The Short-Term Causality Management Between Economic Growth and Excise Revenue: Review of Economic Regulation and Accounting Best Practice

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Abstract

This study aims to find the Granger causality between economic growth and excise revenue. Does economic growth drive the increase in excise revenue, or vice versa, does excise revenue drive the increase in economic growth? To conduct this test, the Granger causality test is used. Observations were made from 1998 to 2018. This observation period was made considering that 1998 was the year after the economic crisis and 2018 was the last year the excise tariff policy was in effect before it became effective in 2019. Data sources were obtained from the government's state budget financial records. The results obtained are that there is no Granger causality between excise revenue (X_t) and economic growth (Y_t), but on the contrary, there is a Granger causality between economic growth (Y_t) and excise revenue (X_t). However, the performance of current excise revenue (X_t) is affected by the performance of excise revenue in the previous year (X_{t-1}), while the performance of excise revenue two years earlier (X_{t-2}) does not affect excise revenue this year (X_t). Similarly, economic growth in the previous year (Y_{t-1}) also has no significant effect on this year's excise revenue (X_t).

Keywords: Excise Revenue, Economic Growth, Granger Causality, Excise Revenue Elasticity.

Introduction

The debate on the effect of tax revenue on economic performance in an economy, especially in developing countries, is still ongoing (Babatunde et al., 2017; Garba, 2014). The role of taxes in influencing economic growth is not only a major concern of economic policy

makers, tax experts, and administrators, but has also been a concern of academics. Several studies have explored the role and impact of taxes on economic growth performance. Theoretically and empirically, researchers have tried to see the relationship between these variables, and found support for a significant relationship between taxes and economic growth (Herfindahl, 1957, Easterly et al., 1994, Karran, 1985,).

The discussion on the relationship between tax revenue and economic growth can be divided into two areas. First, it focuses on the impact of tax policy on economic growth. This discussion examines the impact of policy changes on economic growth (Poulson and Kaplan, 2008, Koch et al., 2005, Lee and Gordon, 2005) and concludes that tax distortions will reduce potential growth. In other words, there is a negative relationship between tax policy and economic growth. Second, it focuses on empirical examination of the relationship between tax revenue and economic growth, where the nature of the relationship can be negative, positive, or neutral, depending on how important a role tax revenue plays as a source of economic growth.

Higher tax rates may inhibit economic activity and economic growth. The most prominent studies supporting this hypothesis are those of Marsden (1983) and Koester and Kormendi (1989). Their results show that countries with higher tax rates produce lower growth rates. Okafor (2012) in his study using ordinary least squares (OLS) regression found that there is a positive and significant relationship between tax revenue and Gross Domestic Product (GDP) in Nigeria. Likewise, Chigbu et al. (2012) found in their study that taxes affect economic growth.

Tax itself is actually a mandatory payment from companies and households to the government (Goode, 1984). Governments in both developed and developing countries must play an active role in achieving economic growth (Edame and Okoi, 2014). In this case, fiscal policy is an important tool of the government to encourage economic growth. Taxes are an important part of fiscal policy. Many economists believe that tax revenue is one of the most important factors contributing to a country's economic growth. (Myles, 2000). This is consistent with the findings found by Helms (1985) in his research that state budget expenditures can encourage economic growth such as budgets to improve human resources and infrastructure, health care, schools, higher education, and roads that can generate long-term benefits and growth for the country.

Adriansyah (2014) in his research found a positive correlation between economic growth and tax revenue, but the growth rate of tax revenue is not as fast as the rate of economic growth (measured by GDP growth rate). Likewise, Adkisson and Mohammed (2014) examined the tax structure and economic growth of states during the Great Recession, using a sample of 50 states in the period 2004 to 2010, and found a relationship between tax revenue and economic growth even during the recession. Boediono (1992) states that the amount of economic growth is formed from the percentage increase or decrease in GDP based on constant prices or Real GDP which will affect tax revenues. This is also consistent with what Hanif (2005) stated that an increase in economic growth will increase people's purchasing power which in turn will increase their ability to pay taxes.

If the Gross Regional Domestic Product (GDP) of a region increases, the region's ability to pay taxes (ability to pay) will also increase. This has an impact on increasing government tax revenue. Amir et al. (2013) found three significant impacts based on the variation between

changes in tax revenue and government revenue. They noted that a decrease in government revenue will lead to a decrease in production, thus leading to a decrease in the country's financial capacity. In tax elasticity theory, the size of tax revenue can be affected by the tax base, especially GDP. On the other hand, there is the Keynesian aggregate production theory which states that one of the functions of the constituent components of GDP is taxation. But on the other hand, there are studies that differ in their results, such as the study conducted by Myles and Nethery in 2005, they investigated the relationship between excise revenue and economic growth in Canada. Their study showed that there was no significant positive relationship between Excise Revenue and economic growth. They concluded that other factors such as investment, unemployment rate, and fiscal policy stability have a greater influence on economic growth.

Given the contradiction between these two theories, it is necessary to prove whether there is a cause-and-effect relationship between tax revenue and economic growth in Indonesia. This proof is very important considering that tax management and government spending to increase economic growth are two important aspects of a country's fiscal administration. Both are interrelated and play a role in managing government revenues and expenditures to achieve economic and social goalsTop.

Literature Review

Keynesian Theory of Aggregate Output

Keynesian aggregate production theory is part of the Keynesian economic theory proposed by John Maynard Keynes. Keynes' aggregate output theory states that one of the components of gross domestic product (GDP) is taxes. This theory explains that if there is a change (increase) in tax revenue, it will have an impact on reduced disposable income so that it will affect public consumption. With reduced consumption due to an increase in taxes, this will eventually lead to a decrease in GDP (Mankiw, 2007).

In the theory of aggregate production, it is also assumed that the total output of a country is influenced by consumption, investment and fiscal policy variables, where the fiscal policy component is the component that the government can use to control the economy is tax and public spending policy. Taxes and public spending have different impacts on overall output, where the government must increase public spending if it wants economic growth and vice versa, it must reduce taxes if it wants economic growth.

Tax Elasticity Theory

One of the figures of Tax Elasticity Theory is Paul Samuelson (1915-2009), who was an American economist who won the Nobel Prize in Economic Sciences in 1970. Samuelson greatly contributed to understanding and applying the concept of elasticity in economics, including in tax analysis. Tax elasticity itself is an important economic concept in measuring the reaction of changes in tax revenue to changes in tax rates. In the context of fiscal policy, an understanding of tax elasticity helps the government in planning an effective and optimal tax system to achieve the desired economic goals.

The concept of tax elasticity can also be interpreted as a measure of the increase in tax revenue (in percent) due to endogenous changes in the tax base due to an increase in GDP (in

percent). Revenue elasticity can be divided into tax elasticity to the base and base-to-income elasticity (GDP).

$$\frac{Ef}{Y} = \frac{\triangle \%TR}{\triangle \%Y} = \frac{\frac{\triangle TR}{TRo} \; x \; 100}{\frac{\triangle Y}{Yo} \; x \; 100}$$

$$= \frac{\triangle TR}{TRo} + \frac{\triangle Y}{Yo} = \frac{\triangle TR}{\triangle Y} \; x \; \frac{Yo}{TRo}$$

Where:

Ef/Y = The elasticity coefficient of tax revenue, which is the amount, proportion, or percentage change in tax burden due to changes in economic growth or changes in other variables.

$\triangle TR$ = Change in tax revenue,

TR = Tax revenue,

$\triangle Y$ = Change in economic growth,

Y = Economic growth

Paul Samuelson has contributed his thoughts to the theory of optimal taxation, and applied the concept of tax elasticity to identify tax levels that can optimize tax revenue without impairing efficiency and economic welfare (Duarte, 2010). In his analysis, Samuelson considered how elasticities of demand and supply contribute to the response of tax subjects to tax changes. Samuelson also considered how changes in tax rates can affect government tax revenue. If the demand or supply for a good or service is relatively elastic, a change in the tax rate may have a more significant impact on tax revenue. Conversely, if demand or supply is inelastic, tax changes may have less impact on tax revenue. In addition, Samuelson also paid attention to the impact of tax elasticity on the distribution of the tax burden among different economic groups, and argued that the elasticity of demand and supply will affect the extent to which taxes can be imposed on consumers or producers. Different elasticities on various goods and services can lead to an unequal tax burden.

Samuelson's contribution in applying the concept of tax elasticity in economics helped enlighten fiscal policy analysis while providing a theoretical basis for designing a more efficient and equitable tax system. The elasticity of excise taxes to economic growth will depend largely on how sensitive excise tax revenues are to changes in economic growth. This is an important concept in the context of a country's fiscal planning and economic policy. The elasticity of excise tax to economic growth can have a significant impact on the government's fiscal revenue and also on overall economic welfare.

Positive Elasticity (Elastic Tax Revenue)

If the elasticity of excise tax to economic growth is positive, it means that tax revenue from excise taxes will increase faster than the rate of economic growth. This can happen if the goods subject to excise tax have low price elasticity (demand is less responsive to price changes) and higher income increases the consumption of these goods.

Negative Elasticity (Inelastic Tax Revenue),

If the elasticity of excise tax to economic growth is negative, this means that tax revenue from excise taxes will increase slower than economic growth. This can happen if the goods subject to excise taxes have high price elasticity (demand is highly responsive to price changes) and higher income increases reduce consumption of these goods. It is therefore important to understand the impact of excise tax elasticity on economic growth in designing effective tax and economic policies. If the government wants to increase tax revenue from excise taxes in order to support the budget and public spending, then an understanding of this elasticity will help design excise tax levels that match consumers' response to price changes. However, there are also ethical and social considerations in the application of excise taxes, especially on health-related products such as cigarettes, alcohol, and unhealthy food. Excise tax policy should consider the social impact and overall welfare of society.

Inelastic Demand Goods

If the goods subject to excise taxes have demand that is inelastic to price changes, an increase in the excise tax rate may not significantly reduce consumption of these goods. In this case, although the tax revenue from the good increases, the impact on economic growth may not be so great. Suppose consumers have a fixed preference for the excisable good and do not respond to price changes by reducing consumption. In that case, an increase in the excise tax rate may not have a large impact on consumption patterns or economic growth. If tax revenue from excisable goods is only a small share of total national income, an increase in tax revenue may not have a significant impact on overall economic growth.

Tax Management Theory

Some figures in tax management theory are: Robert W. McGee, an economist and professor at Florida International University, who is an expert on tax management and international taxation, who argues that tax management often focuses on efficiency and fairness issues in the tax system. Mc Gee (1998) argues that good tax management should aim to achieve sufficient tax revenue to finance government needs, without interfering with the economic decisions of individuals and firms. In addition, Mc Gee also highlights the importance of transparency and accountability in tax administration to reduce the potential for corruption and illegal tax evasion.

Government Expenditure Management Theory

Government spending theory is a theory used to understand the role and effects of government spending in the economy. This theory discusses government spending in various sectors and fields, including infrastructure, education, health, defense, and others. The purpose of government spending is to achieve certain economic, social, and political goals. The theory of government spending continues to evolve and involves many thinkers and economists from different schools of economic thought. Some of the luminaries of government spending management theory are John Maynard Keynes (1883-1946): A British economist who was very influential in macroeconomic theory and fiscal policy. Keynes developed the concept of government spending as one of the tools to stimulate aggregate demand and overcome the problem of unemployment in the economy (Smithies, 1951).

Paul Samuelson (1915-2009): An American economist who won the Nobel Prize in Economic Sciences in 1970. Samuelson was one of the figures who strengthened the understanding of the role of government spending in overcoming economic instability and provided theoretical support for fiscal policy. (Puttaswamaiah, 2001) Milton Friedman (1912-2006): An American economist best known for his views on free markets and monetarism, developed a critique of the influence of excessive government spending in the economy and suggested the need for austerity and prudence in public spending (Hetzel, 2007). James M. Buchanan (1919-2013): An American economist who won the Nobel Prize in Economic Sciences in 1986, developed theories about political economy and the role of government in making decisions about public spending. (Carde, et, al, 2021)

Arthur Laffer (born 1940): An American economist known for his Laffer curve showing the relationship between tax rates and tax revenues, argued for the importance of economic considerations and the impact of tax rates in government expenditure planning. (Goolsbee, et.al, 1999) Public expenditure management includes the process of planning, allocating, and utilizing government funds for various activities and projects that support government objectives. Effective management of government expenditure is essential to ensure that government funds are used appropriately, efficiently and transparently.

Some important aspects of government expenditure management include first, Budget Planning: The process of preparing a government budget for a specific period of time, usually one year, taking into account national priorities and needs, secondly, Fund Allocation: The allocation of funds to various government programs and projects based on development priorities and objectives. Third, Procurement of Goods and Services: The process of procuring goods, services and projects by the government through transparent and equitable procedures. Fourth, Expenditure Monitoring: Ensuring that government spending is carried out in accordance with planning and avoiding misappropriation of funds. The tax and expenditure management aspects of government must be carried out wisely and responsibly so that public resources can be utilized efficiently to promote public welfare and achieve the country's development goals. Transparency and accountability are also critical to effective tax and expenditure management.

Excise Theory

According to Law Number 39 Year 2007 on Excise, Excise is a state tax levied on certain goods that have properties or characteristics specified in this Law, namely (i) the need must be controlled; (ii) the circulation must be monitored; (iii) its use can cause harm to the community or the environment; or (iv) its use requires payment of State taxes for the sake of justice and balance, which tax is subject to excise under this Law.

Cnossen (1977) distinguishes the characteristics of excise from other types of taxes, namely selectivity in coverage (not all goods circulating in society can be subject to excise). This is certainly different from taxes that have general characteristics and are imposed equally on one type of tax object; discrimination in purpose; quantitative measurement (supervision of excise is more emphasized on physical supervision by the authority to ensure that excise obligations have been properly implemented). In addition to aiming to curb consumption and production, the application of excise tax on goods that are eligible for excise tax also has a social purpose, namely budget allocation through the use of goods that cannot be counted by

individuals. The imposition of excise has a direct impact on the economy in the form of price increases (Laksmana, 2008).

Fiscal policy is an important policy that regulates industrial activities. Likewise, excise policy also plays an important role in regulating certain products, which not only contributes to state revenue but on the other hand also serves as a tool to control the negative impact of the consumption of certain products.

Compared to other countries in the world, Indonesia still applies excise taxes in a limited manner, i.e. only on 3 types of goods subject to excise. Since 1995, excise only applies to tobacco products, ethyl alcohol, and beverages containing ethyl alcohol (MMEA). As time goes by, it is increasingly recognized that there are many other products besides the three Excisable Goods (BKC) whose circulation needs to be controlled because they are harmful to health and the environment. Therefore, it is necessary to add BKC. When looking at practices in other countries, the largest excise revenue in several countries in the world does not come from excise tax on tobacco products (CHT). Therefore, a good excise management is needed. Excise management itself is an administrative approach related to the collection and implementation of excise policies by government authorities. It includes the planning, implementation, and evaluation of the excise collection system. Excise management usually involves several aspects such as compliance monitoring, law enforcement, human resource empowerment, public services, and so on.

The purpose of Excise Management is to raise revenue for the government to support public expenditure and other important projects. The government may use excise policy instruments to achieve the government's objectives, such as setting tax rates at a certain level for excisable goods or services, limiting the amount of certain goods that can be produced or imported, requiring manufacturers or sellers to obtain special licenses to produce or sell excisable goods, and also requiring manufacturers to place warning labels on potentially hazardous products.

The impact of excise taxes on the overall economy is highly dependent on various factors, including the level of taxation, elasticity of demand and supply, and the efficiency of the government's use of tax revenue. If excise taxes are imposed wisely and accompanied by efficient use of revenue by the government, it can help reduce the consumption of products that are detrimental to public health, such as sugary drinks and tobacco. In addition, revenues from excise taxes can be used to finance public health or education programs that can improve people's quality of life and their productive potential. Excise taxes can affect manufacturers and industries that produce highly taxed goods. High taxes can lead to decreased sales, shrinking profit margins, and reduced production.

Economic Growth Theory

The relationship between taxes and economic growth, using different fiscal tools will have different impacts according to exogenous and endogenous (neoclassical) growth theories. Exogenous growth theorists argue that changes in tax policy do not have long-term growth effects, but only produce temporary effects (Ramsey, 1928; Solow 1970; Lee & Gordon, 2005). On the other hand, proponents of endogenous growth theory believe that changes in tax rates can have long-term growth effects and increase economic activity (Romer, 1986; Lucas, 1988; Rebelo, 1993).

Arsyad (1997, 57) argues that economic growth is a process that leads to an increase in per capita income of the people of a country over a long period of time, which is accompanied by an improvement in the institutional system. Economic growth is often measured by the growth rate of gross domestic product (GDP). Todaro and Smith (2006) explain that economic growth is a process in which the productive capacity of the economy increases over time, which has an impact on increasing production and national income.

Growth rates are also influenced by macroeconomic policies, such as taxes, consumption, and investment. A country's economic growth is determined by 5 (five) components, namely household consumption, government consumption, investment spending, exports and imports. Among these five components, the ones that can be relatively encouraged by the government in the short term are household consumption and government consumption. One of the more recent theories of economic growth is the "Endogenous Growth Theory". This theory expands the view on the sources of economic growth and focuses on internal factors that can drive economic growth in the long run.

Endogenous growth theory was first proposed by Paul Romer in 1986 and later developed by Robert Lucas, Robert Barro and several other economists. This theory emphasizes that economic growth can be influenced by human activities, such as research and development, innovation, and investment in human resources (education and skills) (Schilirò, 2019).

This approach differs from classical and neoclassical theories in that economic growth depends on external factors such as available capital and labor. Endogenous Growth Theory argues that investment in knowledge and innovation can create positive externalities, where the benefits of improved technology and knowledge are shared by society. People's understanding of excise taxes and how they can promote economic growth may vary depending on their level of economic literacy and the information they receive.

Research Groups That See a Relationship between Excise Revenue and Economic Growth

Knell et al. (1999) conducted research on the impact of government spending on productive state budgets, which then stimulated increased economic growth. This is supported by Cnossen and Smart (2005), who in their research also look at the impact of taxation on the economy, which has a broader scope than just looking at the public health approach in some ways, for example, giving more attention to the fairness aspects and administrative issues of taxation on alcohol and the relative efficiency of these taxes in raising state revenues.

An empirical study on the relationship between taxes and economic growth was also conducted by Arnold (2008), where Arnold used the analysis method conducted by Myles (2006). Arnold found that analyzing the relationship between economic growth and tax structure provides a more convincing answer than studies that only focus on the level of taxation. An increase in excise taxes on alcoholic beverages is usually regressive, especially when measured by current income, as it imposes a relatively higher tax burden on consumers of these products who generally have lower incomes than those with higher incomes (Chiou and Muehlegger 2014).

The extent to which excise taxes can be transferred to consumers will vary widely and depends on macroeconomic conditions, the structure of the relevant industry, the elasticity of demand and supply in the short and long run. However, existing empirical evidence generally supports the conclusion that taxes are largely transferred to consumers (Chiou and Muehlegger

2014). Proceeds from taxes can be used to provide security, defense, justice, social amenities, and create conditions for economic well-being for citizens (Chigbu and Njoku, 2015). Stoilova (2017) investigated the tax structure and economic growth of European countries and found that taxes on consumer goods, income taxes, and taxes on assets support a country's economic growth.

A group of researchers who see no significant relationship between excise revenue (indirect taxes) and economic growth

Excise is one of the tax instruments frequently used by governments around the world, which has the distinctive feature that the tax burden is imposed on specific goods or services, rather than on individuals or their income directly. Excise is therefore considered an indirect tax. Ilaboya and Mgbame (2012) analyzed the relationship between indirect taxes and growth in Nigeria. To this end, they used Engel-Granger cointegration model and autoregressive distribution lag (ARDL) model. They found that there is a negative but insignificant relationship between indirect taxes and economic growth in Nigeria. Umoru and Anyiwe (2013) sought to examine Nigeria's national tax policy with a particular aim of revenue generation and economic growth enhancement. They used time series data from 1975 to 2011 and employed co-integration and ECM. The results showed that only direct taxes increased growth in Nigeria, while indirect taxes had an insignificant and negative relationship with economic growth.

The conceptual landscape of product differentiation strategy is multifaceted, encompassing various elements such as new technologies, the marketing mix, competitive advantage, and value proposition. This literature review delves into the studies related to these components, providing definitions and specific explanations, and situating them within the context of contemporary market dynamics. The review synthesizes findings from existing literature to build a cohesive understanding of how differentiation strategies are implemented and their resultant impact on market performance.

Research Method

This research is a quantitative study that uses data and statistics to test hypotheses and answer research questions using Granger causality analysis conducted using time series data, where data is observed and recorded sequentially at different times. In this study, the data population used is time series data or time series data. This data population includes data observations at different points in time sequentially, namely annual time series data on excise revenue and economic growth. The sampling technique used in this study is purposive sampling of time series data to ensure that each observation in the data population has the same probability of being part of the sample used in the analysis. The type of data used in this study is secondary data. The observation period was carried out from 1998 to 2018. Starting from 1998, because before 1998 there was an economic crisis in Indonesia, so if it occurred before 1998, it would cause the impact of the economic crisis on observations. The end of 2018 was used before the COVID-19 pandemic.Thanalytical method used in this study is the Granger causality test which measures the strength of the relationship between two or more variables to determine whether an endogenous variable can be considered an exogenous variable. This is due to the lack of knowledge about the interaction between these variables. The variables to be observed are two variables, Y and X, either Y causes X, X causes Y, both are related, or there is

no relationship between the two. Variable Y causes variable X means the extent to which the value of X in the current period can be explained by the value of X in the previous period and the value of Y in the previous period. The general model of Granger causality is as follows:

$$Xt = \sum_{i=1}^{m} ai\, X_{t-1} + \sum_{j=1}^{n} bj\, Y_{t-j} + ut \quad ...(2)$$

$$Yt = \sum_{i=1}^{r} ci\, Y_{t-1} + \sum_{j=1}^{s} dj\, X_{t-j} + vt \quad ....(3)$$

Ut and Vt are errors that are assumed to have no serial correlation, and m = n = r = s.

The regression model used not only includes current independent variables but also includes past independent variables (lag and past). Such a regression model is called a distributed lag model. The equation can be written as follows:

$$Y_t = a + b_0 X_t + b_1 X_{t-1} + b_2 X_{t-2} + U_t \quad .. (4)$$

If the regression model includes one or more lagged values of the dependent variable in the independent variables, the regression model becomes an autoregressive or dynamic model, with the following equation:

$$Y_t = a + b_0 X_t + b_1 Y_{t-1} + U_t \quad (5)$$

To detect Granger causality, it can be determined by comparing the F statistic and the critical value of the F table at the confidence level (1%, 5%, or 10%) and comparing the probability value with the confidence level (1%, 5%, or 10%). If all variables have an F-statistic value greater than the F table value at a certain level of significance, then the two variables have two-way causality. Furthermore, the F-test is conducted to test the null hypothesis Ho: i = 0, i.e. X lag is not included in the regression.

$$F = \frac{(RSSr - RSSur)/m}{RSSur/(n - k)}$$

F distribution with degrees of freedom (df), where m is the number of lags in variable X and k is the number of parameters estimated in the unconstrained regression equation. RSSur is the unconstrained residual sum of squares.

Operational variables

The operational variables used in this study are as follows:

Yt   = This annual economic growth (%), is the economic development of a country characterized by increased production in the form of goods and services in society as measured by Gross Domestic Product (GDP). Gross Domestic Product (GDP) is the total value of final goods and services produced by all producers in a country's economy within a specified time and usually one year.

X1t = This year's Excise Revenue (Rp. billion), is state revenue derived from excise revenue for tobacco products (HT), beverages containing ethyl alcohol (MMEA), and ethyl alcohol (EA).

Ut = Disturbance Factor

The data collected are data on the economic growth variable (Y) which is a type of ratio data and data on the variable amount of customs revenue (X1) which is also a type of ratio data.

Result and Discussion

In order to find out whether there is a causal relationship between economic growth and Excise Revenue from 1998 to 2018, the estimation equation is tested at Lag-2 (two-year short-term approach), with the following equation:

$$Y_t = a + a_1 X1_{t-1} + b_1 Y_{t-1} + b_2 Y_{t-2} + U1_t \quad (7)$$
$$X1_t = c + d_1 X1_{t-1} + d_2 X_{t-2} + e_1 Y_{t-2} + U2_t \quad (8)$$

Equation (7) states that current economic growth (this year) is related to past economic growth and also related to the previous year's excise revenue. Similarly, equation (8) states that excise revenue is related to past excise revenue and past economic growth. There are 4 possibilities from both equations (7) and (8) to be tested, i.e. first, There is a unidirectional causality from the excise revenue variable to the economic growth variable if the lag coefficient of X1 in equation (7) is statistically significant in the group ($\sum \alpha\ i \neq 0$) and the estimated coefficient of the past economic growth variable in equation (8) is insignificant ($\sum \partial j = 0$). Second, There is a unidirectional causal relationship from the economic growth variable to the customs revenue variable if the lag coefficient of X1 in equation (7) is insignificant ($\sum \alpha\ i = 0$) and the lag coefficient of Y in equation (8) is significant ($\sum \partial j \neq 0$). Third, Reciprocal relationship or bilateral causation, if the coefficients of Y and X1 are statistically significant in both equations above. Fourth, there is no causal relationship if the coefficients of Y and X1 are insignificant in both equations above. The first test is conducted on equation (7) which will look at the impact of the previous year's Excise Revenue, and Economic Growth 1 and 2 years earlier, on current economic growth. This is to determine whether there is a causal relationship between the excise revenue variable and the economic growth variable in the equation.Top of Form

$$Y_t = a + a_1 X1_{t-1} + b_1 Y_{t-1} + b_2 Y_{t-2} + U1_t \quad (7)$$

Model-1 processing by not including variables $X1_{t-1}$ (the previous year's excise revenue variable), where the aim is to see how the impact of previous economic growth on economic growth in the following year by excluding the previous year's excise revenue.

Table. 1 Coefficient

	(Constant)	Yt_1	Yt_2
Unstandardised Coefficients	3.981	0.271	-0.021
Std Error	1.032	0.25	71
Standardised Coefficient Beta		0.481	-0.128
T	3.856	1.086	-0.288
Sig	1	0.294	0.777

The processing results show that there is no significant impact of the independent variables on the dependent variable.

Table. 2 ANOVA

	Regression	Residual	Total
Sum of Squares	1.263	7.573	8.836
df	2	16	18
Mean Square	0.632	0.473	
F	1.334		
Sig	0.291		

a. Dependent Variable: Y
b. Predictors: (Constant), Yt-2, Yt-1

The data processing results show that the squared value of the restricted residual (RSSr) is 7.573. Furthermore, model-2 processing by including all independent variables in equation (7)

Table. 3 Coefficients

	(Constant)	Yt-1	Yt-2	X1t-1
B	4.021	0.269	-0.017	-6.29E-07
Std Error	1.09	0.258	0.76	0
Standardized Coefficient Beta		0.477	-0.108	-0.044
t	3.688	1.043	-0.23	-0.169
Sig	2	0.314	0.821	0.868

Dependent Variable: Y
Predictors: (Constant), X1t-1, Yt-2, Yt-1

Table. 4 ANOVA

	Regression	Residual	Total
Sum of Squares	1.277	7.558	8.836
df	3	15	18
Mean Square	0.426	0.504	
F	0.845		
Sig	0.49		

Dependent Variable: Y
Predictors: (Constant), X1t-1, Yt-2, Yt-1

The data processing results show that the squared value of the restricted residual (RSSr) is 7.558. From the results of data processing using 2 modifications, namely model 1 and model 2, the F value is obtained as follows:

$$F = \frac{(RSSr - RSSur)/m}{RSSur/(n-k)} = \frac{(7.573 - 7.558)/1}{(7.558)/(40-3)} = \frac{0.015}{0.2043} = 0.0734$$

The F Table with m = 1 and (nk) = 37 at p = 5% is 251. Since F count < F Table, Ho cannot be rejected, which means that there is no causal relationship from the Excise Revenue Variable to the Economic Growth Variable. This finding indicates that based on model equation (7) Excise Revenue does not have a Granger causality relationship with economic growth. It is

evident that in model 1 and model 2 no independent variable significantly affects the dependent variable at a probability of p = 5%.

Customs Law No. 36 of 2007 states that the allocation of funds distribution for tobacco excise tax (DBHCHT) has been regulated, namely 50% of DBHCHT is used for the development of agriculture, industry, social environment development, socialization of excise policies, and so on. Thus it can be concluded that the allocation and utilization of the budget in these sectors still cannot maximally encourage economic growth. According to Article 66A (1) of Law Number 36 Year 2007, government revenue from tobacco tax collected in Indonesia will be distributed to provinces that impose tobacco tax at 2% to improve the quality of raw materials and encourage industrial development, improve the social environment, and socialize excise regulations to reduce or eliminate illegal goods.

Paragraph (3) stipulates that the Governor shall manage and utilize the Tobacco Tax Revenue Sharing Fund and distribute the Tobacco Tax Revenue Sharing Fund to regents/mayors in their respective regions based on their contribution to tobacco excise tax revenue. Activities that are mandated to receive an allocation of excise funds for activities that have been regulated in Law 36/2007 are still unable to make a more significant contribution to economic growth. This can be seen from the coefficient of economic growth in the previous 1-2 years which has no significant impact on current economic growth (significant values are 0.314 and 0.821, which are greater than 5% probability). Likewise, excise revenue from the previous year has not been able to have a significant impact on current customs revenue. This can be seen from the significance value that is greater than the 5% probability or 0.868. Next is the testing of equation model (8) which looks at the impact of excise revenue from the previous 1 and 2 years and economic growth from the previous 2 years on current excise revenue, with the following equation:

$$X1_t = c + d_1 X1_{t-1} + d_2 X_{t-2} + e_1 Y_{t-2} + U2_t \qquad (8)$$

Model-3 processing by not including variables Y_{t-2} (economic growth variable 2 years earlier). From the results of data processing, the following results were obtained:

Table. 5 Coefficients

	(Constant)	X1t-1	X1t-2
B	6.229868	0.854	0.194
Std Error	3037182	0.28	0.302
Standardized Coefficient Beta		0.819	0.172
t	2051	3.052	0.641
Sig	57	8	0.531

Dependent Variables: X1
Predictors: (Constant), X1t-1, X1t-2

Table. 6 ANOVA

	Regression	Residual	Total
Sum of Squares	4.52E+10	8.94E+08	4.61E+10
df	2	16	18
Mean Square	2.26E+10	55877733	

F	404.29
Sig	0

Dependent Variables: X1
Predictors: (Constant), X1t-1, X1t-2

The processing results show that the restricted residual (RSSr) squared value is 894,043,724.3. Next, we proceed with the processing of model-4 which looks at the impact of using all independent variables in equation (8). From the results of data processing, the following results were obtained:

Table. 7 Coefficients

	(Constant)	X1t-1	X1t-2	Yt-1
B	473283	0.84	0.199	1267809
Std Error	7443801	0.283	0.305	1494064
Standardized Coefficient Beta		0.806	0.177	0.031
t	0.064	2.97	0.652	0.849
Sig	0.95	0.01	0.524	0.409

Predictors: (Constant), Yt-1, X1t-2, X1t-1
Dependent Variable: X1

Table. 8 ANOVA

	(Constant)	X1t-1	X1t-2	Yt-1
B	473283	0.84	0.199	1267809
Std Error	7443801	0.283	0.305	1494064
Standardized Coefficient Beta		0.806	0.177	0.031
t	0.064	2.97	0.652	0.849
Sig	0.95	0.01	0.524	0.409

Predictors: (Constant), Yt-1, X1t-2, X1t-1
Dependent Variable: X1

The data processing results show that the squared value of the restricted residuals (RSSr) is 85,309,181. Thus the F value is as follows:

$$F = \frac{(RSSr - RSSur)/m}{RSSur/(n-k)} = \frac{(894,043,724.3 - 85,309,181.7)/1}{(85,309,181.7)/(40-3)} = \frac{808,734,542.6}{2,305653.6} = 350.8$$

The F table with m = 1 and (nk) = 37 at p = 5% is 251. Since the value of F count > F table, Ho (null hypothesis) is rejected, which means that there is a causal relationship between the economic growth variable and the excise revenue variable. From testing the two equations (7) and (8) above, it can be concluded that there is a causal relationship between excise revenue and economic growth in model-4 equation (8). The causal relationship between economic growth and excise revenue can be seen from the resulting equation as follows:

$$X1_t = 473.283 + 0.840X1_{t-1} + 0.199X_{t-2} + 1267.809Y_{t-1} + U2_t$$

Table. 9 Model Summary

Metric	Value
R	0.991
R Square	0.981
Adjusted R Square	0.978
Std Error of the Estimate	7541.4049
R Square Changes	0.981
FChange	265.051
df1	3
df2	15
Sig F change	0
Durbin Watson	1.684

The independent variables in model-4 in equation (8) together can explain the dependent variable by 97.8% with the significance of the F test of 0.000 < 5%. However, only variable X1t-1 (excise revenue variable 1 year earlier) has a positive significant impact on the dependent variable X1 (current excise revenue variable) with a coefficient of 0.840, which means that every increase in excise revenue in the previous year by Rp. 1 billion will cause an increase in excise revenue this year by Rp. 840,000,000. The impact of the previous year's economic growth on excise revenue has no significant effect.

This finding provides input to the government, especially the Ministry of Finance, that the previous year's excise revenue achievement indicator can be an indicator of the next year's excise revenue achievement. Therefore, the previous year's decline in excise revenue needs to be addressed with various strategies and breakthroughs as well as innovations to increase the achievement of excise revenue the following year, such as adjustments to excise tariff policies, excise incentives for excisable goods (BKC) entrepreneurs so that they can increase their BKC production. The target of increasing excise revenue in 2022, which the government has announced through the addition of one BKC product, namely plastic, needs to be accompanied by adjustments to the excise tariff policy, considering that this year's excise revenue (in 2023) will depend heavily on the previous year's excise revenue. According to the Aggregate Output theory, taxes can also harm GDP and economic growth if not managed properly. This can occur especially if taxes are applied inefficiently or inappropriately, the impact of which can vary depending on the type of tax, the amount of tax, and how the tax revenue is used.

Table. 10 Excise Revenue Elasticity Categories According to Bunescu (2013)

Category	Elasticity Type	Effect
Eff/Y = ∞	Perfect Elasticity Tax Revenue	A small (minimum) change in economic growth will result in a large (maximum) change in tax revenue.
Eff/Y > 1	Elastic Tax Revenue	Changes in economic growth will result in larger (more than proportional) changes in tax revenue.
Eff/Y = 1	Elastic Unitary Tax Revenue	A 1% change in economic growth will result in a 1% change in tax revenue.
Eff/Y < 1	Inelastic Tax Revenue	Changes in economic growth will result in small (less than proportional) changes in tax revenue.
Eff/Y = 0	Perfect Elasticity Tax Revenue	A very large (maximum) change in economic growth will have no impact on changes in tax revenue.

Excise revenue is necessary for government revenue sources, which are used to finance public services and essential programs such as education, health, and infrastructure. Therefore, the wise and efficient design and management of excise revenue is crucial to achieve a balance between government revenue and sustainable economic growth. A well-designed and transparently managed excise tax management plan can mitigate its negative impact on GDP and economic growth while meeting the government's fiscal needs. Judging from the endogenous growth model developed by Barro (1990), the allocation of Excise Revenue is often biased towards less productive expenditure items in the government budget, hence the often negative impact. On the other hand, if Excise Revenue can be utilized for productive government spending, it is expected to have a positive impact on economic growth.

Excise Revenue is one of the important sources of revenue for the Indonesian government, to achieve the country's economic, social, and infrastructure development goals. The Excise Revenue budget must therefore be managed prudently and transparently to maximize benefits to society and economic growth. The excise revenue allocation program to productive sectors aims to support and encourage sustainable and productive economic growth. Excise revenue that is wisely allocated to sectors that have growth potential can have a positive impact on economic development and job creation.

The allocation of excise revenue can be directed primarily towards responding to negative externalities associated with the consumption or production of a good or service. Negative externalities refer to adverse side effects or impacts that arise from the consumption or production of a good or service, which are not reflected in the private costs or benefits of the individuals or firms involved in the transaction. Therefore, it is very important for the health sector to get the budget allocation, especially for, first, Improving Access to Health Services to expand people's access to quality health services. This may include constructing and maintaining health facilities, building hospitals and clinics' capacity, and expanding public health programs.

Second, to improve the quality of available health services. This may include procurement of medical equipment, training of medical personnel, and improvement of health infrastructure. Third, for infectious disease prevention and control programs, such as vaccinations and epidemiological surveillance. In addition, funds can be used for community education on healthy lifestyles to reduce the risk of non-communicable diseases such as diabetes, cardiovascular disease, and cancer. Fourth, to ensure the availability of affordable medicines and effective medical treatments. This helps people gain access to the care they need without having to face significant financial barriers. Fifth, to support public health programs, such as immunization, maternal and child care, and reproductive health programs. This contributes to the overall improvement of public health. Sixth, to help reduce the financial burden borne by people when they need medical treatment. This will help maintain household economic stability.

Seventh, to reduce pressure on the government budget in financing the health sector. The government can allocate additional funds to other sectors or to other social programs. Eighth, to help improve the overall public health index. This is to create a healthier, more productive and competitive society, which in turn can support economic growth. In this way, the allocation of excise revenue to the health sector can have a significant positive impact on people's welfare and the country's economic growth. In addition, excise revenue can also be directed to

productive sectors such as First, by providing financial support to SMEs which are an important pillar in the economy, by providing low-interest loans, training, technical assistance, and market access for SMEs. Second, investing in education and skills training that can improve labor competitiveness. Third, utilize excise revenue for agricultural infrastructure, agricultural technology upgrades, and support to farmers.

Fourth, encourage the growth of manufacturing industries that can increase added value in the economy, by allocating tax incentives or credits for manufacturing companies, improving industrial infrastructure, and developing industrial clusters. Fifth, invest in research and development to spur innovation in various sectors of the economy. Excise revenue can be used to support research and development projects that are relevant to the needs of the economy. Sixth, support the clean energy sector and environmental protection that can lead to sustainable growth of economic sectors, through the allocation of excise revenue for renewable energy development, incentives for green technology, and environmental projects.

Seventh, support the tourism sector and creative industries that can contribute greatly to economic growth, through the allocation of excise revenue to promote tourism, support artists and creative enterprises, and build tourism infrastructure. Eighth, invest in transportation and logistics infrastructure to improve connectivity and facilitate the movement of goods and services, through the allocation of excise revenue to finance these infrastructure projects. Ninth, support the Information and Communication Technology (ICT) sector through the allocation of excise revenue to support ICT development, digital inclusion, and ICT training. Excise revenue allocation programs to productive sectors should be based on an analysis of economic needs and national development goals. It is important to ensure transparency, accountability, and good oversight in the use of these funds in order to achieve the expected positive impact on economic growth.

Conclusion

Only model-4 in equation (8) the independent variables together can explain the dependent variable by 97.8% with an F test significance of 0.000 < 5%. However, only variable $X1t-1$ (excise revenue variable 1 year earlier - lag-1) individually has a positive significant impact on the dependent variable X1 (current excise revenue variable). The impact of the previous year's economic growth on excise revenue has no significant effect. Elasticity values < 1 occurred in 1999, 2000, 2001, 2006, 2008, 2009, 2011, 2012, 2013, 2014, and 2015, meaning that in those years changes in economic growth had little impact on excise revenue. Elasticity values <1 account for 61.1% of the 18 years of observation. Meanwhile, elasticity values > 1 occurred in 2002, 2003, 2004, 2005, 2007, 2017, and 2018, meaning that changes in economic growth led to larger changes in excise revenue. The portion of elasticity value > 1 from 18 years of observation has a value of 38.9%.

Based on the results of existing research, the excise allocation does not have a significant impact because it falls on less productive government expenditure items. When excise revenue is used for productive government spending, it is expected to have a positive impact on economic growth. The existing excise revenue distribution approach needs to be carefully

evaluated and targeted at productive sectors in order to have a significant impact on increasing excise revenue and economic growth.

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