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Article

Local government development policy: Natural resource revenue sharing and economic growth in Indonesia

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Abstract: Regions rich in natural resources often exhibit a high dependency on revenue from Revenue Sharing Funds (DBH). This dependency can pose long-term challenges, especially when commodity prices experience significant fluctuations. This study examines the role of Revenue Sharing Funds from Natural Resources (DBH SDA) on economic growth in 491 regencies/cities in Indonesia during the 2010–2012 period. The analysis employs panel data regression. The selection of this period was based on the occurrence of a resource boom characterized by a surge in global demand for natural resource commodities, accompanied by an increase in commodity prices. This condition positively impacted the revenues of both the nation and resource-rich regions. The results of the study show that economic growth is not influenced by DBH SDA but rather by General Allocation Funds (DAU). This indicates that the central government still plays a significant role in determining economic growth at the regency/city level in Indonesia. Regions need to prioritize economic diversification to reduce reliance on DBH SDA and DAU. Investment in productive sectors, such as infrastructure, education, and technology, can be a strategic approach to accelerating regional economic growth.

Keywords: natural resources; economic growth; revenue sharing fund; development; panel data regression

1. Introduction

Natural resource wealth in Indonesia has the potential to support economic development, but its impact on economic welfare is complex. Natural resources such as petroleum, natural gas, minerals, and forest products are high-value commodities and can serve as a source of revenue for the state (Maharani and Akbar, 2023). Within the framework of equity and improving public welfare, the government implements the Revenue Sharing Fund for Natural Resources (DBH SDA) policy. This policy aims to distribute income from the natural resource sector to producing regions so that these regions can utilize the funds to strengthen the local economy, enhance infrastructure, education, and healthcare services.

Natural resource offers may contribute to short-term economic growth; however, their long-term benefits remain unclear. The DBH SDA seeks to allocate revenue to developing regions; however, its contribution to infrastructure expenditure is restricted (Hidayat et al., 2024; Shi et al., 2017). Enhancing institutional quality, particularly through enforcing environmental laws, and enhancing industry value-added are essential for generating a multiplier effect from resource rents. Furthermore, the influence of DBH SDA on economic growth, unemployment, and poverty alleviation differs by region (Hidayat et al., 2021; Majid et al., 2020). Indonesia ought to promote institutional quality, revenue-sharing regulations to benefit communities nearby to resource extraction areas, thereby optimizing the advantages of natural resources (Anggraeni et al., 2020).

The DBH SDA is expected to serve as a fiscal policy instrument supporting regional development. However, field realities reveal varying outcomes across regions. Some regions receiving significant DBH SDA allocations still face high poverty and inequality levels, while the impact on economic growth is not always significant. This raises questions about the effectiveness of DBH SDA in promoting economic growth at the district and municipal levels in Indonesia. Many resource-producing regions receive substantial DBH SDA funds, yet the management of these funds is often ineffective. Budgets are frequently not allocated to sectors that drive sustainable economic growth, resulting in limited economic impacts. The exploitation of natural resources in a region can be carried out based on the concept of regional autonomy. In practice, however, not all local governments can effectively utilize the natural resources within their territories (Faturohim et al., 2024; Yasa, 2021).

Resource-producing regions often tend to rely heavily on DBH revenue, which can lead to long-term issues when commodity prices fluctuate. This dependency can hinder economic diversification and reduce local economic resilience. The distribution of DBH SDA can exacerbate regional inequalities, as resource-producing regions receive more funds than non-producing regions. This has the potential to create economic disparities between regions, which may disrupt social stability. Revenue-sharing funds from taxes and natural resources have, in fact, widened the income distribution gap between regions in Indonesia (Mudayen and Maridjo, 2018).

Several studies indicate that increased DBH SDA revenues do not always correlate with higher economic growth. This may be due to the misallocation of DBH funds or the limited capacity of local governments to manage these funds productively. The aim of this research is to analyze the impact of DBH SDA on economic growth in Indonesia. The management of DBH SDA still faces issues of transparency and accountability, which can lead to fund misuse. Without proper governance, the potential of DBH SDA to enhance regional economic development cannot be fully realized.

2. Materials and methods

This study uses secondary data in the form of local government revenue and expenditure collected from official institutions such as the Ministry of Finance, the Ministry of Public Works, and the Central Statistics Agency. Government expenditure in the education sector per capita, ZEDUCKap, represents the total regional

government spending on education across 491 districts/cities in Indonesia, adjusted for constant prices, divided by the population of each respective district/city. This value is expressed in logarithmic form. The expenditure data is sourced from the Central Statistics Agency of the Republic of Indonesia.

Government spending in the health sector per capita, ZHEALTHKap, reflects the amount of government expenditure for healthcare in 491 regencies/cities across Indonesia, calculated based on constant prices and divided by the population of each region. This value is then expressed in logarithmic form to facilitate analysis and comparison. The data is sourced from the Central Statistics Agency of the Republic of Indonesia, which provides a clear picture of health budget allocation across various regions in Indonesia.

Government spending on infrastructure per capita, or ZINFRAKap, represents the total expenditure by local governments on infrastructure in 491 regencies/cities across Indonesia. This figure is calculated based on constant prices and divided by the population of each region, then expressed in logarithmic form to facilitate analysis and comparison. The data is sourced from the Central Statistics Agency of the Republic of Indonesia, providing insights into the distribution of infrastructure funding across various regions in Indonesia.

The data includes annual time-series data for the period 2010 to 2012, as well as cross-sectional (panel) data covering 491 districts and cities across Indonesia. This approach enables a comprehensive understanding of DBH SDA dynamics in various regions, particularly in relation to the economic growth of resource-producing areas. The selection of the 2010–2012 period is based on the global natural resource boom during this timeframe. This period saw a surge in global demand for various natural resource commodities, leading to a significant increase in commodity prices. This boom provided an opportunity for resource-producing countries, including Indonesia, to benefit from increased revenues. The impact of this resource boom is expected to be reflected in the DBH SDA revenue levels for districts and cities in Indonesia.

The selected period is relevant for evaluating the effectiveness of DBH SDA in driving regional economic growth. This research aims to provide a comprehensive overview of how revenues from the natural resource sector, channeled through DBH, can be utilized by local governments to support economic development. The findings of this analysis are also expected to offer insights for more effective and sustainable DBH SDA management policies, particularly in improving welfare and economic growth at the local level.

The model employed in this study is designed to analyze the relationship between DBH SDA and economic growth at the district and municipal levels. By using panel data that includes DBH SDA variables, economic growth, and other control variables, the model aims to identify both the direct and indirect effects of DBH SDA on regional economic dynamics. The panel data approach allows for a deeper analysis by observing variations across time and regions, providing a more accurate depiction of the relationship patterns across different areas. Econometrically, these relationship patterns can be expressed as:

$$\text{LogYKap}_{it} = \theta_0 + \theta_1\text{LogDBH SDAKap}_{it} + \theta_2\text{LogZEDUCKap}_{it} + \theta_3\text{LogZHEALTHKap}_{it} + \theta_4\text{LogZINFRAKap}_{it} + \theta_5\text{LogDAUKap}_{it} + \theta_6\text{LogDAKKap}_{it} + \theta_7\text{LogPADKap}_{it} + \theta_8\text{LogPDRBKap}_{it} + \varepsilon_{it}$$

where is:

LogYKap	= Log Economic Growth per capita
LogDBH SDAKap	= Log Natural Resource Revenue Sharing per capita
LogZEDUCKap	= Log Local Government Education Spending per capita
LogZHEALTHKap	= Log Local Government Health Spending per capita
LogZINFRAKap	= Log Local Government Infrastructure Spending per capita
LogDAUKap	= Log General Allocation Fund per capita
LogDAKKap	= Log Special Allocation Fund per capita
LogPADKap	= Log Local Own-Source Revenue per capita
LogPDRBKap	= Log Gross Domestic Regional Product/GDRP per capita
θ_0	= Constanta
$\theta_1 ... \theta_8$	= Paramater Value of Variables
i	= Regency/City
t	= 2010–2012
ε	= Error term

This model is expected to reveal the extent to which DBH SDA contributes to regional economic growth. The model also takes into account other factors influencing economic growth, such as infrastructure, human resource quality, and the level of investment in each region. Thus, the results of the analysis from this model are expected to provide important information on the effectiveness of DBH SDA in promoting regional economic development and offer guidance to the government in designing fiscal policies that are more responsive to the needs and potentials of each region.

3. Results and discussion

This study covers 491 districts and cities in Indonesia, grouped into six island regions based on three natural landscapes: the Sunda Shelf (including Sumatra, Java, Bali, and Kalimantan), the Sahul Shelf (Maluku and Papua), and the Transitional Region (Sulawesi and Nusa Tenggara). This grouping is based on factors such as biophysical conditions, natural resources, human resources, and mutually supportive cultural interactions. This regional division established geographical proximity and shared characteristics to promote equitable economic and social development across all regions (Hidayat et al., 2024).

Figure 1 shows a trend of increasing average revenue for local governments in 491 districts and cities in Indonesia sourced from DBH SDA. This increase is accompanied by a rise in the average Gross Regional Domestic Product (GRDP) per capita during the same period.

	2010	2011	2012
Avg DBH SDA_Kap	495.396	498.615	504.991
Avg GRDP_Kap	28.767.042	29.021.047	29.321.732

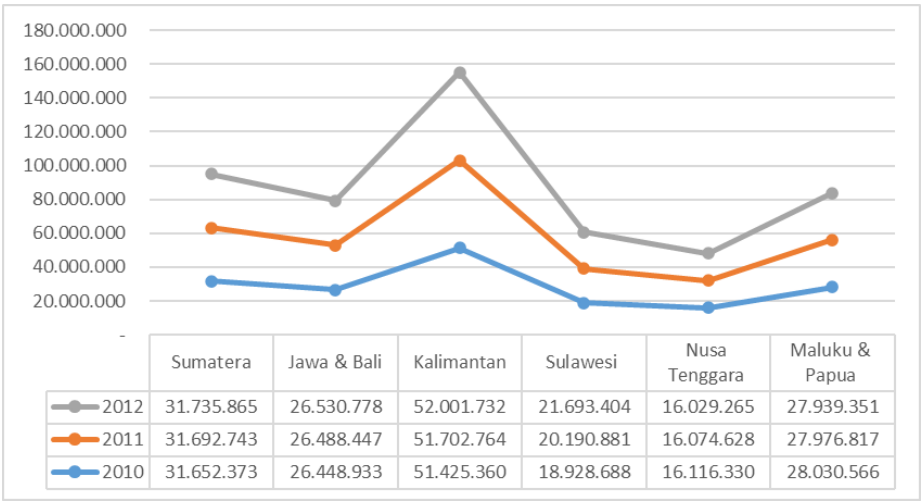
Figure 1. Average trends in DBH_SDA and GRDP per capita of 491 regency/city in Indonesia (IDR/Person).

Source: Processed from regional financial statistics, ministry of finance of the republic of Indonesia, 2024.

Nominally, the average DBH SDA at the beginning of the period was recorded at IDR 495,396 per capita, which then increased to IDR 504,991 per capita at the end of the period, representing an increase of 1.94 percent. Similarly, the average GRDP per capita rose from IDR 28,767,042 per capita per year to IDR 29,321,732 per capita per year during this period, reflecting an increase of 1.93 percent.

This upward trend indicates a positive relationship between the increase in DBH SDA and GRDP per capita in regions receiving revenue-sharing funds.

As shown in **Figure 2**, regency and city governments in the Sumatra region are the largest recipients of DBH SDA per capita, with an increase from an average of IDR 591,525 to IDR 700,669. A similar trend is observed among regency and city governments in the Maluku and Papua, Kalimantan, Java and Bali, and Sulawesi regions. Meanwhile, regency and city governments in the Nusa Tenggara region receive the lowest DBH SDA per capita, with an average of IDR 51,190, which decreased further to IDR 24,466.



	Sumatera	Jawa & Bali	Kalimantan	Sulawesi	Nusa Tenggara	Maluku & Papua
2012	31.735.865	26.530.778	52.001.732	21.693.404	16.029.265	27.939.351
2011	31.692.743	26.488.447	51.702.764	20.190.881	16.074.628	27.976.817
2010	31.652.373	26.448.933	51.425.360	18.928.688	16.116.330	28.030.566

Figure 2. Average GRDP per capita by island/region in Indonesia (IDR/Person).

Source: Processed from regional financial statistics, ministry of finance of the republic of Indonesia, 2024.

Examining the revenue of regency and city governments from DBH SDA alongside the expenditures allocated for infrastructure spending in each region reveals an interdependent relationship between DBH SDA receipts and local government allocation for the infrastructure sector. This positive trend illustrates the behavior of local government officials, where increases in DBH SDA receipts are met with corresponding increases in investment spending on infrastructure.

Furthermore, as shown in **Figure 3**, the regional economic development reflects that the average economic growth rate of district and municipal governments in the Sulawesi region during the period from 2003 to 2013 was 7.11 percent, the highest compared to the national average economic growth rate of 4.38 percent during the same period. Similarly, district and municipal governments in the Java and Bali regions recorded an average growth rate of 5.73 percent, while those in the Sumatra region averaged 3.27 percent, the Maluku and Papua regions 3.69 percent, and the Nusa Tenggara region 3.81 percent. On the other hand, district and municipal governments in the Kalimantan region had the lowest average economic growth rate, at only 2.65 percent.

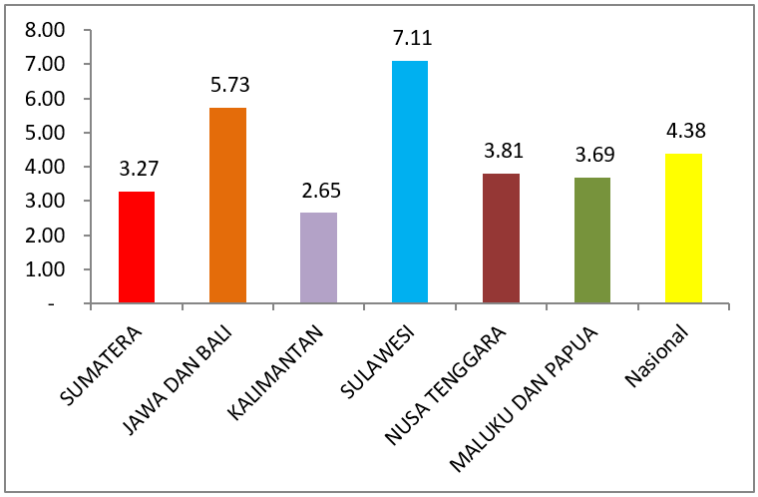


Figure 3. Economic growth rate (LPE) of regency and city in Indonesia by region average year 2003–2013 (in percent).
Source: Processed from BPS, 2024.

The relationship between natural resource abundance and economic growth suggests that countries or regions rich in natural resources should, in theory, exhibit relatively better economic performance compared to those with limited resources. According to Wright and Czelusta (2004), the economic success of the United States surpassing that of Britain in the 18th century was due to the United States having a greater abundance of natural resources compared to Britain. The United States, along with Canada, Australia, and the Scandinavian countries, are examples of nations that have successfully transformed their natural resource wealth into prosperity and economic growth through sustainable resource management, supported by technological advancements and institutional quality improvement.

3.1. Regression equation

The following are the results of panel regression calculations using the help of the Eviews 9 program.

The panel data regression results, from **Table 1**, are explained by the following equation:

Table 1. Model estimation results of economic growth per capita.

Variable	Coefficient	Std. Error	*z*-Statistic	Prob.
C	1.67	0.51	3.31	0.00
LOGDBHSDAKAP	−0.001	0.02	−0.06	0.10
LOGZEDUCKAP	−0.01	0.10	−0.12	0.91
LOGZHEALTHKAP	−0.11	0.10	−1.17	0.24
LOGZINFRAKAP	0.02	0.05	0.38	0.70
LOGDAUKAP	0.14**	0.06	2.20	0.03
LOGDAKKAP	−0.06	0.05	−1.25	0.21
LOGPADKAP	0.04	0.06	0.59	0.56
LOGPDRBKAP	−0.04	0.06	−0.66	0.51

Source: Data processing results, 2024.
* Signficant at 10%, ** Signficant at 5%,10%, *** Signficant at 1%,5%,10%.

$$\text{LogYKap} = 1.67 - 0.001\ \text{LogDBH SDAKap} - 0.01\ \text{LogZEDUCKap} - 0.11\ \text{LogZHEALTHKap} + 0.02\ \text{LogZINFRAKap} + 0.14\ \text{LogDAUKap} - 0.06\ \text{LogDAKKap} + 0.04\ \text{LogPADKap} - 0.04\ \text{LogPDRBKap}$$

3.2. Statistical hypothesis testing

3.2.1. *f*-test

In panel data analysis, there are three main models used:

1) Common Effect Model (Pooled Least Squares): Assumes that there are no differences between individuals or over time. This model combines all data without considering the panel structure.
2) Fixed Effect Model (FE): Assumes that there are unique characteristics among individuals (or entities) that are constant over time.
3) Random Effect Model (RE): Assumes that the differences among individuals are random and not correlated with the independent variables.

To determine the most appropriate model, the following tests are conducted:

a) Chow Test (Fixed Effect vs. Common Effect): Tests whether the fixed effect model is better than the common effect model. If the *p*-value < 0.05, the fixed effect model is chosen.

Based on **Table 2**, the analysis reveals that the regression equation favors the Fixed Effect (FE) model, as indicated by a Chi-square significance value (*p*-value) below 0.05. Consequently, the next step involves conducting a Hausman test to confirm the suitability of the Fixed Effect (FE) model identified in the Chow test.

Table 2. Chow test results for per capita economic growth model.

Effects Test	Statistic	d.f.	Prob.
Cross-section *F*	1.44672***	(481,703)	0.0000
Cross-section Chi-square	820.861493***	481	0.0000

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

b) Hausman Test (Fixed Effect vs. Random Effect): This test evaluates whether the Random Effect model offers a better fit compared to the Fixed Effect model. If the *p*-value is less than 0.05, the Fixed Effect model is deemed more appropriate. Conversely, if the *p*-value exceeds 0.05, the Random Effect model is considered the better choice.

The test results indicate that the model is best analyzed using the Random Effect approach, as evidenced by a Chi-square *p*-value exceeding 0.05.

After a series of tests, the most appropriate model for panel data regression analysis in this study is the Random Effect model. The selection of this model is based on the test results, which show that the Random Effect model provides more optimal results for the data used. **Table 3** presents the results of the simultaneous test conducted using the Random Effect model, which shows the combined effect of the independent variables on the dependent variable in this study.

Table 3. Hausman test results for per capita economic growth model.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	1.44672***	(481,703)	0.0000
Cross-section Chi-square	820.861493***	481	0.0000

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

Based on **Table 4**, it is found that the prob. value (Rn-squared stat) is 0.584 > 0.05; thus, H_0 is accepted, which means that DBH SDAKap, ZEDUCKap, ZHEALTHKap, ZINFRAKap, DAUKap, DAKKap, PADKap, and PDRBKap together explain YKap, but the model is not significant, or in other words, the model formed is not fit.

Table 4. Results of simultaneous effect of infrastructure expenditure model per capita.

R-squared	0.003	Adjusted *R*-squared	−0.004
Rw-squared	0.008	Adjust Rw-squared	0.008
Akaike info criterion	1937.948	Schwarz criterion	1986.199
Deviance	375.8717	Scale	0.442
Rn-squared statistic	6.568446	Prob (Rn-squared stat.)	0.584

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

3.2.2. *T*-test

Partial testing aims to evaluate the effect of each independent variable on the dependent variable in the regression model to assess whether the effect is significant.

The decision-making in partial tests is based on the probability value (*p*-value) with the following criteria: if the *p*-value < 0.05 at a 5% significance level, then H_0 is rejected. This indicates that the independent variable has a significant partial effect on the dependent variable. Conversely, if the *p*-value > 0.05, H_0 is accepted, showing that the independent variable does not have a significant partial effect on the dependent variable. Below are the results of the partial tests obtained from the Random Effect model:

Based on **Table 5**, the following conclusions can be drawn:

Table 5. Results of partial effect of per capita economic growth

Variable	Coefficient	Std. Error	*z*-Statistic	Prob.
C	1.670175	0.504924	3.307772	0.0009
LOGDBHSDAKAP	−0.001009	0.01683	−0.059926	0.9522
LOGZEDUCKAP	−0.011175	0.097422	−0.114703	0.9087
LOGZHEALTHKAP	−0.112781	0.096288	−1.171297	0.2415
LOGZINFRAKAP	0.017407	0.04533	0.38401	0.7010
LOGDAUKAP	0.140937**	0.063957	2.203629	0.0276
LOGDAKKAP	−0.062371	0.049829	−1.251698	0.2107
LOGPADKAP	0.035528	0.060014	0.591993	0.5539
LOGPDRBKAP	−0.040424	0.06162	−0.656022	0.5118

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

1) DBH SDAKap Variable

The *p*-value of the DBH SDAKap variable is 0.9522, with a negative influence direction. Therefore, H_0 is accepted, and it can be concluded that the DBH SDAKap variable does not have a significant partial effect on YKap with a negative influence.

2) ZEDUCKap Variable

The *p*-value of the ZEDUCKap variable is 0.9087, with a negative influence direction. Therefore, H_0 is accepted, and it can be concluded that the ZEDUCKap variable does not have a significant partial effect on YKap with a negative influence.

3) ZHEALTHKap Variable

The *p*-value of the ZHEALTHKap variable is 0.2415, with a negative influence direction. Therefore, H_0 is accepted, and it can be concluded that the ZHEALTHKap variable does not have a significant partial effect on YKap with a negative influence.

4) ZINFRAKap Variable

The *p*-value of the ZINFRAKap variable is 0.7010, with a positive influence direction. Therefore, H_0 is accepted, and it can be concluded that the ZINFRAKap variable does not have a significant partial effect on YKap with a positive influence.

5) DAUKap Variable

The *p*-value of the DAUKap variable is 0.0276, with a positive influence direction. Therefore, H_0 is rejected, and it can be concluded that the DAUKap variable has a significant partial effect on YKap with a positive influence.

6) DAKKap Variable

The *p*-value of the DAKKap variable is 0.2107, with a negative influence direction. Therefore, H_0 is accepted, and it can be concluded that the DAKKap variable does not have a significant partial effect on YKap with a negative influence.

7) PADKap Variable

The *p*-value of the PADKap variable is 0.5539, with a negative influence direction. Therefore, H_0 is accepted, and it can be concluded that the PADKap variable does not have a significant partial effect on YKap with a negative influence.

8) PDRBKap Variable

The *p*-value of the PDRBKap variable is 0.5118, with a negative influence direction. Therefore, H_0 is accepted, and it can be concluded that the PDRBKap variable does not have a significant partial effect on YKap with a negative influence.

3.2.3. Classical assumption test

One way to test for the presence of multicollinearity is by using a correlation test. In this test, the correlation between one variable and another will be examined. Additionally, the Variance Inflation Factor (VIF) values for each predictor variable should be checked. Multicollinearity occurs when the VIF value for a variable exceeds 10.

Table 6. Results of multicollinearity test.

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.877526	1100.206	NA
LOGDBHSDAKAP	0.000975	26.45965	1.200254
LOGZEDUCKAP	0.032668	1422.111	2.331781
LOGZHEALTHKAP	0.031912	1144.074	3.924187
LOGZINFRAKAP	0.007073	266.5032	2.120086
LOGDAUKAP	0.014079	664.3796	4.313037
LOGDAKKAP	0.008546	284.1047	3.710748
LOGPADKAP	0.012397	403.2736	1.694246
LOGPDRBKAP	0.013069	752.1300	1.278884

Source: Processed secondary data, 2024

Based on these criteria in **Table 6**, the model used in this study passes the multicollinearity assumption. This result is supported by the Variance Inflation Factor (VIF) values being less than 10, indicating that no multicollinearity issue exists in the model. The heteroscedasticity test used in this study is the Glejser test. The results of this test are as follows.

Table 7. Results of heteroscedasticity test.

F-statistic	3.83877***	Prob. F(5,1202)	0.0002
Obs*R-squared	30.1613***	Prob. Chi-Square(5)	0.0002
Scaled explained SS	52.6592***	Prob. Chi-Square(5)	0.0000

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

Based on these criteria in **Table 7**, the model used in this study does not pass the heteroscedasticity assumption. The Prob supports this result. The chi-square value of 0.0002, which is less than 0.05, indicates that the model has a heteroscedasticity issue. To address this issue, estimation is performed using Robust standard errors.

The autocorrelation test used in this study is the Breusch-Godfrey Serial Correlation LM Test. Autocorrelation typically occurs in time series data, and the consequence of autocorrelation in a regression model is that the interpretation is inefficient, and standard *t*-tests and *F*-tests may not be valid, even though the estimation remains unbiased. The results of the autocorrelation test using the Breusch-Godfrey Serial Correlation LM Test are shown in **Table 8** below.

Table 8. Results of autocorrelation test

F-statistic	7.09059***	Prob. F(2,1200)	0.0009
Obs*R-squared	14.1435***	Prob. Chi-Square(2)	0.0008

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

Based on these criteria, the model used in this study passes the autocorrelation assumption. This result is supported by the Prob. Chi-Square value of 0.0008, which is smaller than 0.05, indicating that there is an autocorrelation issue in the model. To address this issue, estimation is performed using Robust standard errors. In this study, linearity testing is conducted using the Ramsey Test, with the following results.

Based on the **Table 9**, it can be seen that the model does not satisfy the linearity assumption. This is because the prob F-statistic value in the model is less than 0.05 (< 0.05).

Table 9. Results of linearity test.

	Value	**df**	**Probability**
t-statistic	2.489010**	1203	0.0129
F-statistic	6.195170**	(1, 1203)	0.0129
Likelihood ratio	6.231237**	1	0.0126

* Significant at 10%, ** Significant at 5%,10%, *** Significant at 1%,5%,10%.
Source: Processed secondary data, 2024.

4. Discussion

In this study model, the role of DBH SDAKap does not significantly affect economic growth, with a coefficient value of −0.001. To expand the analysis of why the Revenue Sharing Fund for Natural Resources (DBH SDA) does not have a significant impact on economic growth, we can consider the following in-depth aspects. For example, natural resource-rich regions, such as Papua, have a large flow of natural resource revenue sharing, but non-mining sectors, such as manufacturing or services, are underdeveloped so that the economy remains dependent on the global commodity price cycle. Regions that depend on natural resource exploitation often face the risk of low economic diversification. As a result, revenue from DBH SDA is not optimized for productive sectors that drive long-term growth. Many local governments use DBH SDA for routine expenditures, such as employee salaries, rather

than investment in infrastructure or education. This reduces the potential multiplier effect that should support economic growth. Revenue from DBH SDA is often affected by volatility in global commodity prices, such as oil or coal. This uncertainty makes budget allocations less stable and difficult to plan to promote long-term growth. DBH SDA is often concentrated in a few producing regions, while non-producing regions that also need infrastructure or basic services do not benefit adequately. This inequality slows down national economic growth. Some regions do not have the technical or managerial capacity to optimally manage DBH SDA. Without proper planning, this budget is unlikely to have a significant impact on long-term development.

Kolstad and Wiig (2009) emphasize that the effectiveness of institutions plays a crucial role in determining whether resource wealth leads to economic growth or contributes to stagnation. They argue that weak institutions can exacerbate the negative effects of resource dependence. Natural resource wealth often fails to translate into better economic performance due to various challenges, including macroeconomic volatility, particularly in fiscal policy, and the "Dutch disease" effect, which can crowd out manufacturing (Bleaney and Halland, 2014; Frankel, 2012; Wong, 2021). Poor institutions and governance are also significant factors. Resource-rich countries face price volatility in global markets, which can hinder long-term growth. To address these issues, countries have attempted diversification strategies with varying success (Suslova and Volchova, 2012). Improving institutions remains a key challenge. Policymakers are advised to insulate fiscal policy from oil price volatility and focus on using resource revenues to foster better development outcomes. While the long-term trend in commodity prices may not be downward, the other challenges contribute significantly to the "resource curse" phenomenon (Frankel, 2012; Wang et al., 2022; Yao et al., 2019).

Additionally, it turns out that only DAU per capita plays a significant role and positively affects per capita economic growth, with a coefficient value of 0.14. AU is a block grant transfer from the central government to the regions, meaning that its use is more flexible than the Special Allocation Fund (DAK) or Revenue Sharing Fund (DBH). Regions can adjust their budget allocations according to their development priorities, such as education, health, or infrastructure. This flexibility allows regions to respond to local needs more quickly and effectively, resulting in an immediate impact on economic growth. The DAU calculation mechanism takes into account regional needs and fiscal capacity. Regions with low fiscal capacity receive a larger portion of DAU to reduce fiscal disparities between regions. This ensures equitable development and encourages economic activity, especially in underdeveloped or resource-constrained regions.

In contrast, government spending on education does not have a significant effect. In this case, it can be understood that education spending does not burden economic growth. Furthermore, spending on health and infrastructure also does not significantly impact economic growth. This aligns with the role of health and infrastructure sectors as investments whose results may not be immediately felt. The relationship between government spending on education, health, and infrastructure and economic growth shows mixed results across studies. While education spending was found to impact economic growth in some cases positively, others found no significant effect (Astuti and Lestari, 2020; Sunardi et al., 2022). In one study, health spending positively

influenced human development and welfare but showed no significant effects on economic growth in others (Effendy et al., 2023; Erlyn et al., 2021). Infrastructure spending yielded conflicting results, with one study reporting a negative impact on economic growth and another finding no significant effect (Hidayat et al. 2022; Sasongko and Wibowo, 2022). These inconsistencies suggest that the relationship between government spending and economic growth is complex and may depend on various factors, including each study's specific context and timeframe. However, DAKKap, PADKap, and PDRBKap also do not significantly affect economic growth.

Research shows that different types of fund transfers have different effects on economic growth in the regions. Sengaji et al. (2019) found that Regional Original Revenue (PAD) positively impacts on economic growth. Meanwhile, Rawung et al. (2023) it was found that the Special Allocation Fund (DAK) had a negative impact on economic growth in North Sulawesi Province, while PAD and the General Allocation Fund (DAU) showed no significant effect. In North Sumatra, the results of Pertiwi et al. (2022) showed that DAK had a significant negative impact on economic growth, while PAD and DAU had a significant positive effect.

In contrast, PAD and DAU significantly affected economic growth in Bima City, but DAK had no effect. In addition, this study also concluded that the government's flypaper effect tends to rely more on central fund transfers than local own-source revenues did not occur in Bima City. The impact of transfer funds on economic growth may vary across regions depending on the local context and how they are managed. These studies also explored the relationship between these financial instruments and other factors such as poverty and unemployment, with mixed results.

In another study it was said that the Revenue Sharing Fund (DBH) support regional economic growth through budget allocation to strategic sectors such as education, health, and infrastructure (Erlyn et al., 2022; Ramey, 2021; Sasongko and Wibowo, 2022). However, its effectiveness is depending heavily on the quality of institutions and good fiscal governance (Arvin et al., 2021). Similar to remittances, fiscal transfers like DBH have the potential to reduce poverty if utilized optimally (Abduvaliev and Bustillo, 2020; Faturohim et al., 2023; Saksono et al., 2022).

Likewise with research Dinh Thanh et al. (2020) revealed that public spending significant impacts on economic growth through good governance and transparency. This study highlights that effective fiscal decentralization can enhance public spending efficiency and support economic growth, especially if the spending is directed toward productive sectors such as education and health. Furthermore et al. (2020) who studied the relationship between health spending and economic performance, reinforce the argument that targeted public spending, including DBH allocation, can boost labor productivity and GDP. Meanwhile, the study by Jakovljevic et al. (2020) emphasizes that public expenditure in the health sector has a positive impact on economic growth, particularly in developing countries. This is relevant to the DBH context, where effective fund allocation for essential infrastructure such as health and education can drive regional economic growth.

Since the enactment of Law No. 22 and 25 of 1999, and Law No. 32 of 2004 on decentralization, which was later amended to Law No. 12 of 2008 on regional autonomy, it has been 10 years since the implementation of regional autonomy from 1999 to 2010. The definition of regional autonomy, according to Law No. 12 of 2008,

is the right, authority, and obligation of autonomous regions to regulate and manage their own governmental affairs and local community interests in accordance with applicable laws and regulations.

Regional autonomy in Indonesia aims to improve public services, community welfare, and resource management efficiency while empowering local participation (Moonti, 2019). It seeks to enhance development, reduce dependence on central government, and accelerate regional independence. The implementation of regional autonomy has shown mixed results. While it has improved political participation and governance, the goal of enhancing welfare has not been fully achieved. Decentralization has significantly affected capital expenditure, growth, and welfare, but capital expenditure's impact on welfare is not significant (Badrudin and Siregar, 2015; Duek and Rusli, 2010). Challenges in optimizing public services persist, necessitating modern reforms and acceleration. The allocation of village funds aims to improve public services and increase productivity and empowerment of human resources (Widodo, 2019). Overall, regional autonomy implementation requires continued efforts to achieve its intended objectives.

The Allocation of Natural Resource Revenue (Dana Bagi Hasil Sumber Daya Alam or DBH SDA) to regions is a form of resource management implemented by local governments, aimed at increasing regional independence. However, research findings from the period of regional autonomy in Indonesia, specifically between 2010–2012, show that the economic growth of districts and cities was still significantly influenced by the General Allocation Fund (DAU).

Meanwhile, Regional Original Revenue (PAD) and particularly DBH SDA, which are key components of regional autonomy in managing local natural resources, have been found to have an insignificant effect on regional economic growth. DBH SDA can exacerbate income inequality between resource-rich and resource-poor regions (Mudayen and Maridjo, 2018). Although DBH SDA may positively impact economic growth in resource-producing areas, it can worsen horizontal inequality between provinces (Eisenmenger et al., 2020; Majid et al., 2020). Regions rich in oil, gas, and other natural resources become increasingly wealthier, while those without such resources remain poor. This is due to the fact that the amount of balancing funds is determined by revenue-sharing from taxes and natural wealth. The differing natural resource potentials across regions worsen the inequality between regions. As a unitary state, Indonesia plays a role in redistributing wealth from resource-rich regions to resource-poor regions to prevent sharp disparities.

The General Allocation Fund (DAU) and the Special Allocation Fund (DAK) have not had a significant impact on income inequality (Mudayen and Maridjo, 2018). However, both DAU and Regional Original Revenue (PAD) have been proven to influence the reduction of unemployment (Harsono et al., 2023). Economic growth alone does not necessarily lead to a reduction in unemployment or poverty. The impact of fiscal decentralization on regional disparities may vary between Eastern and Western Indonesia, with DAU having a greater influence in Eastern Indonesia and DBH having a more significant effect in Western Indonesia.

The distribution of Revenue Sharing Funds (DBH) in Indonesia faces several challenges. The arrangement of revenue sharing based on decentralization has not fully reflected the principle of proportionality, leading to perceived inequity for some

regions (Yasa, 2021). The role of DBH from natural resources (DBH SDA) in infrastructure spending remains low, with local governments relying more on other sectors for investment (Hidayat et al., 2024). Issues such as the readiness of local government human resources and the mechanism for collecting taxes in the plantation and forestry sectors pose challenges to fiscal independence (Sandy and Inayati, 2022). Additionally, delays in delivering revenue sharing mechanisms can disrupt regional development planning. To address these issues, strategies such as enhancing the role of DBH SDA through technological advancements, preparing local government human resources, and establishing special rules for tax regionalization have been proposed.

For example, the Cepu Block oil and gas exploitation spans three administrative areas in Java, with the largest distribution in Bojonegoro Regency and Blora Regency. The oil and gas sector has contributed to almost 50% of the regional economic growth in Bojonegoro (Qurbani et al., 2020; Wulandari et al., 2024). Despite its significant oil distribution, Blora Regency does not receive Revenue Sharing Funds due to the well's location in Bojonegoro, as stipulated by Law No. 33 of 2004. This situation has led to fiscal gaps and economic imbalances between regions. The Cepu Block development has influenced the socio-economic conditions of local communities, providing new job opportunities and increasing income for some residents. However, conflicts have arisen between local miners and Pertamina EP regarding the control and exploitation of old oil wells, with differences in legal bases for their activities.

One of the issues regarding the insignificance of DBH SDA in promoting economic growth is its inclusion as an indicator of fiscal capacity. This results in regions that contribute significantly to national foreign exchange earnings from natural resource exploitation facing a reduction or even the elimination of their General Allocation Fund (DAU). At the same time, substantial funds are needed for reclamation and environmental restoration. Moreover, oil and natural gas are national resources, not regional ones, yet they are treated as part of regional assets in DAU allocation. This leads to a reduction in DAU for resource-rich regions, while large areas like Kalimantan, with high DBH SDA, still face poor infrastructure quality and require DAU as a funding source. DAU indirectly affects economic growth through capital expenditure allocation. These issues with DBH SDA hinder economic growth, especially in the context of decentralization, where natural resources could ideally help regions improve their economic performance.

According to Tahir et al. (2024), who examined the relationship between natural resources and economic growth in OECD countries with a focus on environmental impacts, the exploitation of natural resources supports economic growth in the short term but has negative environmental consequences. Hardi et al. (2024) also pointed out that the shadow economy, which remains unregulated, can reduce the effectiveness of fiscal policies, including mechanisms like DBH. Therefore, the effectiveness of DBH in fostering economic growth might be compromised by the existence of an informal economy that reduces state revenue and potentially creates disparities in resource allocation.

According to Garg et al. (2024), who examined factors for sustainable economic growth in G-20 countries, human capital, foreign investment, and revenue from natural resources are crucial in supporting sustainable economic growth. This finding provides

a foundation for discussing the contribution of DBH SDA (Natural Resource Revenue Sharing) to regional economic growth, taking into account allocation efficiency and long-term environmental impacts.

Meanwhile, Fang et al. (2024) who evaluated how green finance and natural resources affect ecological efficiency in China, found that proper management of natural resources can prevent the "resource curse" phenomenon and support regional economic growth. This study can be used to compare how DBH SDA can be optimized to foster economic growth without undermining ecological efficiency in Indonesia.

The utilization of natural resources can increase carbon emissions, which negatively affect environmental quality and long-term economic growth (Perianayagam et al., 2024). Revenue from natural resources managed through mechanisms like DBH should ideally be used to support sustainable development. However, using inefficiently can increase environmental burdens and hinder long-term economic growth (Raihan et al., 2024). Depending on institutional quality, dependence on natural resources can negatively and positively affect economic growth. This suggests that the distribution of natural resource revenue, as seen in DBH mechanisms, has the potential to influence economic growth significantly. Countries with high-quality institutions utilize natural resource revenue more effectively to boost economic growth (Amare et al., 2024).

5. Conclusion

This study reveals that the Natural Resources Revenue Sharing Fund (DBH SDA) has a complex impact on economic growth in Indonesia. The role of local government bureaucrats in managing transfer funds (grants) from the central government, especially DBH SDA, dramatically determines the effectiveness of budget allocation for development. This analysis focuses on the relationship between local government revenues and expenditures, particularly on budget allocation in the primary services sector: Education, Health, and Infrastructure. Through the data panel approach, this study identifies how the development of DBH Natural Resources received by each region affects development indicators.

While appropriately managed, transfer funds can catalyze development, accelerating access to improved public services and creating inclusive and sustainable economic growth. On the contrary, improper management can exacerbate inequality or slow development progress. Thus, policy recommendations to ensure that the DBH SDA has a maximum impact on regional development, several strategic steps need to be taken: (1) Increasing Bureaucratic Capacity. Local governments need to strengthen the competence of the apparatus through a comprehensive training program. This strategy includes improving skills in budget planning and resource management, as well as the implementation of results-oriented development programs. (2) Setting Strategic Priorities. Budget allocation should directly benefit the community's sectors, such as education, health, and infrastructure. This step aims to create a real impact that supports improving the quality of life and accelerating economic development. (3) Tightening the supervision mechanism. Stricter oversight is needed to ensure transfer funds are used transparently and accountable. Using technology in supervision can help monitor budget realization so that it remains following development goals.

Regarding the limitations of this study, it is suggested that the subsequent study involves the variable of gross fixed capital formation, where the role of local governments is to encourage the community to increase the added value of regional superior products. By strengthening this local investment, the regional economy might grow significantly.

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