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Original Article

The Role of Economic Growth, Income Inequality, and Social Assistance in Shaping Poverty Dynamics in Central Java

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Abstract

Poverty remains a development challenge, particularly those with low economic growth and poorly distributed social welfare. Despite high economic growth, poverty reduction often remains uneven, demonstrating the complex interactions between growth, income distribution, labor market conditions, and the social assistance safety net. This study aims to examine the factors influencing poverty, their relationship to economic growth, income inequality, unemployment, and the social assistance safety net in Central Java. Using a quantitative panel data methodology, this study analyses data on the variables used from 2019 to 2023. A fixed effects model with robust standard errors is used to consistently and effectively estimate the relationship between the determinants of poverty. The results of this study indicate that economic growth, particularly GDP, can significantly reduce poverty. Then income inequality also significantly influences poverty dynamics. Social assistance is positively related to poverty, meaning it effectively serves as a tool to help people avoid falling into poverty. Meanwhile, unemployment has an insignificant impact on poverty. It follows from the above that the poverty-reduction strategy in Central Java should not be oriented solely to the growth path but should be coupled with tax reform integrated into social assistance packages to improve targeting efficiency and sustainability.

Keywords: Economic Growth, Income Inequality, Poverty, Social Assistance, Unemployment.

1. Introduction

Poverty is a significant barrier to the economic development of an individual country. Addressing poverty is a significant challenge for most countries, as it reflects economic constraints and is linked to quality of life and social welfare (Liu et al., 2020; Sen, 1999). According to the capability approach, poverty is a result of people not having sufficient freedom and ability to live a life they have reason to value, or what most people would agree is a good life (Sen, 1999). Accordingly, poverty is not only to be considered a condition of having an income lower than the poverty threshold, but also as a multidimensional condition indicating having lack of access to the education, health, basic services, quality of social life, and being under the influence of the structural economic and social arrangements (Alkire & Foster, 2011; Liu et al., 2020; Ward, 2016).

In fact, some countries in Southeast Asia have achieved remarkable reductions in poverty over the last three decades, accompanied by sustained economic growth and structural transformation (Warr, 2006). Poverty reduction in Indonesia is typically linked to the structural shift of the economy away from agriculture toward the more productive industrial and service sectors (Cameron, 2000). However, this issue has not been fully inclusive and sustainable. Indonesia continues to have one of the largest poor populations in Southeast Asia,

posing poverty as a significant challenge to the national development agenda, particularly in meeting the Sustainable Development Goals (SDGs) of eradicating poverty by 2030, the World Bank (2025) stated.

Data from the Central Statistics Agency BPS (2020) shows that Central Java Province ranks third in terms of poverty rate in Indonesia after West Java and East Java. The province's poverty rate reached 10.77 percent, exceeding the national average of 9.03 percent. Over the past five years, from 2019 to 2024, the poverty rate in Central Java has tended to decline, with increases only occurring during the COVID-19 pandemic. Although the poverty rate in Central Java is higher than the national average, its economic growth rate, according to Rusdarti & Sebayang (2013), is projected to exceed Indonesia's economic growth. This indicates that the province's strong economic growth is primarily due to increased investment through several new industrial areas and the effectiveness of existing policies (Sulistiawan, 2023).

In addition to its high poverty rate, Central Java is also characterized by significant socioeconomic diversity (Agustina et al., 2025). This diversity is evident in several aspects, including the economy, access to services, infrastructure, urbanization rates, and the quality of its human resources. According to Mahrina et al. (2022) regions dependent on the agricultural sector and low-productivity economic activities often experience higher poverty rates, especially compared to regions based on industry or high-value-added activities. This underscores the importance of regional economic structure in poverty reduction efforts.

Dollar et al. (2016) state that the goal of regional income growth is to increase revenue sources while creating more job opportunities for the community. Although economic growth is crucial for poverty reduction, the relationship is not straightforward. It depends heavily on the nature of economic growth, labor market conditions, and income distribution (Cerra et al., 2021). Poor communities face challenges that cannot be addressed solely through market mechanisms (Fiszbein et al., 2014). Several measures can be implemented by the government to address extreme poverty, particularly in extreme poverty, such as social protection. These social protection measures serve, among other things, as a safety net and can protect poor households' consumption. Furthermore, Ngubane et al. (2023) state that this assistance can reduce their vulnerability to income declines and price fluctuations in the market. However, it should be emphasized that the effectiveness of government social assistance programs depends heavily on several factors, including accurate targeting, broad and comprehensive coverage, and integration with other development policies to avoid overlap.

Several studies have been conducted to examine the factors influencing poverty, including economic growth, social assistance, and labor market conditions, including unemployment. However, most existing studies analyze these factors in isolation, offering descriptive insights that often fail to capture the complex, multi-dimensional nature of poverty across different regions. Furthermore, empirical research that simultaneously tests the impact of regional income (such as GDP per capita), unemployment, and social assistance on poverty levels remains limited. Given this situation, this study aims to fill this gap by investigating the factors influencing poverty levels in Central Java Province.

This analysis focuses on three main factors: regional income (GDP), which indicates an area's economic capacity; labor market conditions (unemployment rate), which show how well the economy provides jobs and income; and social assistance programs, which reflect government efforts to protect poor households from vulnerability and income shocks (Pertiwi & Islami, 2022). The use of panel data from various cities and regencies in Central Java is expected to provide a more empirical and comprehensive understanding of the determinants of poverty at the regional level. Furthermore, the findings of this study are expected to

contribute to the existing literature on regional economics. Primarily, they can serve as a guide for developing more effective, inclusive, and sustainable regional development policies.

2. Literature Review

Numerous existing studies, both theoretical and empirical, demonstrate that poverty is significantly influenced by a combination of economic and non-economic factors. These two factors are formed by existing institutions and market systems. Ravallion (2012) argues that poverty reduction efforts cannot be achieved solely by looking at economic growth. This can be due to an unfair and inclusive income distribution, leaving many low-income and marginalized groups or communities behind. Similarly, Fields (2011) adds that how a community's income is distributed significantly influences the extent to which economic growth can improve social welfare. This perspective highlights that the role of or efforts to reduce poverty in a region is not solely the result of overall economic growth. Rather, it depends heavily on how the benefits of economic growth are shared among various groups within the broader community. In the literature on regional development, economic growth is often measured by regional gross domestic product (GDP). GDP represents the productive capacity measured by a region's income, reflecting the income of its population. Several studies, including one by Rusdarti & Sebayang (2013) have found a negative relationship between GDP and poverty.

This study shows that GDP growth can reduce poverty, meaning higher regional economic growth can improve the well-being of communities and households. More recent evidence from Sulistiawan (2023) further supports this result, finding a negative and statistically significant impact of GRDP per capita on poverty at the district and city levels. Nonetheless, the poverty-reduction effect of GRDP growth is also qualified by the sectoral pattern of growth and its capacity to generate employment, particularly for the urban poor. Beyond economic growth, social assistance and social protection policies constitute necessary non-market instruments for poverty reduction. Social aid schemes, such as food subsidies, cash transfers, and other non-contributory schemes, are aimed at shielding poor and vulnerable families from shocks with economic, social, or health dimensions.

World Bank (2020) states that a properly targeted social protection system can reduce extreme poverty by 20-30 percentage points. The effect of social aid on poverty, at least in Indonesia, appears to be supported by the empirical work of Arfandi & Sumiyarti (2022). Adrianto et al. (2020) states that the poverty trap is a phenomenon that is vulnerable to poor communities, therefore, a safety net is needed, one of which is social assistance. However, the social assistance provided has not had a significant impact on poverty reduction, especially in the long term. This is the reason why, without follow-up measures, such as community economic empowerment, social assistance will be futile because its impact is only short-term. Social assistance only serves to protect and stabilize structural poverty rather than providing comprehensive improvements.

Another factor that plays a significant role in poverty is income inequality. It is important to note that poverty is measured only by examining people with incomes below the poverty line. Other factors, such as income inequality, are not examined in more detail. If inequality levels are high, it can weaken the effect of growth on poverty reduction. This is because income increases are skewed only towards wealthier groups. Studies by Firdaus et al. (2021) and Manalu et al. (2024) show that higher income inequality is associated with higher poverty rates.

Another factor influencing poverty dynamics is the labor market. The size of the labor market itself is usually measured by the regional unemployment rate. Todaro & Smith (2020) state that structural unemployment is a leading cause of poverty in developing nations because the labor market is unable to absorb all those seeking work. Cholili (2014) state that unemployment leads to an immediate deprivation of income and basic needs, thereby increasing the risk of poverty. Consistent with this opinion, at the regional scale, rising poverty and unemployment are significantly (Azizah et al., 2024; Sulistiawan, 2023). Nevertheless, several studies argue that in areas where informality is predominant, open unemployment is a weak indicator of economic hardship because many people hold jobs that do not provide sufficient income to exit poverty.

In sum, the literature suggests that poverty is a multidimensional problem shaped by economic growth, income distribution, labor market status, and social protection measures. These results are well grounded theoretically in the study of the dynamics of poverty in Central Java, with GRDP, income inequality, unemployment, and social assistance as significant, arguably major, explanatory variables. While these factors are well-studied individually, few studies examine their simultaneous effect in a single regional model, particularly in a socio-economically diverse province like Central Java. Moreover, the interaction between growth, unemployment, and social assistance in the context of decentralization and district-level panel data remains under-explored. The purpose of this research is to expand the body of research on regional poverty reduction efforts by addressing this gap. It can also serve as a reference for the government in its efforts to reduce poverty through effective, inclusive, and sustainable policies.

3. Methods

This study employs quantitative methods, utilizing panel data from 35 regencies and cities in Central Java Province. By including all administrative regions in the province, this study aims to provide a more spatially representative study area due to the more comprehensive data collection. This also serves to avoid sampling bias. Furthermore, the dataset used covers a five-year period, from 2019 to 2023. This five-year period is considered sufficient to observe any trends or temporal changes in the short to medium term. Therefore, the results obtained using panel data will be more balanced. Furthermore, it can also allow for consistent comparisons across all regencies and cities in Central Java Province over time. Furthermore, this study will also produce results that can be used to examine various social and economic conditions that occur or are found in Central Java.

In this study, quantitative indicators sourced from secondary data serve as measuring tools. These data are collected through official data and released on the website of the Central Statistics Agency (BPS). Several indicators mentioned above are used as factors that influence the dimensions of poverty that occur in Central Java, including economic growth, unemployment in the labor market, income distribution, and the importance of regional assistance policies as a form of protection or safety net. These variables include: (1) Poverty Level indicates the proportion of the population living below the official poverty line expressed as a percentage; (2) Regional Gross Domestic Product (GDP), acting as a proxy for earned income and regional economic output; (3) Social Food Assistance to capture proportional effects and minimize scale bias, expressed in logarithmic form; (4) Open Unemployment Rate reflects labor market conditions in a region expressed as a percentage; and (5) Gini Ratio, which measures income inequality or inequality within a district or city.

The data used in this study is sourced from official secondary data from the national reports of the Central Statistics Agency (BPS). This dataset, consisting of district/city data for five years, from 2019 to 2023, is a cross-sectoral panel. Furthermore, the data is a combination of two elements: time series data and cross-sectoral data. Both combinations can be used to capture temporal and spatial variation. The official data used from BPS has certainly undergone a standardization process, allowing for more meaningful comparisons between regions. The use of accurate and standardized data will ultimately result in robust panel data analysis.

Panel data econometric methods were used for data analysis to address unobserved differences across time and regions. Model specification tests were initially conducted to identify the most appropriate estimation method for the study. Furthermore, two tests were used to evaluate whether the panel estimator offers greater efficiency than the combined OLS model: the Chow test and the Lagrange multiplier (LM) test (Hair et al., 2017). Furthermore, the Hausman test was used to decide between the FE and RE models. The test results indicated that the fixed effects model was the most appropriate. Furthermore, to confirm the reliability of the estimation results, a series of classical assumption tests were conducted. The Kolmogorov-Smirnov test for normality, the variance inflation factor (VIF) for multicollinearity, the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity, and the Wooldridge test for serial correlation. The diagnostic tests pointed to heteroskedasticity, so robust standard errors were employed in the final estimation to guarantee the correctness of statistical inferences and the consistency of Best Linear Unbiased Estimator (BLUE) properties.

4. Results and Discussion

4.1. Research Results

Table 1. Fixed Effect Regression with Robust Estimation

Dependent variable: Poverty rate	
Independent variables	Coefficient (Standard Error)
Ln social food assistance	-0.1273185* (0.0720964)
Ln gross regional domestic product	-10.53543*** (0.8257844)
Open unemployment rate	-0.058685 (0,06204)
Gini ratio	0.0191952*** (0.0047042)
Number of observations	111
R^2 within	0.7557

Source: Proceed by the author, 2025

Table 1 shows the results of the fixed-effects regression, estimated with robust standard errors (N = 111). The R^2 of 0.7557 indicates that 75.57% of the variation in temporal poverty across regions is explained by the independent variables, which is very high, whereas cross-regional variation is relatively small. The F-test statistic is 56.97 ($p < 0.0000$), confirming that the overall effect of the regressors on poverty is significant. At the household and provincial levels, GRDP is also highly negative and statistically significant at the 1% level, indicating that growth substantially reduces poverty. Specifically, a 1% increase in regional gross domestic product GRDP is associated with a 10.54% reduction in poverty. The 1% significant positive coefficient on the Gini ratio indicates that higher income inequality is associated with a higher

poverty headcount. More specifically, a 1% increase in the Gini coefficient raises the poverty rate by 0.0192%.

Social food assistance is negatively related to poverty. It is very weakly significant at the 10% level, implying that support can alleviate the situation to some extent, but that's probably all one can say in general. The study found that every 1% increase in social food assistance significantly correlated with a 0.13 percentage point decrease in poverty rates. Conversely, no statistically significant correlation was found for open unemployment and poverty in Central Java. This suggests that specific labour market characteristics are not the only factor considered when evaluating households' vulnerability to poverty. Overall, this study underscores the importance of promoting more inclusive and sustainable economic growth, addressing income inequality and ultimately increasing the effectiveness of government social assistance initiatives, with the goal of reducing poverty through sustainable policies.

Table 2. Model Selection Test

Model Selection Test	Value	Model Selected
Chow Test	Rho 0.98715432	Fixed Effect
Lagrangian Multiplier Test	Chibar2 100.30***	Random/Fixed Effect
Hausman Test	Chi2 127.08***	Fixed effect

Source: Proceed by the author, 2025

Table 2 shows that the model selection strongly supports the fixed effects specification. The Chow test shows a rho value of 0.987. This value supports the choice of a fixed effects model over the use of combined OLS. Furthermore, the Lagrangian Multiplier (LM) test yields a chi-square (χ^2) statistic of 100.30, which is highly significant. This indicates that the panel estimators, both fixed and random effects, are more appropriate than pooled OLS.

To discern between the two, the Hausman test produces a Chi^2 statistic of 127.08, significant at the 1 percent level, decisively rejecting the random effects model and affirming the appropriateness of fixed effects. Collectively, the evidence consistently identifies the fixed effects model as the most suitable specification, aligning with the outcomes of both the Chow test and the Hausman test.

Table 3. Classical Assumption Test

Classical Assumption test	Value	Fixed Effect	Fixed Effect Robust
One-sample Kolmogorov-Smirnov test against theoretical distribution	Combined K-S 0.1014 (P-value 0.204)	Normal residual	Normal residual
Mean VIF	1.13	Non multicollinearity	Non multicollinearity
Breusch-Pagan / Cook-Weisberg test for heteroscedasticity	Chi2 11.41 (Prob chi2 0.0007)	Heteroscedasticity	Homoscedasticity
Woolridge test for autocorrelation in panel data	F 0.381 (Prob F 0.5410)	Non autocorrelation	Non autocorrelation

Source: Proceed by the author, 2025

The classical assumption test presented in Table 3 indicates that the residuals of the fixed effects model satisfy most of the requisite criteria. The one-sample Kolmogorov-Smirnov test result resembled the statistic of 0.1014 with a 0.204 p-value, and so the null hypothesis of

residual normality was not rejected. The multicollinearity problem is not serious as the mean VIF value is 1.13, which is less than the accepted cut-off value. In addition, the Wooldridge test for autocorrelation in panel data was F (1,9) = 0.381, p 0, 541 indicating that serial correlation is not present. However, the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity was significant with a $\chi 2$ value of 11.41 and a p-value = 0.0007, suggesting the presence of heteroscedasticity. To deal with this problem and to maintain the consistency of the estimation results, we re-estimated the fixed effects model using robust standard errors.

The results of the model selection test (Table 2) show that the Fixed Effect (FE) model is the most appropriate specification for analysing the determinants of poverty in districts/cities of Central Java during the 2019–2023 period. This is supported by the results of the Chow test and Hausman test, both of which are significant at the 1% level, thus rejecting the Random Effect and Pooled OLS models. These findings indicate the existence of unique regional characteristics (time-invariant effect) that influence poverty, such as differences in fiscal capacity, local economic structure, and the effectiveness of social programs.

Meanwhile, the results of the classical assumption test in Table 3 show that the model meets most of the BLUE criteria. The average VIF value of 1.13 indicates the absence of multicollinearity, while the Wooldridge test shows no autocorrelation (p-value 0.541). Although there is evidence of heteroskedasticity according to the Breusch-Pagan test (p=0.0007), this issue has been addressed using robust standard errors, so the estimation results remain reliable for interpretation.

4.2. Discussion

4.2.1. The Effect of GRDP on Poverty Levels

The results of this study indicate that the Regional Gross Domestic Product (GDP) coefficient has a negative and significant value of 1% in poverty reduction efforts. This indicates that economic growth plays a significant role in reducing poverty in Central Java, although its effect is not automatic or direct. Specifically, every 1% increase in GDP can reduce the poverty rate by up to 10.54%. This substantial figure highlights the strong impact of regional economic growth on poverty reduction in Central Java. This finding is consistent with the trickle-down effect theory, which suggests that economic growth causes job creation, household income, and welfare across income groups (Smith & Todaro, 2020).

This finding is also in line with other empirical studies, such as Rusdarti & Sebayang (2013) and Sulistiawan (2023) who found that GRDP can reduce poverty at least significantly and negatively both at the level of provinces or districts/cities in Indonesia. The relatively stable economic growth of approximately 5% per year in Central Java suggests that growth has begun to lift a portion of the population out of poverty. The GRDP growth rate, however, coupled with its uneven spatial and sectoral distribution, seems to imply that its effects on poverty reduction generated are inclusively unbalanced.

Economic growth in Central Java has been heavily concentrated in manufacturing activities, urban-based services, and industrial clusters, especially around the northern coastal areas as well as in the metropolitan regions. On the other hand, a slower pace of productivity improvements and weaker income gains have characterized the agricultural and informal sectors, which employ a large fraction of the poor. This pattern suggests that growth, although effective at reducing aggregated poverty, is biased towards certain regions and sectors and therefore ultimately ineffective in reducing poverty amongst rural and informal workers. Therefore, it could be said that promoting rapid economic growth alone might not be adequate for enduring poverty reduction unless energy is also focused on formulating and

implementing policies to raise labor absorption/pop without accompanying sectoral disarticulation.

4.2.2. The Influence of Income Inequality (Gini Ratio) on Poverty

The estimated results indicate that the Gini Ratio has a positive effect on poverty, which is statistically significant, with an elasticity of approximately 0.0192. This means that a 1% increase in income inequality is associated with a 0.0192% increase in the poverty headcount, thereby reconfirming that rising income inequality hampers poverty reduction. This result is in line with Ravallion (2016) and Fields (2011) who argue that the higher the growth, the lower the ability of growth to 'trickle down' to low-income groups.

Although the Gini Ratio in Central Java remains comparatively low compared to the national average, between 0.36 and 0.37, the concurrent rising inequality within the province also implies the existence of vast disparities across regions within it. The rapid growth of cities such as Semarang and Surakarta is in sharp contrast to stagnation and decline in southern and western rural areas that are largely reliant on subsistence farming.

Consequently, the returns to economic growth are skewed away from the poor and thus have little effect on poverty alleviation in the underdeveloped regions. These results suggest that inequality is a structural constraint that prevents poor households from engaging in and benefiting from economic growth. Even where regions are growing, an unequal distribution of education, productive work, and infrastructure can encourage poverty traps. Therefore, to reduce poverty, policies that encourage income redistribution are needed. This can be achieved through various policies, including inclusive labor market policies, equal access to economic opportunities, and rural development.

4.2.3. The Influence of Social Assistance on Poverty

Based on empirical estimates in this study, it is shown that food-based social assistance negatively impacts the poverty rate by approximately 10 percent, with a coefficient of approximately 0.13. Every 1% increase in the value of government social assistance can reduce the number of poor people by 0.13 percent. Although the impact is relatively small in percentage terms, the negative correlation between these two factors underscores the importance of social protection in poverty reduction efforts. This social assistance plays a crucial role in protecting vulnerable households from falling into extreme poverty when their incomes decline. It is important to remember that this social assistance is not permanent and only acts as a supplementary tool for the poor to purchase essential consumer goods and can also help generate additional income.

According to Adrianto et al. (2020) the effectiveness of social assistance largely depends on precise targeting, adequate benefits, and consistent implementation. However, in practice, inconsistencies in targeting data undermine the potential of this intervention, particularly regarding its long-term impact on poverty reduction. Inconsistencies in recipient lists and aid distribution schemes in Central Java exacerbate this problem. As a result, some vulnerable households who should receive assistance may be missed, while others receive benefits despite not being the most in need (Arfandi & Sumiyarti, 2022). This challenge highlights that optimizing social assistance requires several factors, including an integrated beneficiary database, a digital-based monitoring system, and effective coordination between assistance providers. Improvements in these areas will enable more accurate targeting, so that social assistance can have a more sustainable impact in reducing poverty.

4.2.4. The Influence of Unemployment on Poverty

The estimation results indicate that the open unemployment rate has no significant effect on poverty in Central Java. This finding illustrates the structural nature of the regional labor market, in which most of the population works in the informal sector or as farmers on their own land. People employed in low-productivity and low-income sectors are frequently not considered to be unemployed, although they are economically vulnerable. This means that open unemployment is not the principal source of poverty in Central Java, but poor quality of jobs, including underemployment, informal work arrangements, and low wages.

Therefore, the open unemployment rate may understate the actual level of labor market precariousness among poor households. A similar line of argument has been put forth by Cholili (2014) and Azizah et al. (2024), who state that, in developing countries, it is more important to be engaged in informal employment or low-paying jobs than to be unemployed to avoid poverty. These results suggest that focusing on reducing open unemployment may have a limited impact on poverty reduction. Instead, increases in labor productivity, job quality, and wages, particularly in the agricultural and informal sectors, may offer greater potential for reducing poverty.

5. Conclusion

The findings of this study reveal that poverty in Central Java stems from a complex process influenced by various factors. This is because poverty is a multidimensional problem that requires sustained efforts to address. Several factors influence poverty reduction efforts, including economic growth, income distribution, and social support. FGLS estimates indicate that regional economic progress in Central Java, as indicated by Regional Gross Domestic Product (GRDP), plays a crucial role in poverty reduction. This highlights the impact on the poor, including efforts to increase their incomes. However, the relationship between growth and poverty reduction is not straightforward and automatic. The role of economic growth can be significantly weakened if there is increasing income inequality across population groups in various regions. This can hinder the distribution of the benefits of economic growth across regions and population groups.

Furthermore, the results show that income inequality can exacerbate poverty dynamics. This supports the warning that increasing inequality in income distribution can hinder improvements in average welfare. Conversely, one factor in the labor market, the open unemployment rate, was not significant. This suggests that poverty in Central Java is more closely related to informal sector labor and low-quality jobs than to unemployment itself. Meanwhile, the population safety net scheme in the form of social assistance appears to be designed to play a reactive role with the aim of improving welfare. However, because it is reactive, its role is weak in reducing people's vulnerability to poverty. However, such assistance policies are necessary for sustainable poverty reduction.

These findings suggest that poverty alleviation policies in Central Java must be designed and directed toward fostering a broader economic growth environment, primarily to ensure equitable income distribution, so that the impact is felt by the wider community. Social assistance programs must also be made more effective and efficient. This can be achieved by ensuring that recipients, specifically the poor, are accurately targeted. Furthermore, better coordination is needed for digital use and utilization. The goal is to empower the wider community economically, for example through job training or capital financing. Furthermore, structural reforms to the available labor market are necessary to align with company needs.

Therefore, efforts must be made to align regional GDP growth with productive job creation and poverty reduction.

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