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ASSESSING THE ROLE OF WORKFORCE PARTICIPATION, POPULATION SIZE, AND HUMAN DEVELOPMENT IN SHAPING POVERTY IN INDONESIA (2019–2024)

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Abstract
This study is intended to analyze TPAK, Population, and HDI on poverty in Indonesia during the 2019–2024 period. Poverty is understood as a multidimensional phenomenon in economic, social, and human development aspects. This study uses a quantitative descriptive approach with a panel data regression analysis method for 34 provinces in Indonesia. The results of data processing showed that partially, TPAK had a positive and significant effect on poverty, which means that increasing labor participation does not necessarily reduce poverty, especially if it is not accompanied by adequate quality of work. The population variable did not have a significant effect, indicating that population size was not the main factor in explaining the variation in poverty between regions. Meanwhile, HDI shows a negative and significant influence on poverty, which proves that the higher the quality of human development, the lower the poverty rate. These findings support Ragnar Nurkse's (1953) theory of the poverty circle, which states that human resource underdevelopment and low productivity are the root causes of recurring poverty. This study recommends that poverty alleviation efforts be focused on improving the quality of human resources and creating productive jobs.

Keywords: TPAK, Population, HDI, Poverty

1. Introduction

Poverty is a complex issue that spans multiple dimensions and remains an important focus on the global development agenda, especially in developing countries such as Indonesia. Although many strategies have been implemented to reduce poverty, the reality shows that a large number of people still struggle to meet their basic needs. This phenomenon not only reflects limited access to education, health, and employment, but also illustrates inequality in income distribution that further widens social disparities. (Ningrum, 2017)

Poverty is still a major issue in Indonesia's national development, although there has been a statistical decline. Reality shows that this problem still infects many levels of society, especially in rural areas and disadvantaged areas. Inequality in development and income distribution are structural factors that affect the persistence of poverty in Indonesia. (Dewantari, 2021)

Based on the definition from the Central Statistics Agency (BPS), poverty refers to a situation when individuals or households are unable to meet basic needs such as food, shelter, education, and health services as measured using monthly per capita expenditure indicators. This condition is exacerbated by low income and high unemployment which directly reduces people's purchasing power. In a broader context, poverty is an interrelated social and economic phenomenon, including lack of access to employment, education, health, and low levels of wages and labor productivity (Tambunan, 2009).

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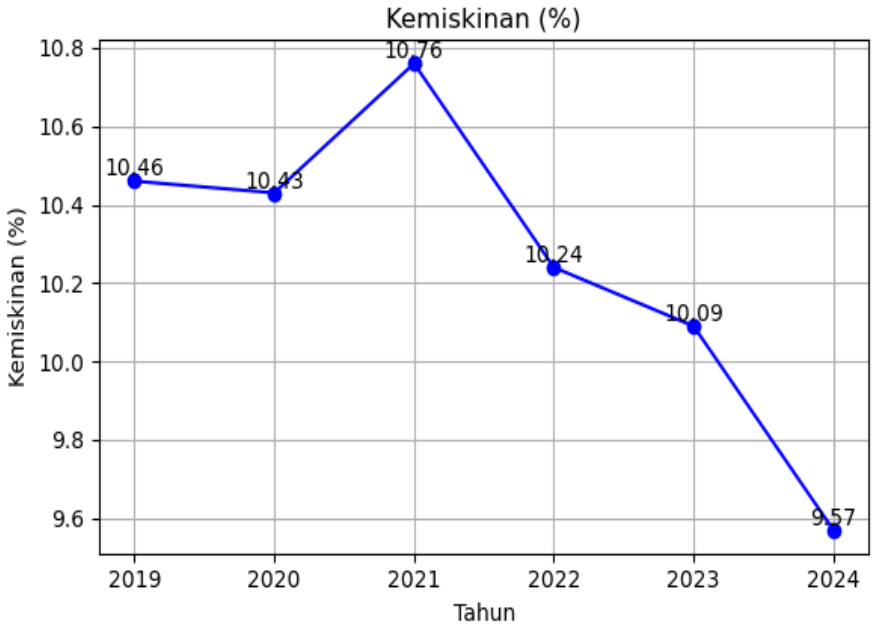

Figure 1. Poverty Rate in Indonesia (2019-2024)

The graph above shows that the poverty rate in Indonesia fluctuated during the 2019–2024 period. In 2019–2020, the percentage was relatively stable in the range of 10.4%. However, there was a surge in 2021 to 10.76% due to the impact of the COVID-19 pandemic. After that, poverty continues to decline gradually until it reaches a low of 9.57% in 2024. This downward trend reflects the national economic recovery and the effectiveness of various poverty alleviation policies.

Poverty in Indonesia is also greatly influenced by population structure. Population growth that is not balanced with job creation will increase the country's economic burden. A large population can become development capital if supported by the quality of qualified human resources (HR). However, if the quality is low, it will become a burden in the development process. In many areas, the poor are generally in rural areas with limited access to education, health services, and basic infrastructure. (Idris, 2016) (Nurwati, 2008)

Another factor that also affects the poverty rate is the Labor Force Participation Rate (TPAK). The higher the participation of the labor force, the greater the potential for people to be involved in the production process of goods and services that support economic growth. However, high TPAK does not necessarily mean poverty reduction, especially if it is not supported by the quality of available jobs. Informal jobs, low wages, and lack of social protection can actually worsen household economic conditions. (Erfiana et al., 2025)

Furthermore, the Human Development Index (HDI) is an important indicator in measuring the quality of social development. HDI combines three main dimensions, namely life expectancy, education level, and per capita income. Areas with high HDI tend to have lower poverty rates because their people have better access to education and health and stronger economic capacity. However, there is still inequality in HDI between regions, which also increases the poverty gap. (Sitanggang, 2020) (Mukhtar et al., 2019)

In recent years, a number of studies have highlighted the importance of the variables Unemployment Rate, Inflation, and Human Development Index in influencing poverty rates. found that TPAK has a negative and significant effect on poverty in West Sumatra Province. This is because increased labor force participation provides greater access to

jobs and income, thus helping people meet their basic needs. Similar findings were conveyed by Humbang Hasundutan Regency, where TPAK was proven to significantly reduce poverty rates, while HDI and economic growth were insignificant. In contrast, in North Sumatra Province, it was found that HDI had a significant negative effect on poverty, but TPAK did not show a significant effect, indicating the need for further study on the consistency of the impact of TPAK between regions. Meanwhile, it found a positive and significant relationship between HDI and poverty in the Riau Islands, an unusual finding and indicates the possibility of an uneven distribution of human development benefits.

Instead, it found that HDI has a significant negative effect on poverty, in line with the theory that improving the quality of life reduces the risk of poverty. Regarding the population variables, although not much has been studied specifically, studies show that the increase in the population contributes positively to poverty, because population growth that is not balanced with increased employment opportunities and the quality of human resources can increase economic and social burdens. In general, these results show that TPAK and HDI tend to reduce poverty, while the number of people has the potential to increase poverty if it is not accompanied by appropriate and inclusive development planning. (Triani, 2024) (Sihite et al., 2024) (Matondang et al., 2024) (Suganda et al., 2024) (Prasetyoningrum & Sukmawati, 2018) (Ashari & Athoillah, 2023)

Based on this description, it is clear that variables such as the Unemployment Rate, inflation, and the human development index are closely related to the poverty rate. Therefore, it is necessary to conduct further research that empirically examines the influence of these three variables on poverty in Indonesia, especially in the 2019–2024 period. This research is expected to be a consideration in formulating sustainable and equitable socio-economic development policies.

2. Theoretical Background

This research is based on the poverty circle theory by Ragnar Nurkse (1953). According to this theory, poverty is the result of continuous reinforcement of backwardness, low quality of human resources, limited capital, imperfect markets, and low productivity causing low community income. Low-income results in low savings and investment, so the job creation process is limited. (Kattel et al., 2011)

A number of empirical studies support the relevance of this theory. For example, TPAK has a negative and significant influence on poverty, meaning that the more people involved in economic activities, the greater the chance of increasing income and breaking the cycle of poverty. Similarly, it was found that the increase in TPAK in Humbang Hasundutan Regency made a real contribution to reducing poverty, emphasizing the important role of job creation in increasing people's productivity and income. In addition, it proves that the Human Development Index (HDI), which reflects the quality of education and population health, has a negative and significant influence on poverty. This finding is in line with Nurkse's view that improving the quality of human resources can encourage productivity and capital accumulation, thereby accelerating the exit from the poverty trap. Meanwhile, population growth, if not balanced with increased productivity and employment opportunities, can actually strengthen the cycle of poverty. shows that the increase in the number of people without adequate economic capacity support leads to an increase in poverty rates in the Horseshoe area. This is consistent with Nurkse's theoretical argument that population growth that is not accompanied by economic development will lower per capita income and strengthen underdevelopment. Thus, these

empirical findings confirm that poverty is not just the result of a single variable, but the result of a series of conditions that influence and reinforce each other. (Triani, 2024) (Sihite et al., 2024) (Matondang et al., 2024) (Ashari & Athoillah, 2023)

3. Methods

This study applied a descriptive quantitative approach with the panel data regression analysis method. There is one dependent variable and three independent variables analyzed. The dependent variable in this study is the poverty level measured based on the percentage of population per province with per capita expenditure per month below the national poverty line. Poverty was chosen as a focus because it is the main indicator of welfare and social inequality which is still a serious problem in Indonesia.

The three independent variables used are TPAK, Population, and HDI. TPAK represents the involvement of the working-age population in economic activities, so that it has a direct effect on the income potential of the community. Population numbers reflect demographic pressures that can affect the level of need, job competition, and demand for public services. Meanwhile, HDI shows the quality of human resources based on aspects of health, education, and living standards, which are closely related to the ability of individuals to get out of poverty.

The analysis of the relationship between these variables used a panel data regression model. The selection of this model is based on its advantages in combining data across time and across regions, so as to be able to capture the dynamics and differences in the characteristics of each province during the research period. In addition, the panel data regression approach allows the use of statistical tests. The equation of the panel regression model used in this study is written as follows:

$$POVERTYit = \alpha + \beta 1TPAKit + \beta\ 2JUM\_PENDit + \beta 3IPMit + \varepsilon it$$

Information:

POVERTYit : Percentage of poverty in the first province in the year of the year
α : Model Constant
β1, β2, β3 : The regression coefficient of each independent variable
Stuttgart : TPAK
Jum_Pendit : Population
IPMit : IPM
Eit : *Error term*

4. Results and Discussion

4.1 Panel Data Regression Model Test Selection

In the analysis of panel data, the first step is to determine the most appropriate panel regression model to use, taking into account three alternative models, namely: Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The determination of the best model is carried out through three main tests, namely the Chow test, the Hausman test, and the Breusch Pagan Lagrange Multiplier (LM) test.

Table 1. Model Selection Test Results

Test	Probability	Decision Rule	Conclusion
Chow Test	0.0000	Prob. < 0.05 → Reject H0	Fixed Effect Model (FEM) preferred over CEM
Hausman Test	0.3587	Prob. > 0.05 → Accept H0	Random Effect Model (REM) preferred over FEM

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Test	Probability	Decision Rule	Conclusion
Lagrange Multiplier Test	0.0000	Prob. < 0.05 → Reject H0	Random Effect Model (REM) preferred over CEM

Source: Data Processing Results with EViews, 2025

The Chow Test result (Prob. = 0.0000 < 0.05) indicates that the Fixed Effect Model (FEM) is better than the Common Effect Model (CEM). However, the Hausman Test result (Prob. = 0.3587 > 0.05) suggests that the Random Effect Model (REM) is more appropriate compared to FEM, as there is no significant correlation between regressors and error terms. Furthermore, the Lagrange Multiplier (LM) Test result (Prob. = 0.0000 < 0.05) confirms that REM is preferred over CEM.

Thus, the most suitable model for this study is the Random Effect Model (REM), with the following estimated equation:

$$POVERTYit=45.0742+0.0966TPAKit-0.1148JUMLAH\_PENDUDUKit-0.5629IPMit+\varepsilon it$$

4.2 Classic Assumption Test

4.2.1 Normality Test

The Normality Test aims to find out whether the residual distribution in the regression model follows the normal distribution.

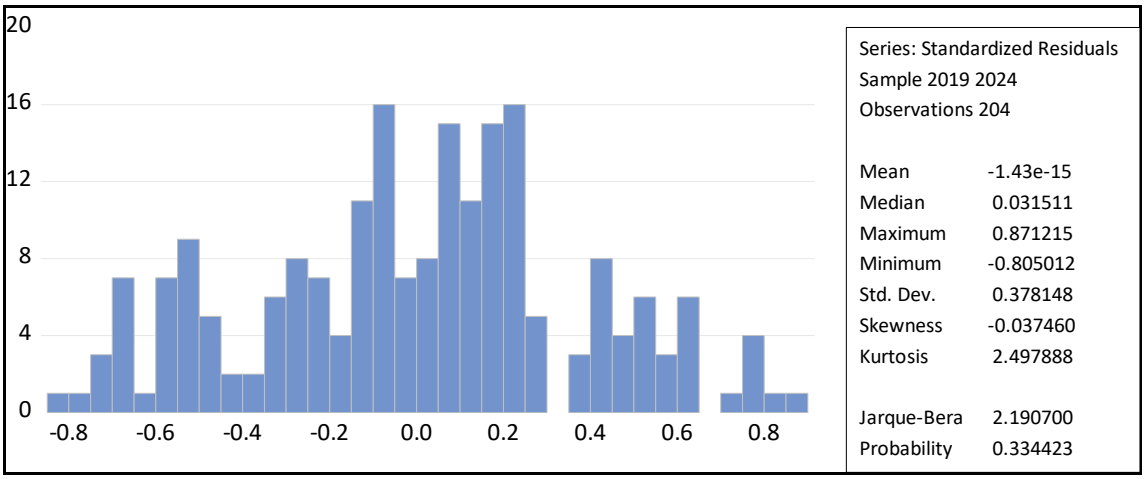

Figure 1. Normality Test

Source: Data Processing Results with EViews, 2025

Based on the residual histogram and supporting statistics, information was obtained that the Jarque-Bera value was 2.190700 with a probability of 0.334423 (> 0.05), which indicated that there were no significant deviations from normality. Based on the probability of the Jarque-Bera test exceeding 0.05, the null (H_0) hypothesis is accepted, which means that the residual of this regression model is normally distributed. This condition strengthens the validity of the model and allows the interpretation of regression parameters.

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4.2.2 Multicollinearity Test

This Multicollinearity test was carried out to find out whether there was a high correlation between independent variables.

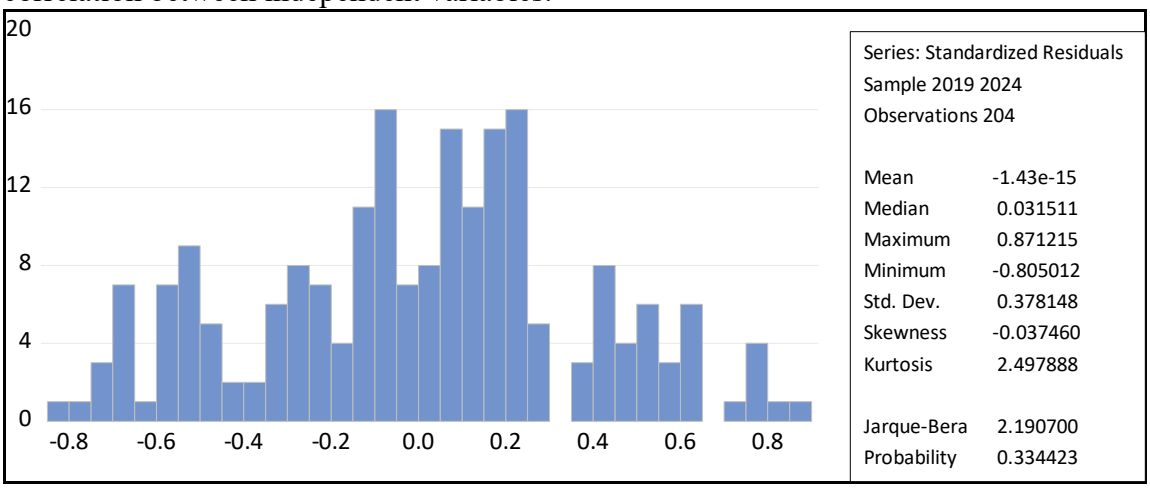

Figure 2. Multicollinearity Test

Source: Data Processing Results with Eviews, 2025

The test results showed that in this study, no correlation value between independent variables exceeded 0.90. Thus, the model is free from the problem of multicollinearity and the estimation of regression coefficients can be said to be stable and unbiased.

4.2.3 Diagnostic Test Results

Table 2. Autocorrelation and Heteroscedasticity Test

Test Type	Probability	Decision Rule	Conclusion
Autocorrelation Test	0.9571	Prob. > 0.05 → Accept H0	No autocorrelation, regression assumptions met
Heteroscedasticity Test	< 0.05	Prob. < 0.05 → Reject H0	Indicates heteroscedasticity. However, this is common in panel data due to differences between cross-section units

The diagnostic test results indicate that the model does not experience autocorrelation problems, as evidenced by the p-value of 0.9571, which is greater than the 5% significance level. This finding confirms that the regression assumptions are satisfied and that the residuals are not serially correlated. On the other hand, the heteroscedasticity test shows a p-value below 0.05, which suggests the presence of heteroscedasticity. Nevertheless, in the context of panel data analysis, heteroscedasticity is a common phenomenon due to variations across cross-sectional units. Therefore, the presence of heteroscedasticity does not necessarily undermine the validity of the Random Effect Model (REM), particularly when robust standard errors are employed to address this issue.

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4.3 Statistical Test

Table 3. Statistical Test Results

Test Type	Variable(s)	Test Value	Critical Value	Probability	Decision	Interpretation
t-test (Partial)	X1 (TPAK)	t Test = 4.6535	t-table = 1.9717	0.0000 < 0.05	Reject H_0	TPAK has a significant positive effect on poverty.
	X2 (Population Size)	t Test = -0.2810	t-table = 1.9717	0.7790 > 0.05	Accept H_0	Population size has no significant effect on poverty.
	X3 (HDI)	Test t = -19.0224	t-table = 1.9717	0.0000 < 0.05	Reject H_0	HDI has a significant negative effect on poverty.
F-test (Simultaneous)	X1, X2, X3	F Test = 123.6526	F-table = 2.6497	0.0000 < 0.05	Reject H_0	TPAK, population, and HDI jointly have a significant effect on poverty.
Coefficient of Determination (R^2)	Model	Adjusted R^2 = 0.6444	-	-	-	About 64.44% of the variation in poverty is explained by TPAK, population, and HDI, while 35.56% is explained by other factors outside the model.

Source: Data Processing Results with EViews, 2025

The results of the partial test (t-test) show that TPAK (X1) and HDI (X3) significantly influence poverty, while population size (X2) does not have a significant effect. The simultaneous test (F-test) indicates that all independent variables together significantly affect poverty levels in Indonesia. Furthermore, the adjusted R^2 value of 0.6444 suggests that the model is able to explain approximately 64.44% of the variation in poverty, reflecting a fairly strong explanatory power. The remaining 35.56% is influenced by other socio-economic factors not included in the model, such as unemployment, informal labor structures, regional economic growth, and income distribution policies.

4.4 Discussion

4.4.1 The Effect of the Labor Force Participation Rate (TPAK) on Poverty

The results of the t-test on the TPAK variable showed that the t-calculated value was 4.6535, greater than the t-table of 1.9717, with a significance value of 0.0045 (< 0.05). Thus, the zero (H_0) hypothesis is rejected and the alternative hypothesis (H_1) is accepted, which means that TPAK partially has a significant effect on poverty levels.

However, the direction of the regression coefficient for the TPAK variable shows a positive relationship, which indicates that the higher the TPAK, the poverty rate tends to increase. These findings contain an important meaning that increasing labor force participation is not necessarily directly proportional to improving people's welfare. In this context, the increase in TPAK may reflect a survival economic impulse, in which more individuals enter the labor market not because of the availability of productive jobs, but because of the need to survive due to economic stresses.

Another factor is the dominance of the informal sector in many provinces in Indonesia. Many workers are engaged in informal work that does not provide legal protections, living wages, or social security. As a result, even though they work, their economic conditions remain below the poverty line.

In addition, the high TPAK can also be caused by limited access to formal education, so that people enter the job market faster even with low skills. This has an impact on low productivity and inadequate income. This finding is in line with the vicious circle of poverty theory put forward by Nurkse (1953) that limited labor quality leads to low productivity, which ultimately triggers low incomes and perpetuates poverty.

Thus, even though TPAK has increased, without improving the quality of employment and efforts to improve human resources, increasing labor participation has not been effective in reducing poverty. Therefore, future employment policies need to be directed not only at expanding employment opportunities, but also at improving the quality of work (decent work), including vocational training, regional industrialization, and incentives for the formal sector.

4.4.2 The Influence of Population on Poverty

The results of the t-test showed a t-count value of -0.2810, which is smaller than the t-table of 1.9717, and a significance value of 0.7790 (> 0.05). Thus, H_0 is accepted, which means that the number of people does not have a significant effect on the poverty level partially.

These results indicate that the size of the population is not directly a factor that determines the poverty rate in an area. This finding is interesting because it is generally assumed that the larger the population, the higher the poverty rate. But in reality, the relationship is non-linear and highly dependent on the capacity of the region to manage its human resources.

In some provinces with large populations such as West Java, East Java, or North Sumatra, poverty rates can remain low if supported by strong economic structures, adequate infrastructure, and equitable public services. On the other hand, areas with a smaller population but not having good economic and educational facilities can actually experience higher poverty.

Thus, the number of new residents has an impact on poverty if it is not accompanied by economic development, job creation, and adequate quality of basic services. In this context, it is important to see the population not only as a number, but as a potential for development if managed properly. When a large population is accompanied by superior

human resources, then they can become a productive economic force. However, if not, then the population can become a structural burden.

4.4.3 The Effect of the Human Development Index (HDI) on Poverty

The results of the t-test on the HDI variable showed a t-count of -19.0224, far exceeding the t-table of 1.9717, and a significance value of 0.0000, which means it is very significant. Thus, H_0 is rejected and H_1 is accepted, so it can be concluded that HDI partially has a significant effect on poverty levels.

The direction of the relationship between HDI and poverty is negative, which means that the higher the HDI value in a province, the poverty rate tends to decrease. These results are in line with the basic concept of human development, where the quality of human resources is the main key to improving welfare and reducing poverty. HDI as a combined indicator of life expectancy, average length of schooling, length of schooling, and per capita expenditure shows how much a region is able to create a decent life for its residents.

When people have access to quality education, they have the opportunity to enter a more productive and high-income work sector. Similarly, a healthy society with adequate purchasing power will be better able to take advantage of economic opportunities. In other words, increasing HDI creates strong social and economic capital to drive inclusive and sustainable growth.

These findings are reinforced by previous research such as those conducted by and which show that (Prasetyoningrum & Sukmawati, 2018) (Matondang et al., 2024) HDI has a significant negative influence on poverty, both at the national and regional levels. This is also in line with the Sustainable Development Goals (SDGs), especially goal 1 (eradicating poverty) and goal 4 (quality education), which are interconnected in creating social progress.

5. Conclusion

The findings in this study are very relevant to the Poverty Circle Theory put forward by Ragnar Nurkse (1953). In his theory, Nurkse stated that poverty is circular and mutually reinforcing. Low human quality (HR), which is reflected in poor education and health, leads to low labor productivity. As a result, income is also low, savings and investments are limited. Low investment leads to less productive job creation, which ultimately reinforces poverty itself.

1) The results that HDI negatively affects poverty suggest that investment in education and health can break the cycle of poverty. When human resources are qualified, productivity increases, income increases, and people can get out of poverty.
2) On the other hand, the results that TPAK has a positive effect on poverty confirm that simply involving labor without improving the quality of work actually maintains poverty, as described by Nurkse, a large but unproductive workforce only adds to the burden, not becomes an economic solution.
3) The population that is insignificant to poverty also reinforces Nurkse's concept that high population is only a problem if it is not balanced with productivity. In an unprepared system, large populations can strengthen poverty, but if supported by good human development, it becomes an economic force.

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