticity leads to larger changes in market behavior and, consequently, greater raw expense losses, which means taxes become more costly to economic welfare in more elastic markets.

Loss of Raw Expenses and Tax Revenue Along with Tax Changes

The amount of tax will change over a long period of time. Policymakers in local, state, and federal governments always consider raising tax rates on the one hand or lowering tax rates on the other hand. As a result, what happens to raw expense losses and tax revenues when tax rates change (Meita & Nurdiniah, 2023).



Figur 6 < Loss of Standard Expense and tax Revenue with Three Different Rates. Sumber: Sarmento (2023)>

Figure 6 shows the impact of small, medium, and large rates of taxes by keeping the market supply and demand curve fixed. Standard expense losses, in the form of a decrease in total surplus, occur when taxes reduce the size of the market to below its optimal condition, which is equal to the area of the triangle between the supply and demand curves. For small-rate taxes on panel (a), the area of the raw load loss triangle is quite small. However, when tax rates increase, as in panels (b) and (c), the raw load losses become even greater.

In fact, the loss of raw expenses due to taxes increases much faster than the relevant tax rate. The reason is that the standard load loss is the area of a triangle, while the area of a triangle depends on the square of its size. When doubling the tax rate, such as the base and height of the triangle, doubles the raw load loss. When the tax rate is tripled, the base and height of the triangle triple, the raw load loss increases ninefold.

Government revenue from taxes is the tax rate multiplied by the number of goods sold. As shown in Figure 6, tax revenue is equal to the area of the rectangle between the supply and demand curves. For the small tax rate in panel (a), the government's revenue from taxes is also small. As the tax rate increases, like panel (b), tax revenue increases. However, once the tax rate increases dramatically, as in panel (c), tax revenue falls instead. That's because drastically increased taxes can drastically reduce the size of the market. For very large taxes, it will have the impact of no tax revenue at all for the government. This is by people will stop buying and producing goods.

Conclusions

Based on the results of the study, it is found that the implementation of tax policy often leads to deadweight loss, which can be seen from the decrease in total surplus on both the producer and consumer sides. Taxes on elastic goods and services tend to significantly reduce the welfare of producers and consumers, emphasizing the importance of a more measured policy design. A tax rate that is too high can shrink the size of the market, which in turn reduces government revenue from taxes. Therefore, policymakers need to balance elasticity levels, both on the producer, consumer, and tax rate sides, to optimize economic welfare and state revenue. However, more concrete policies are needed, such as designing progressive tax rates based on the elasticity category of goods, establishing a mechanism for regular monitoring of tax impacts, and adopting incentives for certain sectors to encourage market growth. Further research is also needed to develop dynamic models capable of predicting long-term responses to tax policies and explore the relationship between taxation, market innovation, and informal economic activity, so that policy recommendations can be more effective and relevant for the Indonesian economic context.

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