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THE EFFECT OF OIL PALM PRODUCTIVITY ON THE GROSS REGIONAL DOMESTIC PRODUCT IN WEST KALIMANTAN PROVINCE

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Abstract. The agriculture, forestry, and fisheries sector is the sector with the largest distribution of West Kalimantan's GRDP in 2023. West Kalimantan is the province with the third largest area of palm oil plantations in Indonesia which continues to increase every year along with the amount of production. This also affects the increase in palm oil productivity. Palm oil is the leading plantation commodity for the people of West Kalimantan which has the highest area and production compared to other plantation commodities. This study was conducted to analyze the effect of palm oil productivity on the economy in West Kalimantan Province through the Gross Regional Domestic Product (GRDP). Panel data regression is the method used in this study with the best selected model being the Random Effect Model (REM). The Central Statistics Agency and the Provincial Plantation and Livestock Service are agencies as sources for obtaining secondary data used in this study. Time series data in the form of 12 years of data used starting from 2011 to 2022 from 13 Regencies/Cities in West Kalimantan as cross-section data. This study provides results that palm oil productivity has a positive and significant impact on the Gross Regional Domestic Product (GRDP) in the Agriculture, Forestry and Fisheries sectors of West Kalimantan Province.

Keywords: palm oil, GRDP, productivity

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INTRODUCTION

Economic growth can be measured through the growth of Gross Domestic Product (GDP) at the national level and Gross Regional Domestic Product (GRDP) at the provincial level (Sulistianingsih et al., 2017). Gross Regional Domestic Product (GRDP) is the total value added generated by all business units within a regional or provincial area, or it can also be defined as the total final value of goods and services produced by the overall economic sectors (BPS Kalbar, 2023).

The Indonesian economy continues to grow at a rate above 5 percent (year on year), despite the prevailing global uncertainties (BPS Indonesia, 2023). Based on the price level in 2023, the agriculture, forestry, and fisheries sector contributed significantly to Indonesia's GDP, accounting for 12.53 percent, making it the third largest contributing sector (BPS RI, 2024). This indicates that the agriculture, forestry, and fisheries sector can be considered one of the key economic sectors, playing a highly significant role in the national economy (Kurniawati, 2020). The plantation subsector contributed 3.88 percent in 2023, making it the largest contributor within the overall Agriculture, Forestry, and Fisheries sector (BPS RI, 2024).

Cocoa, coffee, rubber, and oil palm are commodities which have comparative advantages in Indonesia (Maliani et al., 2023). West Kalimantan has an oil palm plantation area of 2,063,840 hectares in 2022, making it the third largest in Indonesia (Disbunnak Kalbar, 2023). In 2023, based on the corresponding price, the Agriculture, Forestry, and Livestock sector contributed to 20.80 percent of the Gross Regional Domestic Product (GRDP) of West Kalimantan Province (BPS Kalbar, 2024). Oil palm is one of the leading commodities in West Kalimantan, as it is more profitable than other crops and has a high economic value. Among plantation commodities in the province, oil palm holds the largest area and highest production compared to other plantation crops. Each year, both the cultivated area and production of oil palm in West Kalimantan continue to increase. Such increases in area and production can influence productivity, and vice versa.

Table 1. Plantation area and production by commodity in West Kalimantan, 2022

No	Commodity	Area (Ha)	Production (Tonne)
1	Kelapa Sawit	2,063,840	7,771,925
2	Karet	579,378	257,643
3	Kelapa Dalam	90,133	76,679
4	Lada	12,593	6,328
5	Kopi	7,669	3,153

Source: Disbunnak Kalbar (2023)

Productivity was initially defined as the ratio of output to input (Kashfi, 2002). The higher the productivity, the greater the output produced (Samuelson & Nordhaus, 2005). Land with high productivity is land that has the capacity to generate large scale and profitable production (Nurmala et al., 2012). However, the current productivity level of oil palm remains below the potential of seed varieties demonstrated in laboratory or pilot project scales. Nevertheless, the productivity level of oil palm is still higher than that of other crops such as soybean, rapeseed, and sunflower, which are categorized as oilseed crops (Sipayung, 2023). As an effort to achieve the national goals of food security, rural poverty reduction, and inclusive economic growth, enhancing agricultural productivity is of critical importance (O'Donnell & Peyrache, 2019).

Based on previous studies (e.g., Sinurat & Cai Cen, 2019; Hasibuan et al., 2019), the effect of oil palm development on GRDP has been confirmed in other regions such as North Sumatra. However, empirical evidence from West Kalimantan—a province with distinct socio-economic, infrastructural, and institutional characteristics—remains scarce. Most prior research has also emphasized production volume or plantation area as key determinants of GRDP, while productivity, which reflects both technical performance and resource-use efficiency, has received less attention. This gap calls for a more focused analysis on how variations in oil palm productivity influence regional economic outcomes.

Therefore, the main aim of this study is to analyze the effect of oil palm productivity on the Gross Regional Domestic Product (GRDP) in the agriculture, forestry, and fisheries sector of West Kalimantan Province. The importance of this study lies in its ability to bridge the knowledge gap between productivity improvement and regional economic growth. Theoretically, it contributes to regional development and agricultural economics literature by providing empirical evidence on the productivity–growth nexus in a plantation-dominated economy. Practically, it offers valuable insights for policymakers and stakeholders in formulating strategies to enhance productivity, optimize land use, and promote sustainable income growth.

METHOD

This study is a quantitative type of research conducted in West Kalimantan Province. West Kalimantan is the third-largest oil palm plantation center in Indonesia and represents the largest plantation commodity in the province compared to other plantation crops. The secondary data used are panel data, which combine time series and cross-sectional data (Caraka, 2017). The productivity of oil palm is measured in kilograms per hectare per year (kg/ha/year), whereas the GRDP in the agriculture, forestry, and fisheries sector is based on constant prices in West Kalimantan Province. The data used cover a 12-year period (time series) from 2011 to 2022 across 13 regencies/cities (cross-sectional data) in West Kalimantan Province. Only 13 out of 14 regencies/cities are included, as Pontianak City does not have oil palm plantations and is therefore excluded from this study. The sources for this research were obtained from the Plantation and Livestock Office (Disbunnak) and the Central Statistics Agency (BPS), both provincial and national, by collecting data from reports or documentation published by those institutions.

After collecting all the data, the next step was to conduct an analysis. Panel data regression was employed as the analytical technique in this study, using Eviews 12 as the analysis tool (Caraka, 2017). Panel data regression is typically represented by equation (1).

$$Y_{it} = \alpha + \beta' x'_{it} + \varepsilon_{it.} \quad (1)$$

This study employs data transformed into natural logarithmic form. The natural logarithm is used to address heteroskedasticity issues and to satisfy the assumptions of classical regression (Montgomery et al., 2021), reduce excessive data fluctuations, and facilitate interpretation in the analysis (Sugiyono, 2012). Natural logarithm by Equation (2).

$$\mathrm{LNPDRB} = \alpha + \beta \mathrm{LNP} + e \quad (2)$$

Where i represents the cross-sectional data of regencies/cities in West Kalimantan Province, t denotes the time-series data covering the years 2011–2022, α is the intercept coefficient of the dependent variable, β is the slope coefficient of the independent variable, LNPDRB is the dependent variable (GRDP), LNP is the independent variable (productivity), and ε is the error component.

Several models in panel data regression, namely the common effect, fixed effect, and random effect models, will be employed for the analysis. The determination of the most appropriate model to be used is carried out through several stages.

Estimation of Panel Data Regression Model

a. Common Effect Model (CEM)

The Common Effect Model (CEM) does not account for individual or time-specific effects and is also referred to as Pooled Regression *(*Ghozali, 2011). It employs the Ordinary Least Squares (OLS) method to estimate the parameters in this model. The model uses one dataset with dependent and independent variables, like standard linear regression (Hill et al., 2011).

b. Fixed Effect Model (FEM)

The Fixed Effect model assumes that individual characteristics change over time. However, the slope coefficients across individuals and over time remain constant. The model's intercept values differ for each person (Ghozali, 2011). The Least Square Dummy Variable (LSDV) method is applied in this model as a parameter estimation technique in linear regression using OLS.

c. Random Effect Model (REM)

The assumption of the Random Effect Model is that all individuals differ, and these differences are captured by the intercept parameters (Hill et al., 2011). The errors in the model capture these differences. The Generalized Least Squares (GLS) method is used for estimation in the Random Effect Model (REM).

Selection of Panel Data Regression Model

The appropriate model selection for panel data regression is carried out through three testing stages: the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. The decision-making process is based on the probability values obtained from each test, which are then compared with the significance level of $\alpha = 5\%$.

a. Chow Test

The decision to choose the appropriate estimation model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM) is made using the Chow test. The hypotheses for the Chow test are as follows:

H_0 : CEM is better than FEM ($\alpha_1 = \alpha_2 = ... = \alpha_N = \alpha$)
H_1 : FEM is better than CEM (there is a minimum of one different intercept α_i)
Significant level : $\alpha = 5\%$

When the Chow statistic is greater than the F-table value or when the probability value is less than α (0.05), the null hypothesis (H_0) is rejected, indicating that the Fixed Effect Model (FEM) is preferable to the Common Effect Model (CEM), and vice versa (Caraka, 2017).

b. Hausman Test

The Hausman test is used to determine the appropriate estimation model between the fixed effect model (FEM) and the random effect model (REM). The hypotheses are as follows:

H_0 : REM is better than FEM (corr (Xit, Uit) = 0)
H_1 : FEM is better than REM (corr (Xit, Uit) # 0)
Significant level : $\alpha = 5\%$

The decision in the Hausman test is based on the Hausman statistic (Caraka, 2017). The Hausman statistic follows a Chi-square distribution, with the degrees of freedom equal to K (the number of independent variables). If the value of Hausman statistic (X^2) is greater than its critical value ($X^{2(K,\ \alpha}$) or if P-Value < α (0.05), it means that the null hypothesis (H_0) is rejected, indicating that the Fixed Effect Model (FEM) is more appropriate. Conversely, if the opposite occurs, H_0 is accepted, making the Random Effect Model (REM) more suitable.

c. Lagrange Multiplier (LM) Test

The Lagrange Multiplier (LM) test is conducted to determine the most appropriate model between the Random Effect Model (REM) and the Common Effect Model (CEM) to be used in the study. The hypotheses for the LM test in this research are as follows:

H_0 : CEM is better than REM ($\sigma_i^2 = \sigma^2$)
H_1 : REM is better than CEM (σ_i^2 # σ^2)

The decision in the LM test is based on the Breusch-Pagan probability value. When the Breusch-Pagan probability value is lower than the significance level ($\alpha = 0.05$), or if LM > $X^{2(1;\alpha)}$, the null hypothesis (H_0) is rejected. It means that the Random Effect Model (REM) is considered more appropriate than the Common Effect Model (CEM) for analysis, and vice versa.

Classical Assumption Test

Not all classical assumption tests need to be performed in every regression model. Only the multicollinearity and heteroskedasticity tests are required (Iqbal, 2015). It is important to conduct a multicollinearity test when more than one independent variable is used. However, if a regression model includes only one independent variable, the multicollinearity test is unnecessary because multicollinearity cannot occur (Basuki & Yuliadi, 2014). This study employs only one independent variable; therefore, the multicollinearity test is unnecessary, and only the heteroskedasticity test is conducted. The heteroskedasticity test is performed to examine whether there is unequal error variance, under the assumption that the error variance in the regression model is constant or equal or homoskedasticity (Mubarak, 2021). Heteroskedasticity commonly occurs in cross-sectional data, and since panel data is more closely related to cross-sectional data than to time series, the heteroskedasticity test needs to be conducted to ensure that the panel data model satisfies the BLUE (Best Linear Unbiased Estimator) assumption (Basuki & Prawoto, 2015). The Glejser test is a statistical procedure that can be used to detect heteroskedasticity. The hypotheses for the heteroskedasticity test in this study are as follows:

$H_0 : \beta_1 = 0$

$H_1 : \beta_1 \neq 0$

Significant level : $\alpha = 5\%$ (0,05)

The rejection region for this test is defined as rejecting H_0 when the probability value of the independent variable obtained from the test is greater than (>) $\alpha = 0.05$. This indicates that the variable is free from heteroskedasticity problem.

Goodness of Fit of the Panel Data Regression Model

a. F-test

The test to determine whether there is a joint or simultaneous effect of the independent variables on the dependent variable is carried out using the F-statistic test. If the calculated $F_{value} > F_{table}$ or if the probability value $< \alpha$ (0.05), it indicates that there is a significant simultaneous effect of the independent variables on the dependent variable.

b. Coefficient of Determination (R^2)

The ability of a regression model to describe the influence of variations in the independent variables on the dependent variable is measured by the coefficient of determination. The coefficient of determination (R^2) assesses the goodness of fit of the regression line. Independent variables are considered effective in explaining the dependent variable when R^2 is large (approaching 1). Conversely, a small R^2 value indicates that the independent variables have limited capability in explaining the dependent variable.

c. T-test

The t-statistic test is used to determine whether an independent variable has a significant individual effect on the dependent variable, assuming all other variables are held constant. If the calculated $t_{value} > t_{table}$ or if the probability value $< \alpha$ (0.05), it indicates that the independent variable has a significant effect on the dependent variable.

RESULT AND DISCUSSION

Company Profile

The productivity of oil palm in several regencies/cities in West Kalimantan increased sequentially from 2020 to 2022, although some other areas experienced declines. Similarly, the GRDP of the agriculture, forestry, and fisheries sector showed annual growth during the same period.

Table 2. Plantation area and production by commodity in West Kalimantan, 2022

Regency/City	2021		2022	
	Productivity	**GRDP**	**Productivity**	**GRDP**
Sambas	3,156	4,990.51	4,474	5,135.83
Bengkayang	2,820	2,098.84	2,802	2,178.22
Landak	1,152	2,775.45	1,814	2,851.18
Mempawah	2,220	1,482.25	1,884	1,511.09
Sanggau	3,643	5,088.82	4,749	5,326.45
Ketapang	4,448	5,247.08	6,073	5,429.43
Sintang	3,047	2,590.80	3,047	2,702.95
Kapuas Hulu	5,172	1,641.08	3,189	1,685.52
Sekadau	8,005	1,794.38	10,739	1,886.39
Melawi	3,783	804.78	2,077	826.45
Kayong Utara	7,323	814.89	4,037	845.45
Kubu Raya	2,925	2,966.90	2,764	3,000.07
Singkawang	1,381	927.53	1,382	962.66

Source: Disbunnak and BPS Kalbar, 2023

Selection of Panel Data Regression Model

a. Chow Test

Table 3. Chow test result

Effects Test	Statistic	d.f	Prob.
Cross-section F	357.444064	(12,142)	0.0000
Cross-section Chi-square	536.737922	12	0.0000

Source: Data Processed, 2024

Referring to the Chow test results, the Cross-section Chi-square probability value is 0.0000, which is less than 0.05, so H_0 is rejected. Thus, the Fixed Effect Model (FEM) is considered more appropriate than the Common Effect Model (CEM). The next test, the Hausman test, is conducted to decide between the FEM and the Random Effect Model (REM).

b. Hausman Test

Table 4. Chow test result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.472705	1	0.4917

Source: Data Processed, 2024

The results of the Hausman test show a probability value of 0.4917, which is greater than 0.05. This indicates that H_0 is accepted and H_1 is rejected. Therefore, the Random Effect Model (REM) is determined to be more appropriate than the Fixed Effect Model (FEM). The next step is the Lagrange Multiplier (LM) test to decide between REM and the Common Effect Model (CEM) as the most suitable model.

c. Lagrange Multiplier (LM) Test)

Table 5. Lagrange multiplier test result

	Test Hypothesis		
	Cross-section	**Time**	**Both**
Breusch-Pagan	785.9058	4.501240	790.4070
	(0.0000)	(0.0339)	(0.0000)

Source: Data Processed, 2024

The Lagrange Multiplier (LM) test results show that the Breusch-Pagan probability value is 0.0000, which is less than 0.05. This indicates the rejection of H_0 and the acceptance of H_1. Thus, the best model selected for analyzing this study is the Random Effect Model (REM). The estimation results of the selected model, REM, are as follows:

Table 6. REM estimation result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.31885	0.252806	123.8849	0.0000
LNP	0.193398	0.022670	8.530882	0.0000
R-squared	0.321664	Mean dependent var		1.688295
Adjusted R-squared	0.317259	S.D. dependent var		0.142240
F-statistic	73.02599	Durbin-Watson stat		0.314490

Source: Data Processed, 2024

The estimation of the Random Effect Model (REM) provides the results presented in the table, which form the basis for the following regression equation (3).

$$LNPDRB = 31.318 + 0.193*LNP \quad (3)$$

The constant value in the equation is 31.318, indicating that when oil palm productivity is assumed to remain constant, the GRDP in the agriculture, forestry, and fisheries sector of West Kalimantan Province is 31.318%. The variable of oil palm productivity in West Kalimantan Province has a positive correlation with GRDP. The regression coefficient of oil palm productivity is 0.193, indicating that every 1% increase in oil palm productivity can raise GRDP, particularly in the agriculture, forestry, and fisheries sector, by 0.193%. Participants in this study report varying intercept estimates. An individual's intercept equals the constant coefficient plus their regency or city's cross-section coefficient. The following are the estimated intercept values for each regency/city after summation.

The constants for each regency/city have different values, meaning that the intercepts also vary across regencies/cities. The intercept value is obtained from the sum of the constant and the coefficient of each regency/city. The highest intercept in this study is found in Ketapang Regency at 32.41279, while the lowest is in Melawi Regency at 30.52397.

The differences in intercept values across regions may be attributed to variations in regional characteristics that cannot be fully explained by the model in this study. Several factors may contribute to these differences, including government policies, socioeconomic conditions of the community, types of economic enterprises, the quality and quantity of labor, infrastructure, and other local conditions.

Each region naturally has diverse agricultural activities, such as rice farming, rubber cultivation, and fisheries, which in turn influence the Gross Regional Domestic Product (GRDP) of each area.

Table 7. Estimation of intercept for each regency/city

Regency/City	Estimation
Sambas	32.1602411 + 0.193LNX
Bengkayang	31.2939985 + 0.193LNX
Landak	31.6127348 + 0.193LNX
Mempawah	31.0244914 + 0.193LNX
Sanggau	32.1418781 + 0.193LNX
Ketapang	32.2197886 + 0.193LNX
Sintang	31.5414125 + 0.193LNX
Kapuas Hulu	31.1014806 + 0.193LNX
Sekadau	31.0511591 + 0.193LNX
Melawi	30.3309752 + 0.193LNX
Kayong Utara	30.3928322 + 0.193LNX
Kubu Raya	31.6558089 + 0.193LNX
Singkawang	30.6183123 + 0.193LNX

Source: Data Processed, 2024

Classical Assumption Test

Only the heteroskedasticity test was conducted in this study. The following are the results of the Glejser test used to examine heteroskedasticity.

Table 8. Glejser test result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.282601	0.191478	1.475895	0.1420
LNP	0.032658	0.021670	1.507077	0.1338

Source: Data Processed, 2024

Based on the results of the Glejser test, the probability value of the productivity variable is 0.1338 > 0.05, which means that H_0 is rejected and H_1 is accepted. Thus, it can be concluded that the palm oil productivity variable does not exhibit heteroskedasticity problems.

Goodness of Fit of the Panel Data Regression Model

a. F-Test

F-Test produced F_{value} of 73.02599 > F_{table} of 3.90, with a probability value of 0.0000 < 0.05, as shown in Table 5 of the REM results in this study. Therefore, H_0 is rejected, indicating that palm oil productivity has a joint and significant effect on GRDP in the agriculture, forestry, and fisheries sectors in West Kalimantan Province.

b. Coefficient of Determination

The coefficient of determination, as indicated by the R-squared (R^2) value from the Random Effect Model estimation in Table 5, is 0.321664. This value shows that the effect of productivity on GRDP in the agriculture, forestry, and fisheries sectors in West Kalimantan Province is 32.1664%. Meanwhile, the remaining 67.8336% can be explained by other variables not included in this study.

This indicates that the ability of palm oil productivity to explain GRDP is relatively weak. This may be due to the independent variable in this study—palm oil productivity—being less effective and not specific enough to fully account for variations in GRDP, resulting in a low R-squared value.

c. T-test

Based on T-test shown in table 5, variable of oil palm productivity has t_{value} of 8.530882 > t_{table} of 1.65481, with probability of 0.0000 < 0.05. That, based on these results, H_0 is rejected, indicating that the variable of palm oil productivity individually has a significant influence on GRDP in the agriculture, forestry, and fisheries sectors in West Kalimantan Province.

The Effect of Productivity on The Gross Regional Domestic Product

Based on the REM estimation results in Table 5, the study indicates a positive and significant correlation between palm oil productivity and the Gross Regional Domestic Product (GRDP) in the agriculture, forestry, and fisheries sectors. It can be concluded that higher palm oil productivity can increase GRDP, which in turn suggests that economic growth may also improve. Thus, palm oil productivity has the potential to positively influence regional economic development. This finding is consistent with the theory stating that agricultural productivity needs to be enhanced as an effort to achieve the national goal of inclusive economic growth (O'Donnell & Peyrache, 2019).

The result of this study is consistent with Sinurat & Cai Cen (2019) dan Hasibuan et al., (2019) which explain the positive and significant impact of oil palm productivity on economic growth as measured by GRDP in North Sumatra. Nevertheless, oil palm productivity has a relatively small effect on GRDP in the agriculture, forestry, and fisheries sectors of West Kalimantan Province. An increase of 1% in palm oil productivity can only raise the GRDP of the agricultural sector by 0.193%. The level of oil palm productivity in West Kalimantan Province remains relatively low, ranging between 1,630 and 4,560 kg/ha/year (Disbunnak Kalbar, 2023). The target for palm oil productivity in Indonesia, as stated by the Ministry of Agriculture, is approximately 36 tons/ha/year.

Theoretically, high productivity can be a factor contributing to an increase in total production (Samuelson & Nordhaus, 2005). Based on the research of Sudianti (2018) in Tanah Bumbu Regency, there has been positive development in oil palm plantation productivity, with noticeable increases. This growth has resulted in both higher quantities and improved quality of oil palm production. The substantial production levels contribute to boosting community income, thereby helping reduce poverty rates and fostering regional economic growth. Although the effect of oil palm production on poverty is negative, it is not statistically significant. Nevertheless, when oil palm production increases, it has the potential to reduce poverty levels in each region (Bintariningtyas & Juwita, 2021).

Oil palm plantations are undoubtedly an important sector in a region's economy. Based on the research conducted by Pratama (2023) and Sidabutar (2022) that oil palm plantations play a role in meeting needs, increasing community income, and contributing positively to the regional economy. Therefore, efforts are needed to further increase palm oil production, which can be achieved by improving productivity. The enhancement of oil palm productivity can be pursued through government subsidy programs, as shown in the research conducted by Jingjing et al., (2024). These efforts can enhance productivity and contribute to community welfare, particularly for farmers; therefore, the provision of subsidies is necessary. The government may target institutions related to oil palm as subsidy providers. Such subsidies may take the form of fertilizer subsidies and low-interest credit with simplified procedures (Napitupulu et al., 2020). In addition, proper and efficient fertilization, which enriches soil nutrients for healthy and high-quality plant growth, can enhance oil palm productivity (Pranata & Afrianti, 2020). Efforts to improve oil palm productivity can also be undertaken through land expansion, rehabilitation of existing plantation areas, intensification, and effective plantation management (Herdiansyah et al., 2020).

CONCLUSIONS

The productivity of oil palm has an impact on GRDP, particularly in the agriculture, forestry, and fisheries sector in West Kalimantan Province, as evidenced by the results of the t-test and F-test. Based on the analysis of the REM estimation model, the coefficient value of oil palm productivity obtained is 0.193%. This coefficient indicates that every 1% increase in oil palm productivity can raise the GRDP of the agriculture, forestry, and fisheries sector by 0.193%. Therefore, oil palm productivity needs to be improved as part of efforts to further enhance GRDP, especially in West Kalimantan Province.

Ketapang Regency recorded the highest GRDP in West Kalimantan Province, amounting to IDR 5,429,430,000,000 in 2022. In contrast, Melawi Regency had the lowest GRDP at IDR 826,450,000,000 in the same year. Meanwhile, the region with the highest oil palm productivity was Sekadau Regency, reaching 10,739 kg/ha/year of fresh fruit bunches in 2022, while the lowest productivity was found in Singkawang City at 1,382 kg/ha/year of fresh fruit bunches.

The variation in intercept values across regencies and cities indicates the presence of distinct characteristics that cannot be explained within the model. Various regional factors, such as policies, socio-economic conditions, labor quality and quantity, infrastructure, different types of farming, and other economic enterprises, may account for these differences.

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REFERENCES

Basuki, A. T., & Prawoto, N. (2015). *Analisis Regresi dalam Penelitian Ekonomi dan Bisnis*. Rajagrafindo Persada. https://scholar.google.com/citations?view_op=view_citation&hl=en&user=6LJPYbIAAAAJ&citation_for_view=6LJPYbIAAAAJ:2P1L_qKh6hAC

Basuki, A. T., & Yuliadi, I. (2014). *Electronic Data Processing (SPSS 15 dan EVIEWS 7)* (Pertama). Danisa Media. https://adoc.pub/electronic-data-processing-spss-15-dan-eviews-7.html

Bintariningtyas, S., & Juwita, A. H. (2021). Perkebunan kelapa sawit dalam pengentasan kemiskinan di Provinsi Kalimantan Tengah. *Jurnal Ekonomi Manajemen Dan Akuntansi*, *23*(2), 199–205. https://journal.feb.unmul.ac.id/index.php/FORUMEKONOMI/article/view/9389/1270

BPS Indonesia. (2023). *Pertumbuhan Ekonomi Indonesia Triwulan IV-2022*. https://www.bps.go.id/id/pressrelease/2023/02/06/1997/ekonomi-indonesia-tahun-2022-tumbuh-5-31-persen.html

BPS Kalbar. (2023). *Produk Domestik Regional Bruto Kabupaten/Kota Provinsi Kalimantan Barat Menurut Pengeluaran 2018-2022*. Badan Pusat Statistik Provinsi Kalimantan Barat. https://kalbar.bps.go.id/publication/download.html?nrbvfeve=N2FiYjEzZTE1YWFjNmY1NjY2NDNhN2Ni&xzmn=aHR0cHM6Ly9rYWxiYXIuYnBzLmdvLmlkL3B1YmxpY2F0aW9uLzIwMjMvMDcvMDUvN2FiYjEzZTE1YWFjNmY1NjY2NDNhN2NiL3Byb2R1ay1kb21lc3Rpay1yZWdpb25hbC1icnV0by1rYWJ1cGF0ZW4ta290Y

BPS Kalbar. (2024). *Distribusi PDRB seri 2010 Menurut Lapangan Usaha (Persen), 2023*. Badan Pusat Statistik. https://kalbar.bps.go.id/indicator/52/71/1/distribusi-pdrb-seri-2010-menurut-lapangan-usaha.html

BPS RI. (2024). *[Seri 2010] Distribusi PDB Menurut Lapangan Usaha Seri 2010 Atas Dasar Harga Berlaku (Persen), 2023*. Badan Pusat Statistik. https://www.bps.go.id/id/statistics-table/2/MTA2IzI=/-seri-2010--distribusi-pdb-menurut-lapangan-usaha-seri-2010-atas-dasar-harga-berlaku--persen-.html

Caraka, R. E. (2017). *Spatial Data Panel*. Wade Group. http://eprints.undip.ac.id/63186/1/upload_sdpp.pdf

Disbunnak Kalbar. (2023). *Statistik Perkebunan*. https://disbunnak.kalbarprov.go.id/

Ghozali, I. (2011). *Aplikasi Analisis Multivariate dengan Program IBM SPSS 19* (5th ed.). Universias Diponegoro. https://www.academia.edu/86315138/Ghozali_Imam_2011_Aplikasi_Analisis_Multivariate_Dengan_Program_SPSS_versi_19_Semarang_Universitas_Diponegoro

Hasibuan, M., Nurdelila, & Rahmat. (2019). Pengaruh produktivitas perkebunan kelapa sawit terhadap produk domestik regional bruto serta dampaknya pada pengentasan kemiskinan di Provinsi Sumatera Utara. *Jurnal Ekonomi*, *21*(3), 328. https://ejournal.borobudur.ac.id/index.php/1/article/view/610/585

Herdiansyah, H., Negoro, H. A., Rusdayanti, N., & Shara, S. (2020). Palm oil plantation and cultivation: prosperity and productivity of smallholders. *Open Agriculture*, *5*(1), 617–630. https://doi.org/10.1515/opag-2020-0063

Hill, R. C., Griffiths, W. E., & Lim, G. C. (2011). *Principles of Econometrics* (Fourth). John Wiley and Sons. http://zalamsyah.staff.unja.ac.id/wp-content/uploads/sites/286/2019/11/7-Principles-of-Econometrics-4th-Ed.-R.Carter-Hill-et.al_.-1.pdf

Iqbal, M. (2015). Pengolahan data dengan regresi linier berganda. In *Perbanas Institute*. https://scholar.google.com/scholar?hl=id&as_sdt=0%2C5&q=Pengolahan+Data+dengan+Regresi+Linier+Berganda+%28dengan+SPSS+iqbal&btnG=#d=gs_cit&t=1706180899305&u=%2Fscholar%3Fq%3Dinfo%3AlrJPalJ3-w4J%3Ascholar.google.com%2F%26output%3Dcite%26scirp%3D0%26hl%3Did

Jingjing, L., Suib, N. A. M., Salleh, N. H. M., Hashim, K., & Shukor, M. S. (2024). Effect of palm oil subsidies on productivity and well-being of independent smallholders. *Jurnal Ekonomi Malaysia*, *58*(1). https://doi.org/10.17576/JEM-2024-5801-04

Kashfi, H. A. (2002). Quality and productivity in the 21st century. In *International Convention on Quality Improvement*. http://www.piqc.edu.pk/casestudies/Dr_Hesamiddin_Aref_Kashfi_Quality_and_Productivity_in_the_21st_Century_Productivity_Case_Study_PIQC.pdf

Kurniawati, S. (2020). Kinerja sektor pertanian di Indonesia. *Prosiding Seminar Akademik Tahunan Ilmu Ekonomi Dan Studi Pembangunan 2020*, 24–31.

Maliani, T., Asmita, N., Sihombing, R., & Andini, P. (2023). Pengaruh produksi kelapa sawit dan luas areal perkebunan kelapa sawit terhadap produk domestik regional bruto (pdrb) sektor perkebunan Provinsi Aceh. *Akuntansi: Jurnal Riset Ilmu Akuntansi*, *2*(4), 330–341. https://doi.org/https://doi.org/10.55606/akuntansi.v2i4.1428

Montgomery, D. C., Peck, E. A., & Vining, G. G. (2021). *Introduction to Linear Regression Analysis* (6th ed.). Wiley. https://books.google.co.id/books?hl=id&lr=&id=tCIgEAAAQBAJ&oi=fnd&pg=PR13&dq=Introduction+to+Linear+Regression+Analysis+(5th+ed.).+Montgomery,+Douglas+C.,+Peck,+Elizabeth+A.,+%26+Vining,+G.+Geoffrey+(2012)&ots=lgwaVyl1Mp&sig=5R3T4bU9llH1jOoPXVTVgx42MTg&re

Mubarak, R. (2021). *Pengantar Ekonometrika* (F. Firmansyah & F. Nuryana (eds.); Pertama). Duta Media. http://repository.iainmadura.ac.id/766/1/Buku Pengantar Ekonometrika-B5 fix.pdf

Napitupulu, D. M., Nainggolan, S., & Murdy, S. (2020). Kajian efisiensi teknis, sumber inefisiensi dan preferensi risiko petani serta implikasinya pada upaya peningkatan produktivitas perkebunan kelapa sawit di Provinsi Jambi. *Journal Of Agribusiness and Local Wisdom*, *3*(2). https://doi.org/https://doi.org/10.22437/jalow.v3i2.11614

Nurmala, T., Suyono, A. D., Rodjak, A., Suganda, T., Natasasmita, S., Simarmata, T., Salim, E. H., Yuwariah, Y., Sendjaja, T. P., Wiyono, S. N., & Hasani, S. (2012). *Pengantar Ilmu Pertanian* (Pertama). Graha Ilmu. https://docplayer.info/33954870-Pengantar-ilmu-pertanian-oleh-tati-nurmala-aisyah-d-suyono.html

O'Donnell, C., & Peyrache, A. (2019). *Agricultural Productivity in Asia : Measures and Perspectives 2019*. https://www.apo-tokyo.org/wp-content/uploads/2019/12/Agriculture-Productivity-in-Asia_Measures-and-Perspectives-2019.pdf

Pranata, A., & Afrianti, S. (2020). Analisis faktor-faktor yang mempengaruhi poduktivitas kelapa sawit (Elaeis guineensis Jacq) di Afdeling I Kebun Adolina PT. Perkebunan Nusantara IV. *Jurnal Pertanian Berkelanjutan*, *8*(3). https://core.ac.uk/download/pdf/357741781.pdf

Pratama, S. A. (2023). *Analisis Peranan Sektor Perkebunan Sawit dalam Meningkatkan Pendapatan Perekonomian Masyarakat Perspektif Ekonomi Islam (Studi Pada Desa Karang Jawa, Kecamatan Anak Ratu Aji, Kabupaten Lampung Tengah)* [Universitas Lampung]. http://repository.radenintan.ac.id/31355/1/SKRIPSI SYAHFANI 1 DAN 5 %283%29.pdf

Samuelson, P. A., & Nordhaus, W. D. (2005). *Ilmu Makro Ekonomi*. Gramedia Global Edukasi.

Sidabutar, F. (2022). *Analisis Peranan Perkebunan Kelapa Sawit terhadap Pertumbuhan Ekonomi di kabupaten Baranghari* [Universitas Jambi]. https://repository.unja.ac.id/32813/

Sinurat, M., & Cai Cen, C. (2019). Dampak perkebunan terhadap pertumbuhan ekonomi dan kemiskinan Di Sumatera Utara. *Jurnal Pasar Modal Dan Bisnis*, *1*(2), 105–116. https://doi.org/10.37194/jpmb.v1i2.24

Sipayung, T. (2023, February). *Jurnal Kelapa Sawit dan Produktivitas*. PASPI. https://palmoilina.asia/jurnal-kelapa-sawit/sawit-dan-produktivitas/

Sudianti, N. K. (2018). Analisis perkembangan perkebunan kelapa sawit di Kabupaten Tanah Bumbu. *Jurnal Ilmu Ekonomi Dan Pembangunan*, *1*(2), 241–248. https://ppjp.ulm.ac.id/journals/index.php/jiep/article/view/1133/1954

Sugiyono. (2012). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Sulistianingsih, E., Kiftiah, M., Rosadi, D., & Wahyuni, H. (2017). Analysis of palm oil production, export, and government consumption to gross domestic product of five districts in West Kalimantan by panel regression. *Journal of Physics: Conference Series*, *824*, 012031. https://doi.org/10.1088/1742-6596/824/1/012031