

CHAPTER 1

CURRENT TRENDS IN ECONOMIC DEVELOPMENT

DECENTRALIZATION'S IMPACT ON ECONOMIC GROWTH: A COMPARATIVE ANALYSIS

Putri Meliza Sari¹, Hefrizal Handra², Efa Yonnedi³

¹Faculty of Economics and Business, Universitas PGRI Sumatera Barat, Indonesia

²Faculty of Economics and Business, Universitas Andalas, Indonesia

³Faculty of Economics and Business, Universitas Andalas, Indonesia

Corresponding Author: putrimelizasari@gmail.com

Citation:

Meliza Sari, P., Handra, H., & Yonnedi, E. (2023). DECENTRALIZATION'S IMPACT ON ECONOMIC GROWTH: A COMPARATIVE ANALYSIS. *Economics, Finance and Management Review*, (4), 4–19. <https://doi.org/10.36690/2674-5208-2023-4-4-19>

Received: October 20, 2023

Approved: December 21, 2023

Published: December 30, 2023



This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY-NC 4.0\)](https://creativecommons.org/licenses/by-nc/4.0/) license



Abstract. This research aims to examine the effect of decentralization, tax revenues as a percentage of GDP, and foreign investment on economic growth using multiple linear regression analysis. The introduction provides a contextual understanding of the importance of understanding the factors that influence economic growth amidst policy changes from pre-decentralization to post-decentralization. Time series data for 49 years (1977-2021) was used for analysis. The independent variables decentralization, tax revenue as a percentage of GDP, and foreign investment were subjected to multiple linear regression on the dependent variable, namely economic growth. Statistical analysis includes evaluation of coefficients, *p* values, *F* statistics, and *R*-squared. The findings show that decentralization and foreign investment have a significant impact on economic growth. However, tax revenues as a percentage of GDP do not show a significant effect on economic growth. This study underscores the important role of decentralization policies and foreign investment in shaping economic growth. This emphasizes the need to formulate economic policy strategies that take these factors into account. However, further research is needed on tax revenues as a percentage of GDP within the scope of this analysis.

Keywords: economic growth; decentralization; foreign investment; tax revenue.

JEL Classification: O43; H77; O11

Formulas: 1; **fig.:** 3; **tabl.:** 6; **bibl.:** 21

Introduction. The implementation of decentralization in Indonesia aims to foster regional development, fortify state capacity, and enhance public service quality (Sholikin, 2018; Talitha et al., 2020; Trisakti & Djajasinga, 2021). It has endowed subnational governments with amplified authority, political clout, and financial resources, empowering them to assume diverse responsibilities across sectors such as healthcare, education, infrastructure, environment, and agriculture. While decentralization has notably enhanced local-level public service delivery and administration, disparities persist in local state capacity. Complexities arise in policy coordination between central and subnational governments due to political interventions at both tiers. The decentralization initiative also seeks to optimize public services, governance, and societal well-being. However, challenges persist, hindering the acceleration of local government programs and the maximization of public services.

Several studies have evaluated the implementation of decentralization in Indonesia, particularly by comparing economic growth, tax revenues, and foreign investment pre- and post-regional autonomy. These assessments have elucidated varied effects on poverty, human development, inequality, and fiscal decentralization concerning economic growth and expansion in Indonesia's post-regional autonomy (Hutajulu et al., 2020). Analysis of foreign direct investment (FDI) determinants before and during regional autonomy revealed that resources and competitiveness significantly influenced FDI inflows across provinces (Sodik et al., 2019). Moreover, while fiscal decentralization policies positively impacted economic growth, they did not mitigate regional imbalances in eastern Indonesia (Lamba et al., 2019). Overall, these studies shed light on the impact of regional autonomy on economic indicators in Indonesia.

In a macroeconomic context, government expenditure constitutes a pivotal component of gross domestic product (GDP), reflecting total income and national expenditure on goods and services. Economists and policymakers are concerned not only with the overall output but also with the allocation of expenditure among different categories. The national income postulates GDP into four expenditure groups: consumption, investment, government expenditure, and net exports (Todaro & Smith, 2011). Government spending, part of fiscal policy, intervenes in the economy to execute various functions (Azwar, 2016). These functions, encompassing allocation, distribution, and stabilization, are managed by the government through fiscal policy (Musgrave, 1989). Fiscal decentralization in Indonesia aligns with the government's distribution function, intending to allocate budgets from higher to lower levels of government, supporting delegated government tasks and public services (Indonesia Fiskal, 2021).

Decentralization has gained traction globally as a bureaucratic reform process with the potential to enhance government quality. The transfer of authority, responsibility, and resources through deconcentration, delegation, or devolution from the center to lower administrative levels defines decentralization (Rondinelli, 1981; Rondinelli et al., 1983). In the context of Indonesia, decentralization entails transferring government control to autonomous regions for self-regulation and

management (Indonesia Fiskal, 2021). This decentralized system also distributes financial responsibilities, ensuring that regions can finance their development as they assume delegated duties from the central government (money follows functions).

Despite the benefits, decentralization encounters challenges. Research Rock (2018) highlights concerns over Indonesia's decentralization starting in 1999, questioning whether growth and investment truly materialized post-implementation. Similarly, (Pepinsky & Wihardja, 2011) associated Indonesia's economic growth slowdown with decentralization. To understand this, a comparison of growth rates pre-regional autonomy (1973-1999) and during decentralization (2000-2022) is necessary.

Literature review. The inception of fiscal decentralization in Indonesia can be traced back to the enactment of Law Number 22 of 1999 concerning Regional Government and Law Number 25 of 1999 concerning Financial Balance between the Central and Regional Governments. This marked the genesis of fiscal decentralization, empowering regions with authority over income and expenditure management. Nonetheless, most revenue sources remain under central government control. Regional governments are granted autonomy in budget management, enabling access to original regional revenue sources as per legal provisions. The effective initiation of fiscal decentralization commenced in 2001, manifesting in a noteworthy surge of transfer funds in the State Revenue and Expenditure Budget (APBN), escalating by 145.06% from 2000 to 2001, totaling IDR 81.05 trillion. This implementation signifies the advent of a new era of regional autonomy in Indonesia (Fiskal, 2021).

Furthermore, (Musgrave, 1989) delineates that the handling of tax revenues or public expenditure exerts multifaceted influences on the economy, necessitating designs to serve diverse objectives. These policy objectives include (1) The allocation function, wherein resources are allocated between private goods and social goods, which does not encompass regulatory policies; (2) The distribution function, aligning income and wealth distribution with societal perceptions of fairness; and (3) The use of budget policy for maintaining high employment, price stability, and economic growth while considering trade impacts and balance of payments for the stabilization function.

Decentralized decision-making processes tend to be more efficient owing to enhanced information accessibility, given that local governments possess better regional knowledge than the central government in managing public finances. Decentralized governance can restore public policy confidence and foster broader policy consensus. It addresses demands for democratic ideals through decentralization, curbing social and political tensions inherent in local autonomy. Administrative decentralization (Kis-Katos & Sjahrir, 2017) induces shifts in government officials' attitudes and behaviors, facilitating planning and boosting community participation in development activities. As local governments take the lead in public goods provision, comprehending the impact of fiscal decentralization on economic growth becomes increasingly crucial (Martinez et al., 2017; Rondinelli, 1981; Rondinelli, 1983; Rondinelli, 2007).

Decentralization's ongoing development across nations involves systematically transferring power from central to regional governments, aiming for enhanced effectiveness and responsiveness in regional service delivery. By delegating authority to regions, opportunities for investment and international trade increase, enabling more efficient market participation. Beyond bolstering local institutions, decentralization empowers communities to manage resources effectively, employing a bottom-up approach to development agendas (Indonesia Fiskal, 2021).

Decentralization profoundly impacts economic growth. Fiscal decentralization demonstrates a positive influence on economic growth, particularly in regions with low public infrastructure per efficient worker and high human capital per worker (Hassan, 2022). Panel data analysis across 18 countries corroborates the significant relationship between fiscal decentralization and economic growth. Additionally, state revenues from taxes and foreign investments notably impact economic growth. Studies illustrate the substantial contributions of foreign direct investment (FDI) and oil revenues to economic growth in countries like Nigeria (Andrašić et al., 2018). Research underscores the positive effect of increased tax revenue growth on Gross Domestic Product (GDP) (Andrašić et al., 2018). FDI plays a crucial role in economic development by catalyzing foreign trade and technology transfer (Mohs et al., 2018). Therefore, both tax revenues and FDI play pivotal roles in economic growth, where their integration with decentralization can profoundly shape a country's economic performance. The hypothesis posits that decentralization, tax revenues, and foreign investment collectively and individually influence a country's economic growth.

Aims. This research aims to examine the effect of decentralization, tax revenues as a percentage of GDP, and foreign investment on economic growth using multiple linear regression analysis.

Methodology. Data and Model Specifications. The research design employed in this study utilizes a quantitative approach, utilizing time series data specific to Indonesia for two distinct periods: pre-implementation of regional decentralization (1977-1999) and post-implementation of decentralization (2000-2022). The data utilized is sourced from the World Bank indicator data. The variables observed encompass economic growth (GDP), a Decentralization dummy variable denoting the post-decentralization period (coded as 1) and pre-decentralization (coded as 0), the percentage of tax revenues based on GDP (Taxrev), and foreign direct investment (FDI). The empirical model used for analysis is articulated as follows:

$$Gdp = a + b1decentralization + b2taxrev + b3fdi + \varepsilon t \quad (1)$$

The data analysis method employed involves multiple linear regression analysis, enabling the extraction of general conclusions from compiled and processed data. Additionally, the study incorporates a parametric test, specifically the paired sample t-test. Before conducting these tests, the study conducts classical assumption tests to verify normality, heteroscedasticity, and multicollinearity within the data. Once these

classical assumption tests confirm no issues, the paired sample t-test and difference test analysis can proceed.

This approach allows for a systematic examination of the impact of decentralization, tax revenue based on GDP, and foreign direct investment on Indonesia's economic growth across distinct periods, thereby contributing to a comprehensive understanding of the effects of decentralization on the country's economic landscape

Table 1. Research Variables

Variables	Definition	Data source
GDP growth (annual %)	change in the total value of goods and services produced by a country during one year	WDI World Bank
Decentralization	Dummy Variables: 0 = predcentralization (1977-2000) 1 = post decentralization (2001-2021)	Year of implementation
Tax revenue (% of GDP)	The proportion of taxes in a country's economy	WDI World Bank
Foreign direct investment, net inflows (BoP, current US\$)	amount of investment invested directly from abroad into a country's economy in a certain period.	WDI World Bank

Descriptive statistics. Descriptive statistical analysis serves to offer a comprehensive overview of the studied variables, including economic growth, decentralization, tax revenues as a percentage of GDP, and the volume of foreign investment, denoted in US Dollars (US\$). This analytical approach furnishes detailed insights into the variability, central tendencies (such as averages or means), and distributional characteristics of each variable. It allows for a deeper understanding of the data's spread, central values, and how the data is distributed across various levels, thereby establishing a foundational understanding essential for subsequent analytical procedures and interpretations.

Table 2. Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Economic growth	49	5.27	3.35	-13.13	10.00
Decentralization (Dummy Variable)	49	0.4285714	0.5	0	1
Tax Revenue (%GDP)	49	14.45857	3.457047	8.31	21.95
Foreign Investment	49	5.95E+09	8.62E+09	-4.55E+09	2.51E+10

Source: Processed data, 2023

The analysis of variables provides significant insights into the studied parameters. Economic growth exhibits an average of 5.27%, with a standard deviation of approximately 3.35. The data showcases considerable variability, ranging from a minimum of -13.13% to a maximum of 10%. This wide range signifies substantial fluctuations in economic performance over the observed period. Regarding the Decentralization Variable (Dummy Variable), it presents an average of 0.43, accompanied by a standard deviation of around 0.5. The relatively low mean suggests that, on average, fewer regions or areas were categorized as decentralized

during the observation period. Tax revenue, averaging around 14.46% as a percentage of GDP, demonstrates a standard deviation of 3.46. The data displays a notable range, spanning from a minimum of 8.31% to a maximum of 21.95%, indicating significant variations in tax collection relative to GDP throughout the observed timeframe. Concerning Foreign Investment, the average stands at approximately \$5.95 billion, with a standard deviation of around \$8.62 billion. Substantial variations are evident, ranging from a minimum of -\$4.55 billion (indicating investment outflows or withdrawals) to a maximum of \$25.1 billion. These fluctuations suggest significant variations in incoming or outgoing foreign investment during the observation period. Overall, the data depicts considerable variations, as indicated by significant means and standard deviations, across economic growth, decentralization levels, tax revenues as a percentage of GDP, and foreign investment amounts in dollar terms throughout the observed period.

Classic assumption test. Classical assumption tests serve as fundamental statistical assessments necessary before applying certain analytical techniques. These tests validate critical assumptions such as data normality, variance homogeneity, and data independence. Failure to meet these assumptions can render statistical techniques invalid or introduce bias into the results. In this study, we conducted tests to assess classical assumptions for both data collection periods: pre-implementation of decentralization and post-implementation of decentralization. The aim was to ensure that the data conformed to these key assumptions before proceeding with the chosen statistical analyses, thereby upholding the validity and reliability of the subsequent analytical procedures.

Normality test. The Normal Quantile Plot is a graphical tool employed to assess the adherence of a data sample to a normal distribution. This plot arranges data points along the horizontal axis according to their order, and on the vertical axis, these points are positioned in a manner that, if the data conforms to a normal distribution, they tend to form a linear or nearly linear pattern. This graphical representation allows for a visual examination of whether the observed data points align with the expected pattern indicative of a normal distribution. Deviations from a straight-line pattern in the plot may suggest departures from normality in the dataset under examination.

The observation that the points on the Normal Quantile Plot graph closely approximate a straight line indicates a pattern that aligns with a normal distribution. This observation supports the assumption that the dataset tends to follow a normal distribution. When data points conform closely to a straight-line pattern on the plot, it suggests that the distribution of the data is in line with the characteristics expected in a normal distribution, affirming the validity of assuming normality within the dataset.

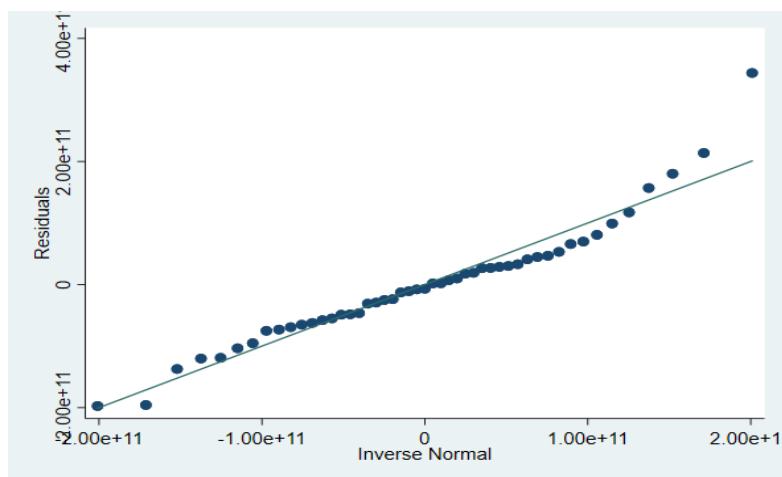


Figure 4. Normal Quantile Plot

Heteroscedasticity of the test. Heteroscedasticity analysis is a crucial statistical procedure that evaluates the variability of errors within a regression model. In this study, the Breusch-Pagan / Cook-Weisberg test serves to ascertain if the variance of residuals (i.e., estimation errors) in a linear regression model is contingent upon the predicted values. Specifically, the estimated values derived from the Economic Growth variable are utilized in this analysis. The primary objective is to assess whether the variance in the regression model remains consistent or exhibits heteroscedasticity, a condition where the variance of errors differs across the range of predicted values. Interpreting the results of this test aids in drawing appropriate conclusions regarding the validity of variance assumptions within the regression model, influencing the accuracy and reliability of the statistical inferences drawn from the analysis.

Table 3. Results of the Breusch-Pagan / Cook-Weisberg Test for Heteroscedasticity

Test	Results
Ho: Constant variance	
Variable	Fitted Values of Economic Growth
chi2(1)	1.84
Prob > chi2	0.1755

Source: processed data, 2023

Based on the results obtained from the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity, where the null hypothesis suggests constant variance, the calculated chi-square value is 1.84, associated with a probability value (Prob > chi2) of 0.1755. With the probability value of 0.1755 exceeding the significance level of 0.05, it indicates insufficient statistical evidence to reject the null hypothesis. Thus, based on this heteroscedasticity test, there is not enough evidence to support the claim that there exists a violation of the assumption of constant variance within the model utilized for fitted values of Economic Growth. Therefore, the analysis suggests that the variance across predicted values remains relatively consistent, adhering to the assumption of constant variance in the model.

Multicollinearity Test. In regression analysis, Multicollinearity arises when two or more independent variables within the regression model exhibit a strong relationship, complicating the distinction of each variable's impact on the dependent variable. In this study, Multicollinearity was assessed using the Variance Inflation Factor (VIF). VIF quantifies the extent to which the variance of the regression coefficient for a particular variable can be clarified or predicted by other variables in the model. Generally, VIF values surpassing 10 may indicate substantial multicollinearity, although in some cases, values above 5 are also considered indicative of multicollinearity.

Table 4. Multicollinearity Test

Variables	VIF	1/VIF
Decentralization	3.34	0.299489
Tax Revenue (%GDP)	3.27	0.30544
Foreign Investment	1.04	0.958811
Mean VIF	2.55	

Source: processed data, 2023

The Variance Inflation Factor (VIF) values for the variables in the model are as follows: the Decentralization variable has a VIF of 3.34, signifying that its variability is 3.34 times greater than expected if it were uncorrelated with other variables in the model. Tax Revenue (%GDP) similarly exhibits a VIF of 3.27. In contrast, Foreign Investment shows a notably lower VIF of 1.04. The average VIF across all variables stands at 2.55, which falls below the commonly used threshold indicating multicollinearity. Although both the Decentralization and Tax Revenue (%GDP) variables possess VIF values above 2 (a marker often viewed as a potential indication of multicollinearity), they haven't surpassed the more critical threshold of 10. Conversely, the Foreign Investment variable presents a low VIF, suggesting a lack of significant correlation with other independent variables in the model. Consequently, while there are indications of moderate correlation among some variables, the overall VIF values suggest that severe multicollinearity is not a prevailing concern within the model.

Paired *t* Test (Paired *t* Test). Table 5 which represents the paired t-tests conducted to assess differences in specific variables before and after the implementation of Decentralization. Paired t-tests are employed to determine the significance of differences between two related observations within a single group. In this particular context, four variables have been under scrutiny: Economic Growth, Foreign Investment, Tax Revenue as a percentage of GDP, and GDP.

The comparative analysis between the periods before and after decentralization involved various tests on key economic variables such as economic growth, foreign investment, tax revenues as a percentage of GDP, and GDP itself. The primary objective was to comprehend the impact of these events on crucial aspects of the economy. Emphasis was placed on identifying significant changes between the observed periods for each variable and interpreting the results of the different tests conducted. Regarding economic growth, the average difference between pre and

post-decentralization was approximately 0.724, with a standard error of around 0.972. These statistics indicate that there isn't enough statistical evidence to support a significant difference in economic growth before and after decentralization.

Table 5. Paired tests

Variables	Diff	Std. Errr.	t-value	p-value (Ho: diff = 0)	Conclusion
Economic growth	0.7241666	0.9727866	0.7444	Pr(T > t) = 0.4603	Not significant
Foreign Investment	-1.19E+10	1.82E+09	-6.5174	Pr(T < t) = 0.0000	Highly significant
Tax Revenue (% GDP)	5.76	0.5578664	10.3251	Pr(T < t) = 1.0000	Highly significant
GDP	-5.93E+11	6.62E+10	-8,956	Pr(T < t) = 0.0000	Highly significant

Source: Processed data, 2023

In the case of foreign investment, the average difference between pre and post-periods showed a value of around -\$11.9 billion (negative value), with a standard error of approximately \$1.82 billion. This indicates a highly statistically significant difference in investment between the periods before and after decentralization, suggesting a substantial decline in foreign investment post-decentralization. For tax revenue as a percentage of GDP, the average difference between pre and post-periods was about 5.76, with a standard error of around 0.557. This implies a highly statistically significant difference in tax revenue between the periods before and after decentralization. There was a notable increase in tax revenues after the decentralization period.

In the case of GDP, the average difference between pre and post-decentralization was around -\$593 billion (negative value), with a standard error of about \$66.2 billion. This demonstrates a highly statistically significant difference in GDP between the periods before and after decentralization. There was a substantial decrease in GDP following decentralization. So, foreign Investment and Tax Revenue as a percentage of GDP exhibited statistically significant differences. Foreign investment decreased substantially, while tax revenue saw a significant increase after decentralization. Economic Growth and GDP did not show statistically significant changes. However, there was a significant decline in GDP after decentralization. Notably, statistically significant values do not imply causation but indicate meaningful differences observed between the two time periods. These findings underscore significant shifts in economic variables post-decentralization but do not establish direct cause-and-effect relationships.

Results. *The comparison of data regarding economic growth, tax revenues, and foreign investment is conducted between the pre-decentralization and post-decentralization periods in Indonesia.*

Figure 2 illustrates the annual data on economic growth rates, tax revenue growth, and foreign investment growth for the pre-decentralization period spanning from 1977 to 2000. This period signifies the era before the implementation of decentralization policies. On the other hand, Figure 3 showcases the corresponding

annual data for the post-decentralization period, encompassing the years 2001 to 2022. This period represents the phase after the enactment and execution of decentralization policies in the country. These figures enable a comparative analysis of the trends and variations in economic growth rates, tax revenue expansion, and foreign investment progression between the pre-decentralization and post-decentralization phases, offering insights into the effects of decentralization policies on these key economic indicators in Indonesia.

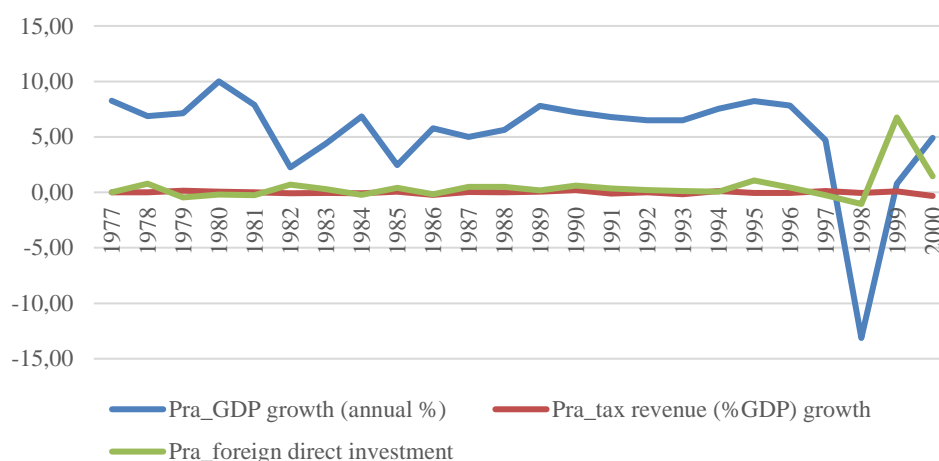


Figure 2. GDP growth, FDI growth, and tax revenue in 1977-2000 (Pre-decentralization)

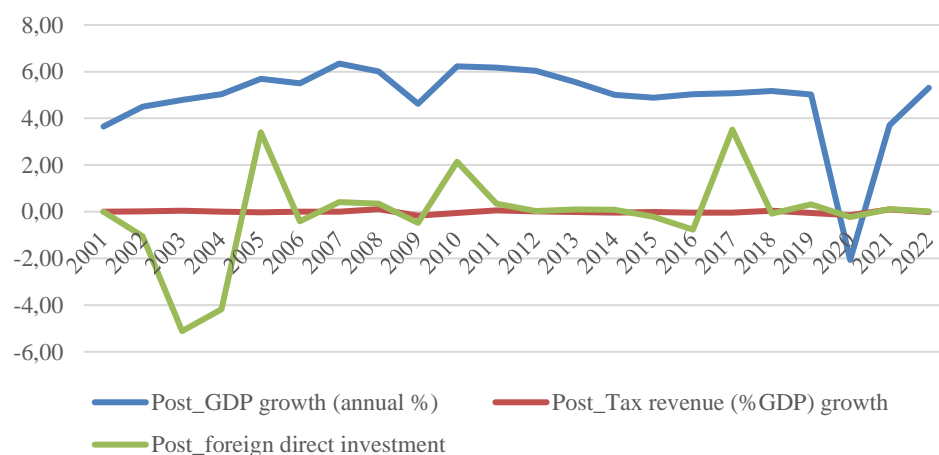


Figure 3. GDP growth, FDI growth, and tax revenue in 2001-2022 (Postdecentralization)

Figures 2 and 3 depict the dynamics of economic growth, tax revenue growth, and foreign investment growth spanning from 1977 to 2022, categorized into two distinct time frames: 1977-2000 (pre-decentralization) and 2001-2022 (post-decentralization).

During the pre-decentralization period, the average economic growth rates exhibited a range between 2% to 10%, showcasing notable fluctuations from year to year. Conversely, in the post-decentralization phase, there is discernible stability in economic growth levels, albeit with occasional minor fluctuations, which are not as

pronounced as observed in the pre-decentralization period. The Gross Domestic Product (GDP) growth in the pre-decentralization era showcased varied patterns, ranging from positive increases to significant declines, notably the notable recession in 1998, marked by a negative figure of -13.13%. In the post-decentralization period, there was a higher level of stability with more controlled fluctuations, despite some years exhibiting considerable changes.

In the pre-decentralization phase, the growth in tax revenues fluctuated significantly, alternating between increases and decreases annually. Conversely, during the post-decentralization period, there is a tendency towards smaller and more consistent fluctuations compared to the earlier period. Similarly, foreign investment growth during the pre-decentralization period depicted substantial annual fluctuations, notably experiencing a considerable downturn in 1998. In contrast, during the post-decentralization period, foreign investment exhibited fluctuations but with a relatively higher level of stability compared to the pre-decentralization phase. This analysis highlights the greater stability observed in these economic variables during the post-decentralization period, indicating the importance of consistent economic policies in fostering sustainable economic growth, although fluctuations persist.

Multiple Linear Regression Analysis. The application of multiple regression techniques is employed to evaluate the combined influence of decentralization, tax revenues, and foreign investment on economic growth variables. Additionally, this analysis aims to measure the extent to which these variables elucidate variations in economic growth, as outlined in the subsequent table:

Table 6. Regression Analysis

Parameter	Coefficient	Std. Error	t-statistic	P-value (P>t)
Intercept (_cons)	25.95775	0.694922	37.35	0
Decentralization	0.95479	0.279244	3.42	0.001
Tax Revenue (%GDP)	-0.0501124	0.0404658	-1.24	0.222
Foreign Investment	5.86E-11	1.24E-11	4.73	0
Number of obs				49
F(3, 45)				67.12
Prob > F				0
R-squared				0.8173
Adj R-squared				0.8052
MSE Root				5.13E-01

Source: Processed data, 2023

This Regression Analysis highlights the correlation between the dependent variable (Economic Growth) and three independent variables: Decentralization, Tax Revenue as a percentage of GDP, and Foreign Investment. The coefficient for the Decentralization dummy variable is 0.95479. This indicates that transitioning from "pre-decentralization" to "post-decentralization" conditions tends to increase the dependent variable by 0.95479 units. The low p-value (0.001) signifies a significant impact of this transition on economic growth within the regression model. The coefficient for Tax Revenue as a percentage of GDP is -0.0501124, suggesting a

negative relationship with the dependent variable. However, the high P-value (0.222) suggests that this variable might not significantly affect the model. Regarding Foreign Investment, the coefficient is 5.86E-11, indicating that a unit increase in Foreign Investment leads to a minute increase in the dependent variable. The low P-value (0) highlights the significant influence of this variable on the regression model. The F-statistic value is 67.12 with Prob > F of 0, indicating the overall significance of the regression model. With R-squared at 0.8173 and Adj R-squared at 0.8052, around 81.73% of the variation in the dependent variable is explained by the independent variables. Overall, this regression model effectively explains variations in the dependent variable with a high R-squared. Notably, Decentralization and Foreign Investment significantly influence Economic Growth, while Tax Revenue (%GDP) may not significantly impact this model.

Discussion. *Predecentralization and Postdecentralization Economic Growth.* Economic growth serves as an important indicator that reflects the cumulative value of goods and services produced in a country over a certain period. A comparative study of economic growth before and after the start of decentralization policies in Indonesia provides valuable insights into transformative changes in the economy. Before decentralization, Indonesia experienced economic growth ranging from 2% to 10%, although it was characterized by large fluctuations from year to year. Such varying growth rates indicate macroeconomic instability, which signals uncertainty and rapid fluctuations in economic performance. However, after the decentralization era, an important transformation occurred which was marked by increased consistency and stability of economic growth. Although fluctuations still occur, they are more regulated compared to the pre-decentralization phase. Post-decentralization economic policy changes have had a positive impact in encouraging stable economic growth. Differential analysis between these two periods shows that the post-decentralization phase shows a higher level of economic growth stability. Controlled fluctuations illustrate increased policy effectiveness, indicating a more consistent policy direction. Continuous and sustainable economic policies contribute to strengthening the balance and stability of post-decentralization economic growth. Therefore, comparing economic growth patterns before and after decentralization will show an increase in economic stability after the implementation of decentralization policies. This underscores the importance of maintaining coherent policies to ensure sustainable and resilient economic growth.

Tax Revenue as Percentage of GDP: Predecentralization vs. Postdecentralization. The evolution of tax revenues as a percentage of GDP in both the pre-decentralization and post-decentralization periods can be delineated as follows: During the pre-decentralization phase, tax revenues exhibited considerable fluctuations annually. This erratic pattern could be attributed to unsettled tax policies, shifts in economic strategies, and fluctuations in global economic conditions impacting revenue collection. The tax revenue systems before decentralization might have been less diversified and less efficient in tax collection due to limited resources and inadequate administrative infrastructure for effective monitoring and management. Contrastingly, in the post-decentralization era, tax revenues showcased

a trend toward increased stability. This shift can be attributed to enhancements in the tax structure, fortified fiscal policies, and advancements in tax administration. The post-decentralization period witnessed endeavors to refine tax collection methodologies and augment efficiency in tax monitoring and collection. Consequently, this led to an upsurge in tax revenues as a percentage of GDP.

Statistical analyses substantiate significant disparities in tax revenues between the pre-decentralization and post-decentralization periods, with a noteworthy increase in tax revenues following decentralization. In the regression model conducted, the Tax Revenue variable as a percentage of GDP exhibited a negative coefficient. However, the high P-value indicates that this variable might not exert a substantial influence on the regression model. This suggests that while there was an escalation in tax revenue post-decentralization, its impact on economic growth within the model might not be significant. These findings align with Kharisma's research in 2013, indicating that tax revenue's role, especially about regional taxes during the onset of decentralization, might not have stimulated economic growth. The decentralization era saw logical consequences, prompting the need to mobilize tax revenues from regions themselves through regional tax collection to fund regional government administration. In summary, the comparative analysis underscores a notable shift in tax revenue dynamics post-decentralization, implying the importance of improving tax structures and administration to fortify revenue generation, albeit with potential limitations regarding their direct impact on overall economic growth within the utilized model.

Foreign Direct Investment: Predecentralization vs. Postdecentralization in Indonesia. The divergence in foreign investment between the predecentralization era (1977-2000) and the postdecentralization phase (2001-2022) within Indonesia yielded striking disparities. Predecentralization witnessed significant fluctuations in foreign investment, marked by erratic variations annually. These fluctuations showcased periods of substantial upswings and drastic declines, indicating considerable volatility in foreign investment inflows. Investment trends were substantially swayed by prevailing global and local economic conditions. The economic crisis of 1997-1998 notably triggered a substantial decline in investment, significantly impacting Indonesia's foreign investment landscape. In the subsequent postdecentralization period, foreign investment exhibited a comparatively more stable trajectory in contrast to the volatile nature of the predecentralization era. Though fluctuations persisted, they were less pronounced than in the preceding period. Enhanced and sustained economic policies, particularly those enacted following the decentralization phase, seemingly fostered greater stability in attracting foreign investment. While global economic conditions continued to exert influence, relative stability characterized foreign investment during this phase.

The nexus between foreign investment and economic growth, especially through direct investment channels such as establishing factories or infrastructure projects, holds the potential to elevate production, employment, and overall economic output. Moreover, foreign investment often introduces new technology and innovation, enhancing production efficiency and domestic industrial competitiveness. Substantial

foreign investment can augment purchasing power, stimulating consumption and production growth. Additionally, it aids in diversifying the economy by bolstering sectors lacking adequate resources or capital for development. Regression analyses underscore a significant influence of Foreign Investment coefficients on economic growth within the utilized model. This highlights that alterations in foreign investment can indeed impact changes in economic growth. These findings align with Dunning's research in 2001, suggesting that decentralization empowered regional governments to craft policies attracting investments to their respective regions. Regional regulations were instrumental in luring investors to areas possessing economic potential, location advantages, natural resources, labor, and favorable socio-political conditions. The proactive role of regional governments in fostering an investment-friendly climate not only enhances local revenue but also stimulates overall economic growth at both regional and national levels. In summary, the comparative analysis delineates the substantial shift in foreign investment patterns post-decentralization, emphasizing the critical role of sustained economic policies and the proactive engagement of regional governments in bolstering investment climates, thereby propelling economic growth at multiple levels within Indonesia.

Conclusion. Analysis carried out on various indicators such as economic growth, tax revenues as a percentage of GDP, and foreign investment shows different trends before and after the decentralization period. Economic Growth shows significant variations and fluctuations throughout the observation period. After decentralization, a more consistent and stable growth trend emerged, reflecting the implementation of more assertive economic policies. However, statistical evidence that conclusively supports significant changes in economic growth after decentralization is still insufficient. Tax Revenue as a percentage of GDP shows considerable variation over the observed period. Notably, there was a substantial increase in tax revenues after decentralization, indicating a positive change in fiscal policy. However, the direct impact of this increase on economic growth requires further study, as the impact may not be statistically significant in the models used. Foreign Investment data shows significant fluctuations before decentralization. Despite the volatility, the post-decentralization period shows a relatively more stable foreign investment scenario. This suggests that post-decentralization policies contributed to the stabilization of foreign investment, although there was a substantial decline in foreign investment post-decentralization. Difference tests conducted between the pre-decentralization and post-decentralization periods corroborate significant differences, especially visible in the substantial decline in foreign investment and a significant increase in tax revenues after decentralization. However, regarding economic growth, these tests do not provide sufficient evidence to support statistically significant changes after decentralization. Multiple linear regression analysis highlights the significant influence of the variables Decentralization and Foreign Investment on Economic Growth. In contrast, Tax Revenue (% GDP) does not have a significant influence in this model. These results underscore the impact of decentralization and foreign investment on economic growth, warranting further investigation into the precise mechanisms behind this relationship. In summary, a

comparison between the pre-decentralization and post-decentralization periods highlights the increase in economic stability after decentralization. However, the direct and conclusive impact of these changes on economic growth remains uncertain. The increase in post-decentralization tax revenues indicates a positive change in fiscal policy, but its direct impact on economic growth needs to be studied in more depth. Moreover, the post-decentralization stabilization of foreign investment shows the effectiveness of policies in this area, despite a large decline in investment levels. More detailed analysis is needed to better understand the complex relationship between decentralization, fiscal policy, foreign investment, and their implications for sustainable economic growth.

Author contributions. The authors contributed equally.

Disclosure statement. The authors do not have any conflict of interest.

References:

1. Andrašić, J., Kalaš, B., Mirović, V., Milenković, N., & Pjanić, M. (2018). Econometric modeling of tax impact on economic growth: Panel evidence from OECD countries. *Economic Computation and Economic Cybernetics Studies and Research*, 52 (4), 211–226. <https://doi.org/10.24818/18423264/52.4.18.14>
2. Azwar, A. (2016). The Government's Allocative Role Through Procurement of Goods/Services and Its Influence on the Indonesian Economy. *Review of Economics and Finance*, 20 (2), 149–167. <https://doi.org/10.31685/kek.v20i2.186>
3. Dunning, P. J. H. (2001). Global Capitalism at Bay. In *Global Capitalism at Bay*. <https://doi.org/10.4324/9780203186039>
4. Hassan, A. A. (2022). Fiscal decentralization and economic growth were reconsidered. *International Journal of Research and Innovation in Social Science (IJRISS)*, VI (VIII), 64–70. <https://doi.org/10.1016/j.jue.2006.06.001>
5. Fiscal Indonesia, BK (2021). *FISCAL DECENTRALIZATION Two Decades of Implementation* (D. Puspita, M. Pahlevi, YM Raharja, S. Hadi, AL Baroto, AW Permana, & WT Rahayu (eds.)). Fiscal Policy Agency of the Ministry of Finance of the Republic of Indonesia.
6. Kharisma, B. (2013). Fiscal Decentralization and Economic Growth: Before and After the Era of Fiscal Decentralization in Indonesia. *Journal of Economics and Development Studies*, 14 (2), 101–119.
7. Kis-Katos, K., & Sjahrir, BS (2017). The impact of fiscal and political decentralization on local public investment in Indonesia. *Journal of Comparative Economics*, 45 (2), 344–365. <https://doi.org/10.1016/j.jce.2017.03.003>
8. Lamba, A., Allo, P.K., & Lamba, R.A. (2019). Effect of fiscal decentralization policy of regional economic imbalances towards economic growth in Eastern Indonesia. *International Journal of Social Sciences and Humanities*, 3 (2), 112–127. <https://doi.org/10.29332/ijssh.v3n2.298>
9. Manasseh, CO, Nwakoby, IC, Okanya, OC, Nwonye, NG, Odidi, O., Thaddeus, KJ, Ede, KK, & Nzidee, W. (2023). Impact of digital financial innovation on financial system development in Common Market for Eastern and Southern Africa (COMESA) countries. *Asian Journal of Economics and Banking*. <https://doi.org/10.1108/ajeb-04-2022-0041>
10. Martinez-Vazquez, J., Lago-Peñas, S., & Sacchi, A. (2017). the Impact of Fiscal Decentralization: a Survey. *Journal of Economic Surveys*, 31 (4), 1095–1129. <https://doi.org/10.1111/joes.12182>
11. Melani Hutajulu, D., Lukis Panjawa, J., Sari Islami, F., & Retno Sugiharti, R. (2020). Determinants of sustainable economic growth in the parent region and expansion in eastern Indonesia. *Journal of Economics and Business*, 23 (October), 263–284.
12. Musgrave, R.A., & Musgrave, P. b. (1989). Public Finance in Theory and Practice. In *Mc Graw-hill, Inc. All rights reserved*. <https://doi.org/10.1515/1553-3832.1898>
13. N. Mohs, DJ, Wnek JD, R., & Galloway, A. (2018). The Impact of Taxes on Foreign Direct Investments. *International Journal of Accounting and Taxation*, 6 (2), 54–63. <https://doi.org/10.15640/ijat.v6n2a6>
14. Pepinsky, TB, & Wihardja, MM (2011). Decentralization and economic performance in Indonesia. *Journal of East Asian Studies*, 11 (3), 337–371. <https://doi.org/10.1017/S1598240800007372>
15. Rondinelli, D. A. (1981). Government Decentralization in Comparative Perspective: Theory and Practice in Developing Countries. *International Review of Administrative Sciences*, 47 (2), 133–145. <https://doi.org/10.1177/002085238004700205>
16. Rondinelli, D. A., Nellis, J. R., & Cheema, G. S. (1983). Decentralization in Developing Countries. In *The International Bank for Reconstruction and Development/The World Bank* (Issue 581). <https://doi.org/10.1201/noe1420052756.ch96>
17. Sholikin, A. (2018). *Regional Autonomy in Petroleum Management*. XV (1).
18. Sodik, J., Sarungu, J., Soesilo, A., & Tri Rahayu, SA (2019). The determinants of foreign direct investment across Provinces in Indonesia: The role of market size, resources, and competitiveness. *Malaysian Economic Journal*, 53 (3). <https://doi.org/10.17576/JEM-2019-5303-11>

19. Talitha, T., Firman, T., & Hudalah, D. (2020). Welcoming twenty decades of decentralization in Indonesia: a regional development perspective. *Territory, Politics, Governance*, 8 (5), 690–708. <https://doi.org/10.1080/21622671.2019.1601595>
20. Todaro, M. P., & Smith, S. C. (2011). *Economic Development in the Third World*. Pearson Education, Inc., Rights and Contracts Department, 501 Boylston Street, Suite 900, Boston.
21. Trisakti, F., & Djajasinga, N. (2021). Impact of Decentralization and Regional Autonomy in the Context of Improving the Quality of Public Services Towards Good Governance. *Proceedings of the 2nd Annual Conference on Blended Learning, Educational Technology, and Innovation (ACBLETI 2020)*, 560 (Acbleti 2020), 49–53. <https://doi.org/10.2991/assehr.k.210615.010>