Journal of Taxation, Accounting, Management and Economics, Vol 2 Issue 1, January 2024
e-ISSN: 2988-7097
p-ISSN: 2988-7089

POVERTY ANALYSIS IN THE PROVINCES OF MALUKU AND WEST PAPUA IN 2022: AN APPLICATION OF STOCHASTIC FRONTIER ANALYSIS (SFA)

Marsandhi Evan Dino Pardede[1*], Muhammad Erza Lesmana[2]
[1*]Kementerian Keuangan, Indonesia, *marsandhi.evan@kemenkeu.go.id*
[2]Politeknik Statistika STIS, Indonesia, *erzaalfas23@gmail.com*

***Corresponding author: marsandhi.evan@kemenkeu.go.id*

Abstract**:** *Poverty is one of the macroeconomic problems facing all countries in the world including Indonesia. The Indonesian Government is working to eradicate poverty through the 2015-2019 and 2020-2024 Medium-term Development Plan (RPJMN) which refers to the Sustainable Development Goals (SDGs). One of the Indonesian government programs to combat poverty is the Transfer to the Regional and Village Fund (TKDD) of the nonphysical Special Allocation Fund (DAK Nonfisik). The provinces of Maluku and West Papua are two of the five provinces with the highest poverty rates and the largest per capita nonphysical DAK recipients by 2022. The study aims to provide a general picture and analyze the efficiency level and the impact of nonphysical DAK on poverty levels in Maluku Province and West Papua by 2022. The result is that there are more than 80% of districts/cities in the two provinces whose poverty levels have not reached the target set by the government. All the districts/cities in both provinces have a low level of nonphysical DAK efficiency reflected in none of the funds signaling a lowering of the poverty rate.*

Keywords**:** *Poverty, DAK, Efficiency, SFA.*

INTRODUCTION

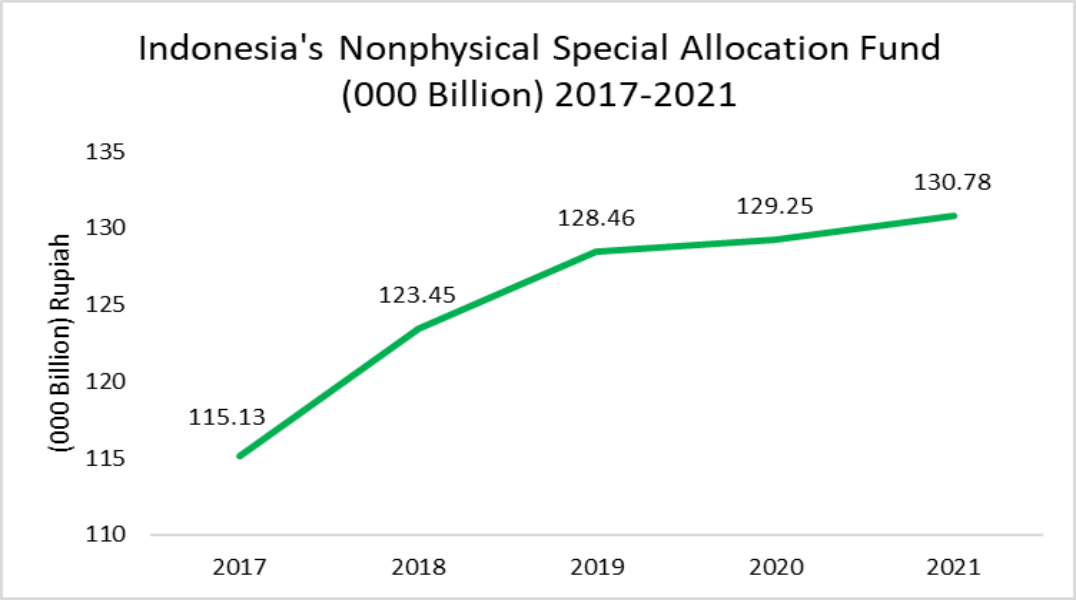
Poverty is a macroeconomic problem faced by all countries in the world. Poverty can be the root of problems in various dimensions, such as economic, social, health, and education. Seeing that the effects of poverty can cause many problems, all countries in the world agreed to prioritize poverty alleviation as the first goal written in the global action Sustainable Development Goals (SDGs) compiled by 194 countries, civil society, and economic actors from all countries in the world under the auspices of the United Nations (UN). The first goal, namely no poverty, means that people worldwide can live in prosperity, at least being able to fulfill their daily needs.

Indonesia is one of the countries that uses the SDGs as a basic reference in terms of poverty alleviation from the national level to the smallest level, namely districts/cities. In order to prepare and strive to fulfill the first goal of the SDGs, Indonesia has made several policies called the National Medium-Term Development Plan (RPJMN) for the period 2015-2019 and 2020-2024. These government efforts aim to accelerate poverty alleviation in Indonesia. Figure 1 shows that from 2016-2022, the percentage of poor people in Indonesia tended to decrease. Despite the decline, the percentage of poor people in Indonesia still has not reached the targets set out in the RPJMN 2015-2019 and 2020-2024.

Source: Central Bureau of Statistics of the Republic of Indonesia (Author's Processing)

Figure 1. Poverty Level Achievements and Targets in Indonesia 2015-2021

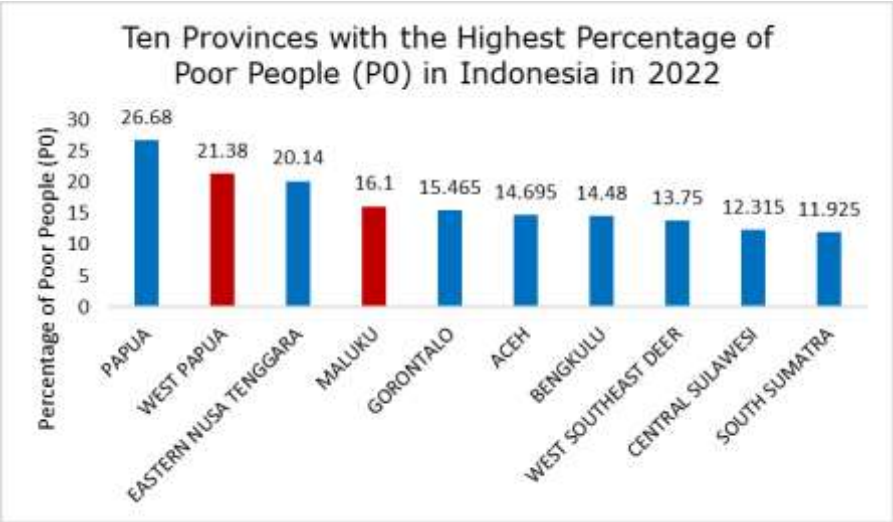
One of the Indonesian government's efforts to accelerate poverty alleviation is the Transfer to Regions and Village Funds budget allocation program (Ministry of Finance, 2022). One of the Transfers to Regions and Village Funds (TKDD) created is the nonphysical Special Allocation Fund (DAK Nonfisik) which is allocated in the State Revenue and Expenditure Budget (APBN) to regions to facilitate community access to basic public services (education, health, food, and others). The nonphysical DAK is in the form of Family Planning Operational Assistance Fund, Health Operational Assistance Fund, School Operational Assistance Fund, Equivalency Education Implementation Assistance Fund, Early Childhood Education Operational Assistance Fund, and Food Security and Agriculture Fund. These funds are allocated with the hope of accelerating poverty alleviation.



Source: Ministry of Finance (Author's Processing)

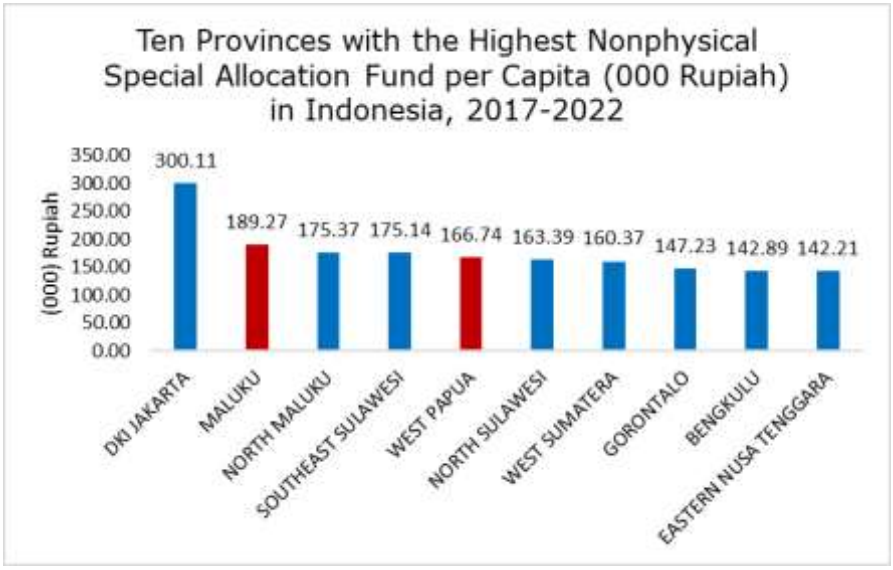
Figure 2. Nonphysical Special Allocation Fund (Billion) Indonesia 2017 - 2021

Based on Figure 2 above, it can be seen that Indonesia's nonphysical Special Allocation Fund (DAK Nonfisik) from 2017 to 2021 has increased every year. This means that the nonphysical DAK transfer program has been successfully realized, which is reflected in a decrease in the percentage of poor people in Indonesia (P_0). When viewed in each province in Indonesia, in 2022 Maluku and West Papua provinces are among the five provinces with the highest percentage of poor people in Indonesia as attached in Figure 3 in the appendix.



Source: Central Bureau of Statistics (Author's calculation)

Figure 3. Ten Provinces with the Highest Percentage of Poor People (P0) in Indonesia in 2022



Source: Ministry of Finance (Author's calculation)

Figure 4. Ten Provinces with the Highest nonphysical Special Allocation Fund per Capita (IDR) in Indonesia 2017-2021

Although Figure 3 (in the appendix) shows that Maluku and West Papua are among the five provinces with the highest percentage of poor people in Indonesia, Figure 4 (in the appendix) shows that these two provinces are the recipients of the highest nonphysical DAK per capita in Indonesia. Based on this, it is suspected that there is a problem of inefficiency in the distribution of the nonphysical DAK budget allocated to these two provinces. For this reason, it is necessary to evaluate the level of efficiency and the effect of nonphysical DAK on the poverty rate in Maluku and West Papua Provinces so that the

problem of poverty in Indonesia can be reduced. Therefore, this study aims to determine the general picture of poverty and analyze the level of efficiency and the effect of nonphysical DAK on poverty levels in Maluku and West Papua Provinces in 2022.

LITERATURE REVIEW

1. Nonphysical Special Allocation Fund (DAK Nonfisik)

Nonphysical DAK is a fund allocated in the APBN to regions that aim to help fund special nonphysical activities to facilitate community access to basic public services. The types of nonphysical Special Allocation Funds are the Family Planning Operational Assistance Fund, Health Operational Assistance Fund, Equivalency Education Operational Assistance Fund (BOP), Early Childhood Education Operational Assistance Fund (PAUD), School Operational Assistance Fund (BOS), Investment Facilitation Fund, Food Security and Agriculture Fund, Population Administration Service Fund, Tourism Service Fund, Women and Children Protection Service Fund, Cooperative Capacity Building Fund, Civil Servant Teacher Income Supplement Fund, Special Allowance Fund for Civil Servant Teachers in Special Regions, Professional Allowance Fund for Elementary School Teachers and so on. These funds are allocated in such a way as to assist the household affairs of each region in order to improve the welfare of the population therein (Ministry of Finance, 2022).

According to the Ministry of Finance (2022), of the types of nonphysical DAK mentioned above, the funds allocated to increase community accessibility to education, health and food security facilities in order to reduce poverty in a region are the Family Planning Operational Assistance Fund to reduce the number of non-productive age dependents such as family planning counseling and distribution of contraceptives, the Health Operational Assistance Fund to reduce the burden on the community in terms of financing access to quality health services, Equivalency Education Operational Assistance Fund to help finance following the activities of the Package program education process in accordance with statutory regulations, Early Childhood Education Operational Assistance Fund (PAUD) to help finance the community to follow the educational process of special learning for children at an early age, School Operational Assistance Fund (BOS) to help reduce the burden on the community in terms of financing access to 9-year compulsory education and Food Security and Agriculture Fund to help fund all activities that support food security operations.

2. Efficiency

According to (Famera & Indriani Mirna (2018), efficiency is the ability to produce the maximum possible output by using certain inputs or using the minimum possible input to produce a certain amount of output. Efficiency is divided into two, namely technical and allocative efficiency. Technical efficiency shows the ability to produce the maximum possible output with certain inputs, while allocative efficiency shows the use of the minimum possible input to produce a certain amount of output. According to Coelli et al. (2005), there is one way to measure efficiency, namely the Frontier approach with the Stochastic Frontier Analysis (SFA) method. Analysis using SFA aims to estimate the level of efficiency of using certain inputs to produce the maximum output in each individual. According to Mujeyi et al. (2016), the SFA analysis model used is shown in equation (1) as follows:

$$Y_i = f(X_i, \beta) + v_i + u_i \quad (1)$$

Keterangan:
Y_i = Output of the $i-th$ individual
X_i = Input of the $i-th$ individual
β = Unknown parameter
v_i = Symmetrically distributed random noise component
u_i = The inefficiency component is a non-negative number

In general, efficiency can be measured by looking at the value of the u_i component. The inefficiency value is in the range between $0 < u_i < \infty$. It is said to be more efficient if the value of u_i is close to 0. Efficiency can also be measured using the efficiency level obtained by the following formula:

$$TE_i = \frac{f(X_i, \beta) + u_i + v_i}{f(X_i, \beta) + v_i} \quad (2)$$

Keterangan:
TE_i : Efficiency level of the $i-th$ individual

In equation (2) above, it is known that the domain of the efficiency level is between $0 < TE_i < 1$. It is said to be more inefficient if the TE_i value is close to 0 and more efficient if the TE_i value is close to 1. Statistics Indonesia (2019) defines technical efficiency as the deviation of output from the frontier function. Technical efficiency is classified by BPS into three, namely:
1. Low efficiency: $0 \leq$ technical efficiency < 0.5
2. Medium efficiency: $0.5 \leq$ technical efficiency ≤ 0.75
3. High efficiency: $0.75 <$ technical efficiency ≤ 1

Relevant Research
This research is based on some related literature that has a relationship with the research topic. The first research that is used as a reference is the writing of (Jha, Biswal and Biswal, 2001) with the title "An Empirical Analysis of the Impact of Public Expenditures on Education and Health on Poverty in Indian States". The purpose of this study is to look at the factors that affect the P_0, P_1, and P_2 indices in India. The variables used are the percentage of poor people, poverty depth index, poverty severity index, and government spending on education and health expenditures. The model used in this study is an unbalanced panel model. The result obtained is that the selected model is the Fixed Effect Model (FEM) with education and health expenditure variables negatively affecting the P_0, P_1, and P_2 indices in India.

Furthermore, there is research conducted by (Bailey, Malkova and Norling, 2014) with the title "Do Family Planning Programs Decrease Poverty? Evidence From Public Census Data". This study aims to prove whether family planning programs can reduce the percentage of poor people in the United States. The variables used are the percentage of poor people and population expenditure on family planning programs. Data were obtained from population census results from 1960-1970. The results obtained that the family planning program has a negative effect on the percentage of poor people, which means that when spending on family planning programs is increased, it will reduce the percentage of poor people.

In 2017, Anjum and Tarique conducted a study entitled "Agriculture and Poverty Reduction in India: An Empirical Study". The purpose of the study was to look at the factors that affect poverty in India. The variables used are the percentage of poor people, per capita output from the agricultural sector, and the non-agricultural sector. The model used in this study is the Common Effect Model (CEM) data regression model. The results obtained are the output per capita of the agricultural and non-agricultural sectors has a negative effect on poverty in India.

In addition, there is research conducted by (Sirag and Mohamed Nor, 2021) with the title "Out-of-Pocket Health Expenditure and Poverty: Evidence from a Dynamic Threshold Analysis". The purpose of this study is to look at the factors that influence the poverty headcount index, poverty depth index, and poverty severity index in 145 countries from 2000 to 2017. The variables used are the percentage of poor people, poverty depth index, poverty severity index, government expenditure on health spending, and GDP per capita. The model used is a dynamic threshold model. The results obtained are that government spending on health expenditure has a negative effect on the percentage of poor people, the poverty depth index, or the poverty severity index.

The last research that is used as a reference is research conducted by (Firstiani and Emillenia, 2021) with the title "Efficiency Analysis of Government Assistance in Poverty Reduction: Parametric Stochastic Frontier Analysis". The purpose of this study was to analyze the efficiency level of the East Java Provincial Government's assistance program

in reducing poverty in each Regency / City for the 2015-2020 period. The analytical tool used is parametric Stochastic Frontier Analysis. The variables used in this study are the number of poor people and the government budget in the fields of health, education, social assistance and infrastructure. The results obtained are that on average the results of all government programs as a whole have not reached the efficiency level. This is because the inputs used are not proportional to the output achieved.

Based on related research, several determinants significantly affect the poverty rate, namely the level of education, health, food security, and the efficiency of poverty alleviation programs. Thus, to reduce the poverty rate, it is necessary to have easy access to education, health, and food security. In Indonesia, several policies have been implemented to increase community accessibility to reduce poverty, namely the nonphysical Special Allocation Fund (DAK Nonfisik) in the form of Family Planning Operational Assistance Fund, Health Operational Assistance Fund, Education Operational Assistance Fund, and Food Security and Agriculture Fund. Therefore, the purpose of this study is to find out the factors that affect the poverty rate based on the indicators of the four funds by looking at the level of efficiency in Maluku and West Papua Provinces in 2022.

RESEARCH METHOD

1. Data and Data Sources

The data used in this study are secondary data sourced from the Indonesia Central Bureau of Statistics (BPS Indonesia) and the Ministry of Finance Directorate General of Fiscal Balance (Kemenkeu DJPK). The coverage area studied is Maluku and West Papua Provinces with the unit of analysis being all districts/cities in the two provinces in 2022. The response variable used is the percentage of poor people, while the explanatory variables are the proportion of Family Planning Assistance Fund, the proportion of Health Operational Assistance Fund, the proportion of Education Assistance Fund, and the proportion of Food Security and Agriculture Assistance Fund. Information about the variables used is contained in Table 1 in the appendix.

Table 1. Description of the Variables Used in the Research

Notation	Variable	Sources
(1)	(2)	(3)
Y	Percentage of Poor Population (P0)	BPS
X1	Proportion of Family Planning Assistance Fund	Ministry of Finance DJPK
X2	Proportion of Health Operational Assistance Fund	Ministry of Finance DJPK
X3	Proportion of Education Assistance Fund	Ministry of Finance DJPK
X4	Proportion of Food Security and Agriculture Assistance Fund	Ministry of Finance DJPK

Source: Processing Results

2. Analysis Method

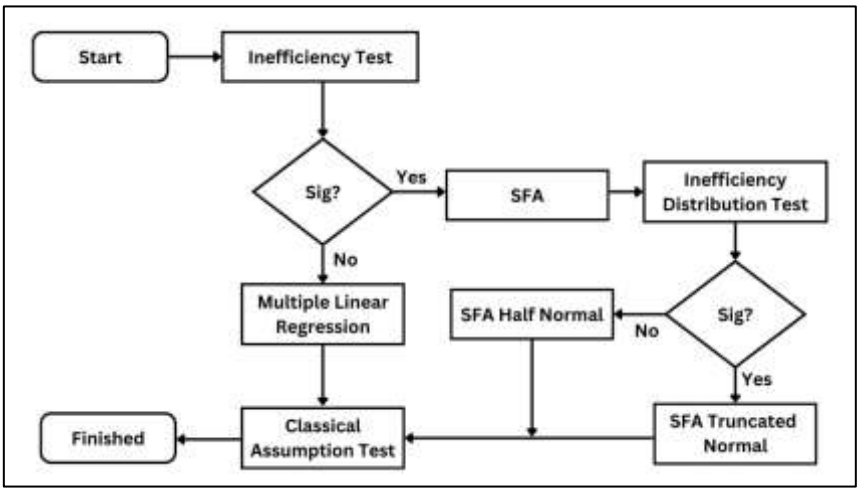
The analysis method in this study uses descriptive analysis and inferential analysis. Both analyses are used with the aim of answering this research question. The descriptive analysis in this study will describe the poverty rate in all regencies/cities in Maluku and West Papua Provinces in 2022 presented in the form of thematic maps. This descriptive analysis will use QGIS 3.10.14 software.

This inference analysis will explain whether the nonphysical Special Allocation Fund variables, which include the proportion of Family Planning Operational Assistance Fund, the proportion of Health Operational Assistance Fund, the proportion of Education Assistance Fund, and the proportion of Food Security and Agriculture Fund, affect the poverty rate in Maluku and West Papua Provinces in 2022. SFA analysis was conducted to determine the location of districts/cities that have inefficiencies in the allocation of nonphysical DAK. This inference analysis uses the help of R-Studio software. The analysis method used is the cross-section SFA method. The stages of the SFA regression method

are as follows:

- Conduct inefficiency test. If the result is not significant then the selected model is RLB and if the result is significant then proceed to the inefficiency distribution test.
- Conduct an inefficiency distribution test. If the result is not significant, the selected model is Half-Normal SFA and if the result is significant, the selected model is Truncated-Normal SFA.
- Perform classical assumption tests on the selected model.

There is a more summarized stage that can be seen in Figure 5 in the appendix.



Source: Processing Results

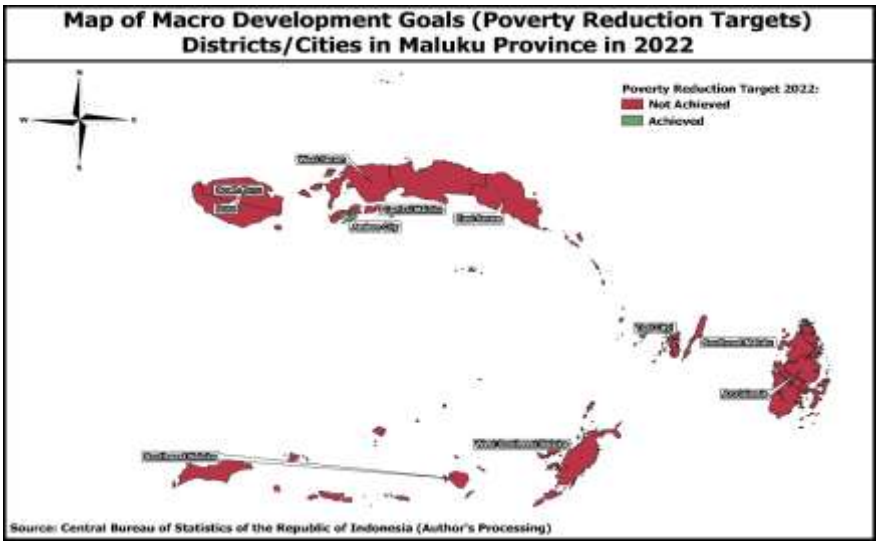
Figure 5. Flowchart of SFA Regression Model Building

RESULTS AND DISCUSSION

1. Maluku province

To achieve the first objective in this research, a thematic map is presented that can provide information related to an overview of districts/cities in Maluku Province whose poverty rates have or have not reached the RPJMN 2020-2024 target.

1.1. Overview of Poverty Levels



Source: Central Bureau of Statistics of the Republic of Indonesia (Author's Processing)

Figure 6. Poverty Level Achievement Map of Maluku Province in 2022

The map of the distribution of poverty rate achievements in Maluku Province is shown in Figure 6 above. It can be seen that only Kabupaten Ambon has achieved its poverty rate target, while the other districts/municipalities have not yet achieved the expected target. This is because the distance between districts/municipalities in Maluku Province is very far from each other. Most districts in Maluku Province are separated and scattered in a cluster of islands, both large and small islands so that the most widely used access is sea access. According to Bappenas (2018), most sea transportation facilities and infrastructure in Maluku Province, such as ferry boats and ports, are inadequate in terms of schedule and quality. In addition, access by sea is increasingly difficult, especially when entering certain seasons with high wind conditions and sea waves, making it difficult for ships to operate at all times. This is a challenge faced by the community, such as the obstruction of community mobility and the mobility of goods and services. This has hampered economic activity and reduced people's income, making it difficult to reduce the poverty rate to the RPJMN target.

1.2. The Effect of nonphysical Special Allocation Fund on Poverty Levels

To fulfill the second objective of this study, the influence and efficiency level of nonphysical DAK on the poverty rate in Maluku Province are analyzed using the Stochastic Frontier Analysis (SFA) method. The first step is to test the significance of the inefficiency of nonphysical DAK on the poverty rate using the Likelihood Ratio test. The test results are listed in Table 2 below.

Table 2. Inefficiency Significance Test

LR test	p-value	Conclusion
(1)	(2)	(3)
3.64	0.056*	Reject H_0

Description: *) significant at $\alpha = 10\%$
Source: Processing Results

In Table 2 above, it can be seen that at a real level of 10%, the result shows the rejection of H_0, which means that at a significance level of 10% based on the existing data, it can be concluded that there is an inefficiency in the allocation of nonphysical DAK in reducing poverty levels in Maluku Province. The next step is to test the type of probability density distribution (pdf) of the inefficiency using the Likelihood Ratio test. The results are listed in Table 3 in the appendix.

Table 3. Inefficiency Chance Density Distribution Type Test

Probability Distribution Type	Log Likelihood	LR test	p-value	Conclusion
(1)	(2)	(3)	(4)	(5)
SFA Half-Normal	-29.138	0.002	0.998	Failure to Reject H_0
SFA Truncated-Normal	-29.137	-	-	-

Source: Processing Results

Table 3 (available in the appendix) shows that at a real level of 10%, the result fails to reject H_0, which means that at a 90% confidence level it can be trusted that the probability density distribution type of inefficiency follows a Half-Normal distribution. The next step is to estimate the effect and significance of nonphysical DAK on the poverty rate in Maluku Province. The results are listed in Table 4 below.

Table 4. Parameter Coefficient Estimation Results

Variable	Coefficient	Std. Error	t-statistic	p-value
(1)	(2)	(3)	(4)	(5)
Intercept	22.904	33.193	0.690	0.755
Proportion of Family Planning Assistance Fund	-1.944	2.228	-0.872	0.192

Proportion of Health Operational Assistance Fund	0.567	0.194	2.922	0.998
Proportion of Education Assistance Fund	-0.288	0.700	-0.412	0.340
Proportion of Food Security Assistance Fund	0.540	3.094	0.174	0.569

Source: Processing Results

Based on Table 4, it can be seen that none of the nonphysical DAK budgeted by the government was able to reduce the poverty rate in Maluku Province in 2022. The Family Planning and Health Operational Assistance Fund was not able to reduce the poverty rate in Maluku Province. This is due to the limited availability of access to health facilities and the presence of professional doctors and midwives in Maluku Province. According to Bappenas (2018), only 14% of villages in Maluku Province have access to health facilities. This is due to the distance between regions that are far adrift and separated from each other by the vast sea so that the distribution of health facilities such as medical devices, medicines, contraceptives, and so on becomes inefficient and cannot be felt by the community significantly. Therefore, people who live in villages without access to health facilities must access health facilities elsewhere.

However, there are obstacles faced by the community in terms of transportation and infrastructure, such as inadequate public transportation, roads, or ports to access health facilities elsewhere. According to Bappenas (2018), only 68% of villages have access to land public transportation. This difficulty in accessing health facilities makes the level of public health decrease, which results in the opportunity for people to be able to work decreasing, so that in the end the poverty rate cannot decrease as expected.

The Education Operational Assistance Fund has not been able to reduce the poverty rate in Maluku Province. This is due to the limited availability of access to education facilities in Maluku Province. According to Bappenas (2018), only 45% of villages in Maluku Province have SMK schools, 54% of villages have SMA/MA schools, and only 66% of villages have SMP/MTs schools. Therefore, people who live in villages without access to school facilities have to go to school elsewhere. However, just like the previous explanation, the availability of transportation, such as public transport, road infrastructure, and inadequate ports, hampers the community in accessing education facilities elsewhere. The difficulty of accessing educational facilities makes the community's abilities and skills needed in the scope of work lower and results in lower opportunities to obtain better employment opportunities. This also prevents the poverty rate from falling as expected.

The Food Security Assistance Fund has also been unable to reduce the poverty rate in Maluku Province. This is because only 9% of villages have asphalt road access to agricultural production centers (Bappenas, 2018). Therefore, people who live and work in the agricultural sector in these villages find it difficult to sell their agricultural products to production centers. These obstacles have led to low wage levels for people in these villages who work in the agricultural sector. This low level of wages is followed by a low level of consumption, which results in a poverty rate that cannot fall as expected. Next, the level of efficiency of the distribution of nonphysical DAK in alleviating poverty in each kabupaten/kota in Maluku Province will be presented. The results are presented in Table 5 below.

Table 5. Efficiency Level of nonphysical DAK at Regency/City Level in Maluku Province

District/City	P0
	Efficiency (%)
(1)	(2)
Southwest Maluku	4.299 (Low)
West Southeast Maluku	4.289 (Low)
Central Maluku	4.286 (Low)
Southeast Maluku	4.280 (Low)

Buru	4.272 (Low)
Ambon	4.226 (Low)
West Seram	4.321 (Low)
East Seram	4.237 (Low)
Aru Islands	4.239 (Low)
Tual City	4.283 (Low)
South Buru	4.225 (Low)
Maluku Province	4.225 (Low)

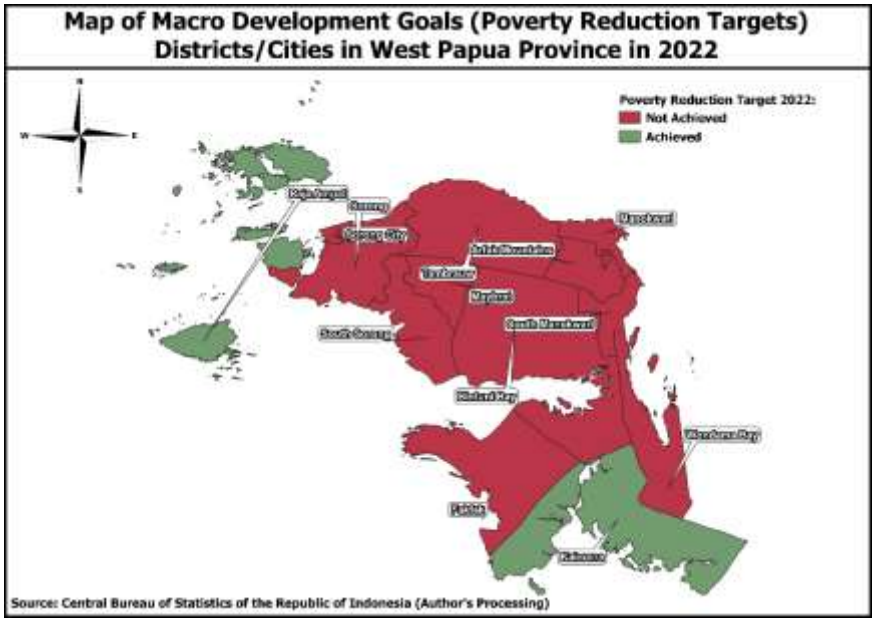
Source: Processing Results

Based on Table 5 above, it can be seen that the level of efficiency of the nonphysical Special Allocation Fund in all districts/cities in Maluku Province in alleviating poverty is still classified as Low. This can be explained from Figure 6 that the geographical condition of Maluku Province, which consists of small islands and is separated by the ocean from each other, is a challenge for the Government to distribute basic service assistance funds to residents in the region. This challenge causes difficulty in accessing basic services and assistance to the poor, which in turn makes the funds inefficient in alleviating poverty. This is why the poverty rate in almost all districts/cities has not reached the target expected by the government.

2. West Papua Province

To achieve the first objective of this research, a thematic map is presented that can provide information related to an overview of districts/cities in West Papua Province whose poverty rates have or have not reached the RPJMN 2020-2024 target.

2.1. Overview of Poverty Levels



Source: Central Bureau of Statistics of the Republic of Indonesia (Author's Processing)

Figure 7. Poverty Level Achievement Map of West Papua Province in 2022

The map of the distribution of poverty rate achievements in West Papua Province is shown in Figure 7 above. It can be seen that only Kabupaten Raja Ampat and Kaimana have reached the poverty rate target, while the other districts/municipalities have not yet reached the expected target. One of the reasons for this is the difficult topography of the region. Most of the villages in the districts/municipalities in West Papua Province are located in valley and mountainous areas. A total of 67 villages in Teluk Wondama Regency are located on slopes/mountain tops, 39 villages in Maybrat Regency are located

on slopes/mountain tops, and 82 villages in Fak-Fak Regency are located on slopes/mountain tops. The difficulty of the terrain in these districts hampers the mobility of the community and goods and services. This results in hampered economic activity and decreased community income, resulting in a high poverty rate.

2.2. The Effect of nonphysical Special Allocation Fund on Poverty Levels

To answer the second objective of this study, the effect and efficiency level of nonphysical DAK on the poverty rate in West Papua Province are analyzed using the Stochastic Frontier Analysis (SFA) method. The first step is to test the significance of the inefficiency of nonphysical DAK on the poverty rate using the Likelihood Ratio test. The test results are listed in Table 6 below.

Table 6. Inefficiency Significance Test

LR test	P-value	Conclusion
(1)	(2)	(3)
4.95	0.026*	Reject H_0

Source: Processing Results

Table 6 above shows that at a real level of 10%, the result shows the rejection of H_0, which means that at a significance level of 10% based on the existing data, it can be concluded that there is inefficiency in the allocation of nonphysical DAK in reducing the poverty rate in West Papua Province. The next step is to test the probability density distribution type (pdf) of the inefficiency using the Likelihood Ratio test. The results are listed in Table 7 in the appendix.

Table 7. Inefficiency Chance Density Distribution Type Test

Probability Distribution Type	Log Likelihood	LR test	p-value	Conclusion
(1)	(2)	(3)	(4)	(5)
SFA Half -Normal	-36.230	0.002	0.998	Failure to Reject H_0
SFA Truncated-Normal	-36.229	-	-	-

Source: Processing Results

Table 7 (available in the appendix) shows that at 10% real level, the result fails to reject H_0, which means that at 90% confidence level, it can be trusted that the probability density distribution type of inefficiency follows the Half-Normal distribution. The next step is to estimate the effect and significance of nonphysical DAK on the poverty rate in West Papua Province. The results are listed in Table 8 below.

Table 8. Parameter Coefficient Estimation Results

Variable	Coefficient	Std. Error	t-statistic	p-value
(1)	(2)	(3)	(4)	(5)
Intercept	0.755	16.040	0.047	0.962
Proportion of Family Planning Assistance Fund	2.239	0.628	3.563	0.999
Proportion of Health Operational Assistance Fund	0.047	0.134	0.356	0.639
Proportion of Education Assistance Fund	0.401	0.171	2.352	0.990
Proportion of Food Security Assistance Fund	-2.721	8.042	-0.338	0.367

Source: Processing Results

Based on Table 8, it can be seen that none of the nonphysical DAK budgeted by the government was able to reduce the poverty rate in West Papua Province in 2022. The Family Planning and Health Operational Assistance Fund was not able to reduce the poverty rate in West Papua Province. This is due to the lack of access to health facilities

and the presence of professional doctors and midwives in West Papua Province. According to Bappenas (2018), only 12% of villages in West Papua Province have access to health facilities, 4% of villages have professional doctors, and 29% of villages have midwives. This is because the territory of West Papua Province is dominated by mountainous areas and valleys so that the distribution of health facilities, such as medical equipment, medicines, contraceptives, and so on is inefficient and cannot be felt by the community significantly. Therefore, people who live in villages without access to health facilities must access health facilities elsewhere.

However, there are other problems faced by the community in terms of transportation and infrastructure, such as inadequate public transportation and roads to access health facilities elsewhere. According to Bappenas (2018), there are only 34% of villages that have access to land public transportation and only 55% of roads that can be traversed by 4-wheeled vehicles or more. This difficulty in gaining access to health facilities has led to a decline in the level of public health, which has implications for the community's chances of being able to work, so that in the end the poverty rate cannot decline as expected.

The Education Operational Assistance Fund has not been able to reduce the poverty rate in West Papua Province. This is due to the limited availability of access to education facilities in West Papua Province. According to Bappenas (2018), only 30% of villages in Maluku Province have SMK schools, 42% of villages have SMA/MA schools, and 56% of villages have SMP/MTs schools. Therefore, people who live in villages without access to school facilities have to go to school elsewhere. However, as explained earlier, the extreme geographical conditions and the availability of transportation, such as public transport and inadequate road infrastructure, prevent people from accessing education facilities elsewhere. This difficulty in accessing educational facilities makes the community's abilities and skills needed in the scope of work increasingly low, resulting in the opportunity to obtain better employment opportunities becoming increasingly low. This also prevents the poverty rate from falling as expected.

The Food Security and Agriculture Assistance Fund has also been unable to reduce the poverty rate in West Papua Province. This is because there are only 4% of villages that have access to asphalt highways to agricultural production centers (Bappenas, 2018). Therefore, people who live and work in the agricultural sector in villages that do not have access to asphalt highways find it difficult to sell their agricultural products to production centers. This obstacle makes the wage level of people in these villages who work in the agricultural sector low. This low level of wages is followed by a low level of consumption and results in a poverty rate that also cannot fall as expected. Next, we will present the level of efficiency of the distribution of the nonphysical Special Allocation Fund in alleviating poverty in each Regency/City in West Papua Province. The results are presented in Table 9 below.

Table 9. Efficiency Level of nonphysical DAK at Regency/City Level in Maluku Province

District/City	P0
	Efficiency (%)
(1)	(2)
Fak-Fak	1.115 (Low)
Kaimana	1.111 (Low)
Sorong City	1.118 (Low)
Manokwari	1.112 (Low)
South Manokwari	1.114 (Low)
Maybrat	1.118 (Low)
Arfak Mountains	1.116 (Low)
Raja Ampat	1.113 (Low)
Sorong	1.117 (Low)
South Sorong	1.115 (Low)
Tambrauw	1.113 (Low)

Bintuni Bay	1.119 (Low)
Wondama Bay	1.117 (Low)
West Papua Province	1.115 (Low)

Source: Processing Results

Based on Table 9 above, it can be seen that the level of efficiency of the nonphysical Special Allocation Fund in all Districts/Cities in West Papua Province in alleviating poverty is still classified as Low. This can be explained through Figure 7 that the geographical conditions of West Papua Province are dominated by mountainous areas and valleys so reaching residential areas is very difficult and requires a lot of money. Not only that, there are communities that occupy the outermost islands adjacent to the Philippines so reaching there takes almost 12 hours across the Pacific Ocean (Bappenas, 2018). The scattered settlement pattern makes the distribution of the nonphysical Special Allocation Fund very difficult and access to basic services and assistance to the poor becomes inefficient, making the poverty rate in almost all districts/cities not reach the target as expected by the Government.

CONCLUSIONS AND SUGGESTIONS

Based on the explanation above, it can be concluded that more than 80% of districts/municipalities in Maluku and West Papua Provinces do not have a poverty rate that is in line with the Government's target. None of the nonphysical Special Allocation Funds (DAK Nonfisik) distributed by the Government to Maluku and West Papua Provinces were significantly able to reduce the poverty rate. The nonphysical DAK distributed by the Government to all districts/municipalities in Maluku and West Papua Provinces has a low level of efficiency in reducing the poverty rate.

The suggestion is that the government should prioritize and evaluate the distribution of poverty alleviation funds in Maluku and West Papua Provinces so that it can be felt directly by the community. Evaluations that can be suggested include implementing a drone system to distribute health and education equipment to mountainous areas, implementing a mobile health service system such as boat health centers to isolated areas very far away in the islands, increasing boarding schools, and increasing paved roads, especially in areas that do not have access to paved roads.

REFERENCE

Anjum, S. and Tarique, Md. (2017). Agriculture and poverty reduction in India: An empirical study. *Asian Journal of Research in Social Sciences and Humanities*, 7(9), p. 35. Available at: https://doi.org/10.5958/2249-7315.2017.00441.5.

Central Bureau of Statistics (BPS). (2019). Efficiency Analysis of Manufacturing Industry. Accessed on December 20, 2023.

Bailey, M.J., Malkova, O. and Norling, J. (2014). Do Family Planning Programs Decrease Poverty? Evidence from Public Census Data'. *CESifo Economic Studies*, 60(2), pp. 312–337. Available at: https://doi.org/10.1093/cesifo/ifu011.

National Development Planning Agency (Bappenas). (2018). Analysis of High Poverty Areas. Accessed on December 19, 2023.

Coelli, T.J. *et al.* (2005). *An Introduction to Efficiency and Productivity Analysis*. Australia: Springer.

Famera, N.L.N. and Indriani Mirna (2018). EFFICIENCY ASSESSMENT OF DUAL BANKING SYSTEM IN INDONESIA USING STOCHASTIC FRONTIER ANALYSIS. Scientific Journal of Accounting Students [Preprint].

Firstiani, R. and Emillenia, S. (2021). Efficiency Analysis of Government Assistance Programs in Poverty Reduction: Parametric Stochastic Frontier Analysis. Proceedings of the National Seminar on Poverty Reduction, pp. 96-116.

Jha, R., Biswal, B. and Biswal, U.D. (2001). An Empirical Analysis of the Impact of Public Expenditures on Education and Health on Poverty in Indian States.

Ministry of Finance. (2022). Special Allocation Fund in Indonesia. Accessed on December 19, 2023

Mujeyi, K. *et al.* (2016). Technical Efficiency of Informal Manufacturing Sector

Enterprise: Evidence from the Informal Metal Industry of Zimbabwe. *African Journal of Science, Technology, Innovation and Development*, pp. 12–17.

Sirag, A. and Mohamed Nor, N. (2021). Out-of-Pocket Health Expenditure and Poverty: Evidence from a Dynamic Panel Threshold Analysis. *Healthcare*, 9(5), p. 536. Available at: https://doi.org/10.3390/healthcare9050536.