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Efficiency of Special Autonomy of Papua: Does it Have an Effect on the Poverty Rate?

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ABSTRACT
Papua Province has received special autonomy funds since 2001. The provision of special autonomy funds is to help improve the development and welfare of the Papuan people. In this research, the level of welfare is measured by poverty. The efficiency of special autonomy needs to be considered so that budget allocation can be right on target. This research aims to analyse the efficiency of special autonomy in Papua and its influence on poverty levels in 2018 - 2022. Data Envelopment Analysis (DEA) and Panel Data Regression Analysis are the research methods used. The variables used in this research are education function expenditure, health function expenditure, public service expenditure, average length of schooling, life expectancy, percentage of households with adequate drinking water, and efficiency value with DEA. The research results show that several districts/cities in Papua have reached the efficiency level. Furthermore, the variables of efficiency level, adequate drinking water, life expectancy, and spending on education have a negative and significant effect on the poverty level in Papua. Meanwhile, the variables average length of schooling, expenditure on health functions, and expenditure on service functions do not affect the poverty level in Papua Province. The findings in this research could help the government and researchers know the efficiency of special autonomy. Furthermore, this study will show which factors help decrease the poverty rate in Papua Province.

A. INTRODUCTION

Indonesia has implemented fiscal decentralisation for several decades (Anggraeni et al., 2023). Fiscal decentralisation in Indonesia is reinforced by the regulations of Law Number 22 of 1999 concerning Local Government and Law Number 25 of 1999 concerning Financial Balance between the Central Government and Regions (Pangestu, 2022). Fiscal decentralisation is closely related to regional autonomy, which refers to the transfer of authority to regions to manage their affairs, except for some issues directly controlled by the central government.

Regional autonomy is strengthened by Article 18A of the 1945 Constitution, which states that the law is a form of power relationship arrangement between the central government and regions. It considers regional diversity and specificity. In recent decades, asymmetric fiscal decentralisation has been implemented in several countries (Mollet, 2014; Prabowo et al.,

2021a). The implementation of that approach is closely related to the goal of achieving more efficient resource allocation and better provision of public services.

The diversity of Indonesia makes "one policy for all" less appropriate. Since 2001, Indonesia has implemented asymmetric fiscal decentralisation, which means applying principles that are not uniform and proportionate (Cahyaningsih & Fitrady, 2019). The principle of asymmetric decentralisation refers to the non-uniform allocation of fiscal resources between the central government and regions (Setiawan et al., 2016). One aspect of asymmetric decentralisation is granting special autonomy to certain areas, such as Apua Province (Keliat et al., 2021). Law Number 21 of 2001 concerning special autonomy is the foundation for implementing special autonomy in Papua. This regulation provides the legal basis for granting greater authority and budget allocation.

Giving special autonomy to Papua is based on several aspects, including welfare (Bauw, 2018; Katharina, 2018; Keliat et al., 2021; Prabowo et al., 2021a). If viewed based on the welfare aspect, as seen from the percentage of poverty in Papua, this value is higher than the national average. Figure 1 shows the national poverty average and the poverty rate in Papua Province. Based on Figure 1, the poverty rate in Papua Province is very high compared to the national average. Despite having abundant resources, poverty is still the biggest challenge for the governments of Indonesia and Papua. This shows that poverty alleviation needs to be the government's main priority.

Graph 1. Poverty Rate in Papua Province and Indonesia, 2021 – 2022 (%)
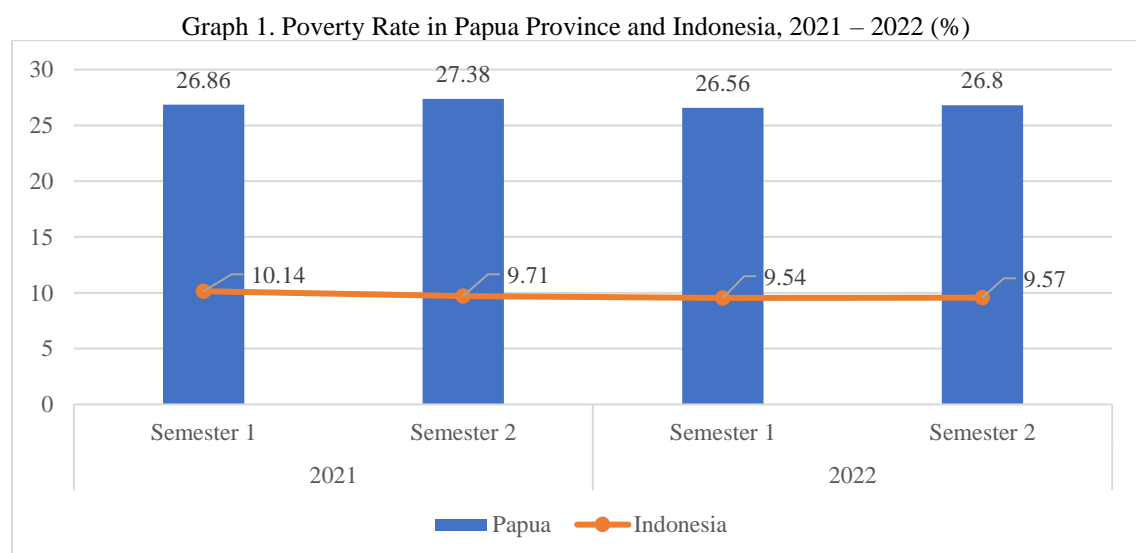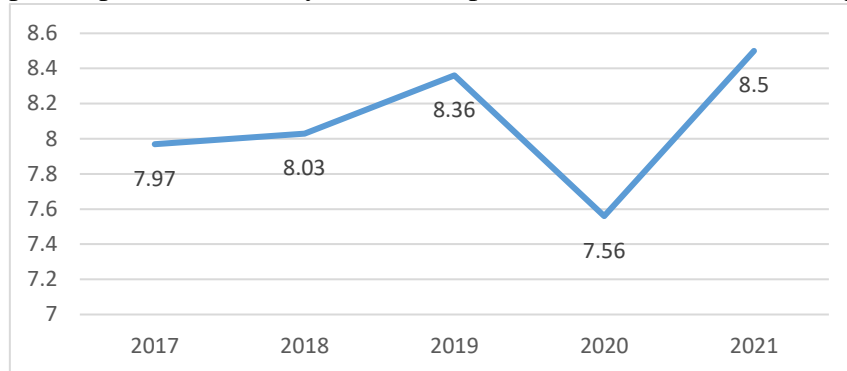

Source: BPS Indonesia

The main purpose of providing special autonomy funds is to help alleviate poverty (Fadhila et al., 2023). The efficiency of special autonomy in Papua is related to the implementation of the given policies. Special autonomy funds are intended for additional allocations for education, health, and basic services (Nunaki et al., 2023). Increased development in this field is expected to help improve people's welfare (Ijaiya et al., 2011). In addition, special autonomy is intended to give extended authority to the regions (Hasibuan, 2022).

Figure 2 shows the amount of special autonomy Papua has. Based on data on the sizeable special autonomy funds in Indonesia, using these funds is still less efficient (Fadhila et al., 2023). People in provinces who were given special autonomy funds revealed that they had not felt the immense impact of the existence of special autonomy (Cahyaningsih & Fitrady, 2019; Ikhsan et al., 2022a; Nurmasari & Hafis, 2019; Saflessa et al., 2023). Apart from that, the inefficiency of special autonomy funds can cause them to be vulnerable to

corruption (Nurmasari & Hafis, 2019). The inefficiency of special autonomy funds can also be reflected in the inequality and welfare between provinces receiving special autonomy and other provinces.

Graph 2. Special Autonomy Fund of Papua, 2017 – 2021 (Billion Rupiah)

Source: Ministry of Finance Indonesia

The implementation of special autonomy needs to be given proper attention to achieve the target of budget efficiency (Fadhila et al., 2023; Prabowo et al., 2021b). However, this implementation is not without problems; the lack of supervision can easily corrupt the special autonomy fund (Fadhila et al., 2023). Based on the vulnerabilities that may occur, the allocation of special autonomy needs to be considered, and coordination between the central and regional governments also needs to be harmonised.

This research focuses on analysing the efficiency of special autonomy in Papua and examining the factors that influence the poverty level in Papua Province. This research examines poverty analysis based on special autonomy input and output variables. Research on efficiency with Data Envelopment Analysis (DEA) has been carried out by several researchers, including (Gavurova et al., 2017; Prasetyo & Zuhdi, 2013; Priyadi et al. 2021; Putri & Prasetyia, 2023; Widodo, 2019). Meanwhile, discussions regarding the efficiency of special autonomy in Indonesia have been carried out (Prabowo et al., 2021; Hasibuan, 2022; Ikhsan et al., 2022)

The method of analysis used in this research is qualitative, involving interviews. The previous research results show that the special autonomy funds provided have not been allocated efficiently, which has impacted community welfare and has not improved. Researchers have also conducted studies discussing the determinants of poverty levels, but there are still gaps in the research results. This research is new compared to previous research. The novelty lies in the analysis method, research variables, and the latest research year. Researchers have not widely used DEA to measure particular autonomy efficiency, which makes this research fascinating.

B. LITERATURE REVIEW

Liando et al. (2014) explained that efficiency is a comparison between output and input, which is linked to performance standards or targets that have been set. Efficiency can be achieved when maximum output is obtained with certain inputs, or limited inputs can achieve specific outputs. In the KBBI dictionary, efficiency is the accuracy of the method (effort, work) used to carry out something (without wasting time, energy, or costs). The term efficiency itself comes from the field of engineering, which functions to show the relationship between the input of a system and the output of that system in the form of a ratio. This measurement is based on an ideal situation where the quantity of resources (input) used will produce the same amount of output.

Efficiency is obtaining a result with minimal input (Masfufah & Rahman, 2019). An activity is said to be efficient if the implementation of the activity has achieved the goal with low input. Being efficient also means eliminating waste (Banker & Morey, 1986). The ideal condition of efficiency occurs if a company or organisation can produce output in the same amount as the input used. Radityo & Arianti, (2023) stated that efficiency measurements need to be carried out, and the results of these measurements will help assess the success of a program. Additionally, budgets that have not reached the efficiency level can be improved by improving budget management (Triyanto et al., 2017). Research on the efficiency of special autonomy has been carried out by several researchers, including Prabowo et al. (2021), Ikhsan et al. (2022), and Hasibuan (2022). This research indicates that special autonomy funds have not been managed efficiently.

Furthermore, poverty can be influenced by several factors. According to the vicious circle theory of poverty, poverty is a circle that has no end (Leasiwal, 2013). The lack of capital owned by individuals causes their productivity to be low, which results in low individual income because low income causes poor people to have low savings and investments (Amaluddin, 2020; Chaudry & Wimer, 2016; Sasmal & Sasmal, 2016; Puri & Khoirunurrofik, 2021). Furthermore, this low investment will lead to low capital formation, causing underdevelopment.

Society, which is classified as poor, experiences conditions of deprivation. They cannot enjoy proper health, higher education, and nutritious food (Seran, 2017). Global development agreements such as the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) place the problem of poverty as the main development priority (Hapsari et al., 2013; Kanayo, 2014; Rahman et al., 2021). Several researchers have discussed poverty levels. Studies conducted by Bintang & Woyanti (2018), Kahar (2018), and Miranti (2017) show that accessibility to water supply, education, and infrastructure has a significant effect on the poverty rate. Poverty can be alleviated by increasing the accessibility of society to access better education, health, sanitation, and infrastructure (Amaluddin, 2020; Chaudry & Wimer, 2016; Lucci et al., 2018; Purnomo & Istiqomah, 2019; Wijaya & Suasih, 2021). Education can help society to get better jobs, health can increase productivity, and after that, it could help alleviate poverty.

Miranti's (2017) findings state that the factors influencing poverty are GRDP per capita, clean water supply, and distance from the government centre. Kahar (2018) study showed that the expected number of years of schooling as a proxy for education indicators had a negative and significant effect on poverty levels. Bintang & Woyanti (2018) findings reveal that the average length of schooling and life expectancy have a negative and significant effect, while economic growth has a positive and significant effect on poverty in Central Java.

C. METHOD

This research is a descriptive quantitative study and uses two methods to answer the research question. The method used in this research is data envelope analysis (DEA), which analyses the efficiency of special autonomy. Then, panel data regression analysis is used to investigate the effect of special autonomy on the poverty rate.

According to Gavurova et al. (2017), DEA is a mathematical programming technique used to evaluate the relative efficiency of a set of Decision-Making Units (DMU) in managing resources (inputs) of the same type to produce results (outputs). Table 1 shows the input and output variables that will be used to analyse the efficiency of Papua's special autonomy. Based on the law, allocating special autonomy funds in Papua enhances spending on education, health, and infrastructure.

Table 1. Input and Output Indicator of Special Autonomy

No	Regional Autonomy Allocation	Input	Output
1	Education	Spending on Education Function	Average Years of Schooling
2	Health	Spending on Health Functions	Life Expectancy
3	Infrastructure	Spending on Service Function	Percentage of Households with Safe Drinking Water

Source: Author, 2023

The second objective of this research is to analyse the impact of the implementation of special autonomy on the poverty rate in Papua. This study uses the panel data regression method to conduct the impact analysis. The cross-section data in this research consists of 29 regions in Papua Province, while the time series data covers 2018 – 2021. The general model for the analysis of panel data regression is as follows:

$$\text{Pov}_{it} = \beta_0 + \beta_1 \text{efisiensi}_{it} + \beta_2 water_{it} + \beta_3 \text{logahh}_{it} + \beta_4 \text{logrls}_{it} + \beta_5 \text{logbfk}_{it} + \beta_6 \text{logbfp}_{it} + \beta_7 \text{logbf}_{it} + \mu_{it} \dots\dots\dots\dots\dots\dots (1)$$

Explanation:

Pov	= Poverty Rate in Papua Province
Efisiensi	= Result of Efficiency Analysis
Water	= Percentage of Households with Safe Drinking Water
AHH	= Life Expectancy
RLS	= Average Years of Schooling
BFK	= Spending on Health Function
BFP	= Spending on Education Function
BF	= Spending on Service Function
β_0	= Constanta
$\beta_1, \beta_2, \beta_3 \dots \beta_7$	= Coefficient Regression
μ	= Error
i	= Cross-section Data of 29 Province in Papua
t	= Years (2018 – 2021)

D. RESULT AND DISCUSSION

Efficiency Result

Result of efficiency analysis on this research using VRS (Variable Return to Scale) model. This method divides output and input variables with a result value between 0 and 1. A value of 1 means that a region has reached a level of efficiency. Meanwhile, a value of less than one means that an area is inefficient. Efficiency is obtaining a result with minimal input (Masfufah & Rahman, 2019). An activity is said to be efficient if the implementation of the activity has achieved the goal with low input. Efficient also means eliminating waste (Peykani et al., 2020). The ideal condition of efficiency occurs if a company or organisation can produce output in the same amount as the input used. (Radityo & Arianti, 2023) Stated that efficiency measurements need to be carried out, and the results of these measurements will help assess the success of a program. Table 2 shows the result of special autonomy's efficiency in Papua Provinces.

Based on the efficiency analysis of the special autonomy of Papua, it can be concluded that several regions have achieved efficiency. Over the past four years, Biak Numfor Regency, Mimika, Waropen, Yalimo, and Jayapura City have achieved exceptional autonomy efficiency. In 2020, there was significant progress in efficiency as most regencies/cities in Papua Province achieved satisfactory efficiency. Nevertheless, despite the good outcomes in the efficiency rate of special autonomy in Papua, the utilisation of special autonomy funds in some regencies/cities needs further improvement to achieve the desired targets.

Table 2. Result of Efficiency Analysis Using VRS Model

Regions	2018	2019	2020	2021
Asmat	0.86	0.90	1	0.88
Biak Numfor	**1**	**1**	**1**	**1**
Boven Digoel	0.83	0.87	0.98	0.95
Deiyai	1	1	1	0.99
Dogiyai	**1**	**1**	**1**	**1**
Intan Jaya	0.90	1	1	1
Jayapura	0.93	1	1	1
Jayawijaya	0.81	0.88	0.89	0.88
Keerom	0.99	0.83	0.93	0.93
Kepulauan Yapen	0.95	1	1	1
Lanny Jaya	0.90	1	1	1
Mamberamo Raya	0.79	0.88	1	0.99
Mamberamo Tengah	0.96	1	1	0.96
Mappi	0.89	0.94	1	0.96
Merauke	0.92	0.93	1	1
Mimika	**1**	**1**	**1**	**1**
Nabire	0.94	0.95	1	1
Nduga	0.86	1	1	0.84
Paniai	0.90	1	1	1
Pegunungan Bintang	0.89	0.98	1	0.97
Puncak	1	1	1	0.98
Puncak Jaya	0.89	0.98	0.99	1
Sarmi	0.92	0.94	1	0.99
Supiori	0.90	1	1	1
Tolikara	1	1	1	0.99
Waropen	**1**	**1**	**1**	**1**
Yahukimo	0.90	1	0.98	1
Yalimo	**1**	**1**	**1**	**1**
Jayapura City	**1**	**1**	**1**	**1**

Source: Data Processing Using DEAP, 2023

Result of Panel Data Regression Analysis

According to Gujarati (2013), some tests are required to determine the best model before obtaining the best result. Referring to the Chow and Hausman test results, where the obtained probability is 0.000, the best model is the Fixed Effect Model. Table 3 in this research shows

the result of the Fixed Effect Model (FEM). Based on the result, the probability value of the F-statistic is 0,000 (less than alpha 0,01). It can be concluded that simultaneously, the independent variables in the model affect the dependent variables. Coefficient determination on this model can be shown in the adjusted R-squared value. The adjusted R-squared value is 0.99, indicating that the variation of independent variables can explain the dependent variable by 99%, while the variables outside the model explain the other 1%.

The estimation shows that four independent variables partially affect Papua's poverty rate. At the same time, the other three variables do not influence the poverty rate. The variable with the greatest effect on the poverty rate is the health variable, proxy by life expectancy.

Table 3. Result of Panel Regression Analysis

Variables	Coefficient	Probability t-Statistic
Efficiency Value	**-1.987521**	**0.0098***
Percentage of Household with Safe Drinking Water	**-0.002878**	**0.0013***
Life Expectancy	**-74.05217**	**0.0000***
Average Years of Schooling	-2.069534	0.2285
Spending on Health Functions	-0.069491	0.5929
Spending on Education Function	**-0.272723**	**0.0515***
Spending on Service Function	0.356165	0.2788
R-squared		**0.999441**
Adjusted R-squared		**0.999196**
F-statistic		**4084.069**
Prob (F-statistic)		**0.000000**

Source: Processing Data Using Eviews, 2023

In this research, the efficiency value resulted from the data processed in DEAP. According to the result, the efficiency value of special autonomy has a negative and significant effect on the poverty rate. The result indicates that every increase of 1% in the efficiency of the special autonomy fund could decrease the poverty rate by 1.92%. By the law of Indonesia, Papua Province is one region with a special autonomy fund. The special autonomy fund is given to increase society's welfare in Papua. The research results show that the efficiency of using special autonomy funds must be improved continuously to help improve people's welfare and reduce poverty.

A study from Prabowo et al. (2021b) examined particular autonomy policies and people's welfare in Papua. The research results revealed that implementing special autonomy in Papua showed low efficiency, so it could not improve welfare in Papua. Ikhsan et al. (2022a) discuss special autonomy and poverty levels in Aceh Province. The results of this research explain that special autonomy cannot overcome poverty because the efficiency of fund allocation is still low. Hasibuan (2022b) discusses special autonomy in the Provinces of Papua and West Papua. Research findings show that the poverty level in Papua and West Papua Provinces has decreased since the provision of special autonomy funds.

The purpose of granting special autonomy funds to Papua is to improve access to basic services. This study's percentage of households with safe drinking water is a proxy for access to essential services. Based on the analysis results, access to clean water has a negative and significant effect on the poverty level in Papua Province. The coefficient value of access to

clean water is 0.0028, which means that every 1% increase in access to clean water will reduce poverty by 0.0028%.

Lack of access to clean and adequate drinking water is one of the causes of various diseases, which will impact community productivity (Behera et al., 2020a). Research conducted by Hasyim & Veriyanto (2022) stated that household access to adequate drinking water significantly affects poverty levels in Indonesia. The research results show that households with inadequate access to drinking water have a 1,561 greater tendency to become poor. The study of Behera et al. (2020), Lestari et al. (2020), and Sihombing et al. 2021) provide results that adequate drinking water has a negative and significant effect on poverty levels, and this means that increasing access to sufficient drinking water can help reduce poverty levels.

Water is the primary need for the sustainability of daily economic activities. Clean water is significant for households, public places, and industry. Studies conducted by international agencies state that unsafe drinking water can be a source of various diseases. If reviewed based on BPS data for 2022, access to proper drinking water in Papua is 65.39%, which is very low compared to the national average of 91.05%. These data indicate that the drinking water in Papua Province needs to be improved.

This study uses life expectancy as a proxy for health indicators. Based on the analysis in this study, life expectancy has a negative and significant effect on the poverty rate in Papua Province. The coefficient value of life expectancy was 74.05, which means if life expectancy increased by 1%, the poverty rate could decrease by 74.05%, and vice versa. Life expectancy estimates the average how long someone in each population will live.

An increase in life expectancy is associated with an increase in the quality of health and access to better health services. BPS interprets life expectancy as a tool to evaluate government performance in improving welfare and health status. Sudaryati et al. (2021) stated that an increase in life expectancy is the good of human development. An increase in life expectancy can also indicate that a person's social condition has improved in a better direction.

Improved public health can help increase community productivity. If many people suffer from disease or have a high mortality rate, the productive workforce will decrease. People living with a high risk of death or having limited access to health services experience difficulties in achieving high social welfare. The findings in this study are in line with several previous studies which state that life expectancy hurts the poverty rate (Samudra & Wahed, 2016; Bintang & Woyanti, 2018; Melati & Suryowati, 2018; Sudaryati et al., 2021; Kevin et al., 2022). Prioritising public health improvements can help improve community performance, improve the quality of immunity, and increase production output.

In this study, the education variable is proxied by the average years of schooling. The results of the analysis show that education has a negative but insignificant effect on poverty in Papua. The average length of the school coefficient is -2.069. The results of this study contrast with the theory of human development. The theory argues that increasing human development through education can help reduce poverty levels. Spending on education as an input variable in special autonomy negatively and significantly affects the poverty level. Still, the output in the average length of schooling does not affect the poverty level. After reviewing data on the average size of education in Papua, we found that the value remains very low compared to the average length of schooling in other provinces. This can be interpreted as spending on education not being efficiently allocated (Kurniasari & Oktavilia, 2023). However, spending on education still needs to be increased, considering the efficiency of distribution to target the correct recipients, subsequently help increase the average length of schooling, and assist in reducing poverty.

Even though the average length of schooling does not affect the poverty level in Papua, improving the quality of human resources through education still needs to be improved. In his book "The End of Poverty," Jeffrey Sachs mentions that one way to reduce poverty is to

develop human resources, especially education and health. The results of this study contrast with research conducted by Rohmah et al. (2021), Okiya & Matanda (2019) and Kahar (2018). These studies found that education negatively and significantly affects the poverty rate.

Poverty alleviation is not only related to individual efforts to get out of the vicious circle of poverty but also requires intervention from the government. In Indonesia, especially in Papua province, the government provides additional funds known as special autonomy funds and additional infrastructure funds. In this case, the special autonomy funds given to Papua are used to increase spending on the education function, health, and service.

In this study, spending on education functions negatively and significantly affects Papua's poverty level. The coefficient value is 0.27, which means that a 1% increase in spending on the education function can reduce poverty by 0.27%. Spending on education is a budget spent to finance the construction of educational facilities and improve the quality of education. The research results suggest increasing spending on education in Papua Province must be prioritised. The results in this study are also in line with research conducted by Cahyaningsih & Fitrady (2019), Melati & Burhany (2021), Rumere et al. (2022)

However, in contrast to spending on the education function, in this study, spending on health and services did not affect the poverty rate in Papua. Spending on health and service functions that do not affect the poverty rate in Papua can be caused by inefficient management of funds or not meeting targets. The government needs to pay more attention to the review and budget allocation for spending on health functions and service functions. Health and public services are important aspects of human Life. Inequality or inefficient use of funds can lead to vulnerability to people's welfare. The research results contrast with Tahir et al. (2014), Pasaribu & Hendarto (2016), and Palenewen et al. (2018), which state that health spending hurts the poverty rate.

E. CONCLUSION

Based on the results of the research that has been carried out during the 2018-2021 period, several Regencies/Cities have achieved a level of efficiency in special autonomy, namely Biak Numfor Regency, Mimika, warped; Yalimo, and Jayapura City. Furthermore, the estimation in the panel data regression analysis shows that four independent variables have a negative and significant effect on the poverty rate in Papua Province, namely the variable level of efficiency, adequate drinking water, life expectancy, and spending on education functions. Based on the results, the efficiency level in using special autonomy funds in Papua Province needs to be continuously improved to achieve the expected targets. In this study, spending on health and service functions did not affect the level of poverty in Papua Province, which was indicated by the perceived lack of efficiency in budget allocations. Paying more attention to the budget allocation for education, health, and services is necessary. Coordination between institutions also needs to be improved to achieve the target. The shortcomings of this study are related to the data used and the limitation of not analysing efficiency further, such as processing potential improvements. The suggestion for researchers interested in researching the efficiency of special autonomy is to add the latest years' data and analyse efficiency more comprehensively by examining potential improvements.

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