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FISCAL POLICY AND HUMAN DEVELOPMENT: EMPIRICAL EVIDENCE FROM THE NEWLY ESTABLISHED AUTONOMOUS REGIONS IN PAPUA, 2018-2024

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ABSTRACT

The newly established Autonomous Regions (DOB) in Papua, specifically South Papua, Central Papua, and Highland Papua, continue to record the lowest Human Development Index (HDI) scores in Indonesia despite receiving significant fiscal transfers. This study aims to analyze the influence of education and health sector expenditures on HDI outcomes within these regions from 2018 to 2024. Utilizing panel data regression with a Fixed Effect Model (FEM) covering 20 regencies, the research investigates how targeted fiscal allocations translate into human development improvements in structurally complex and geographically isolated territories.

The empirical results demonstrate that Education Expenditure exerts a positive and highly significant impact on the HDI, identifying it as the primary driver for elevating knowledge dimensions such as mean years of schooling. Conversely, Health Expenditure shows no statistically significant effect on HDI within the observed timeframe. This indicates that while educational investments effectively foster human capital, health spending in the Papua DOB regions is currently obstructed by severe structural barriers, including hyper-inflationary logistical costs, critical shortages of medical personnel, and persistent security instability.

These findings imply that regional governments must prioritize mandatory educational spending through outcome-based programs, such as scholarship schemes and boarding school initiatives, to sustain long-term human development. Furthermore, for health expenditures to be effective, policymakers must transition from purely administrative budget increases toward addressing the underlying physical and geopolitical constraints that currently hinder service delivery. This study provides critical policy insights for regional authorities and the central government to enhance the quality of fiscal management and ensure that public spending generates tangible improvements in the welfare of the Papuan community.

Keywords: Fiscal Policy, Human Development Index (HDI), Education Expenditure, Health Expenditure, Papua DOB.

BACKGROUND

The Human Development Index (HDI) serves as a primary indicator for assessing regional developmental success, reflecting the quality of human resources and community welfare (Fahrurrozi et al., 2023). According to the United Nations Development Programme (UNDP), HDI incorporates key dimensions including longevity, health, knowledge, and a decent standard of living (Badan Pusat Statistik, 2025). While Indonesia achieved a high national HDI score of 75.02 in 2024, this aggregate progress masks significant regional disparities in access to education and health services. Such gaps indicate that economic growth has not yet been equitably distributed across all provinces, particularly in the Papua region.

The recently established Autonomous Regions (DOB) in Papua, specifically South Papua, Central Papua, and Highland Papua, face persistent structural challenges characterized by the lowest HDI scores nationally. Despite receiving substantial Special Autonomy (Otsus) funds intended for education and healthcare, these regions struggle to accelerate human development. This ongoing paradox between massive fiscal transfers and low human development outcomes suggests that the mere availability of funds does not automatically translate into improved quality of life without effective management.

Government expenditure in education is a critical investment for enhancing human capital, specifically aiming to improve indicators like expected years of schooling (Kurnia et al., 2023). National regulations mandate that regional governments allocate at least 20 percent of their budgets to the education sector (Badan Pusat Statistik, 2025). Theoretically, optimized spending in this sector promotes higher productivity and long-term societal growth. However, empirical evidence shows that high budget allocations do not consistently result in significant HDI gains, particularly when implementation quality is hampered by regional inefficiencies.

Similarly, health sector expenditure is a fundamental pillar for increasing life expectancy, a core component of the HDI (Kurnia et al., 2023). Effective health spending can improve community well-being, yet its direct impact on HDI remains a subject of academic debate due to highly variable implementation results (Rosyid et al., 2025). In the Papua DOB context, geographical isolation, high logistical costs, and inadequate infrastructure frequently limit the efficiency of these health funds. Consequently, simply increasing budget proportions often fails to yield tangible improvements in local healthcare access or overall human development (Suryani et al., 2025).

Given these inconsistent findings in existing literature, there is a clear research gap regarding the impact of these sectoral expenditures in the unique context of the newly expanded Papua provinces (Ahmat et al., 2025). While some studies report positive correlations, others observe insignificant or negative outcomes, suggesting that the relationship is highly context-dependent (Lubis et al., 2024). This study addresses these discrepancies by specifically analyzing the influence of education and health sector expenditures on HDI within 20 regencies across the Papua DOB from 2018 to 2024. By focusing on this specific timeframe and region, this research aims to provide clearer insights into the effectiveness of fiscal policy in overcoming structural developmental barriers.

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THEORETICAL FRAMEWORK

Fiscal Decentralization and Human Development

Fiscal decentralization theory explains the delegation of financial management authority from the central government to regional governments to enhance public service efficiency and development equality. This process includes authority over expenditures, revenues, and fiscal decision-making (World Bank, 2020). OECD emphasizes that decentralization must be supported by a clear policy framework to improve resource allocation efficiency (OECD, 2019). Regional governments utilize this authority to manage resources according to local needs, which is essential for accelerating regional development and improving public services.

The Human Development Index (HDI) serves as a comprehensive metric to assess regional developmental success based on quality of life, extending beyond mere economic growth (UNDP, 2020). HDI incorporates three primary dimensions: longevity, knowledge, and a decent standard of living, making it an inclusive measure of social and economic capabilities (Kuncoro, 2018). In Indonesia, HDI is a primary indicator used to classify regional development success, reflecting improvements in access to health, education, and purchasing power (Prastiwi & Handayani, 2024). Thus, the theory of fiscal decentralization provides the structural basis for regions to prioritize the social sectors that drive these HDI dimensions.

Sectoral Spending Impacts on Human Development

Education expenditure is a strategic long-term investment that directly influences the knowledge dimension of HDI, such as mean years of schooling (Kurnia et al., 2023). These expenditures are intended to increase community productivity through high-quality educational facilities and systems. Empirical findings confirm that when regional governments effectively prioritize education budgets, it significantly elevates human capital and HDI scores (Damayanti & Suryaningrum, 2023). However, the effectiveness of this spending is highly dependent on budget management and the quality of policy implementation at the local level.

Health sector expenditure is a fundamental pillar for increasing life expectancy, a core component of the HDI (Kurnia et al., 2023). Effective health spending can improve community well-being and overall quality of life, yet its direct impact on HDI remains inconsistent due to variations in implementation quality (Rosyid et al., 2025). In regions with severe geographical challenges, such as Papua, health expenditure may fail to yield significant HDI improvements unless supported by efficient budget management and equitable service distribution (Suryani et al., 2025). Therefore, health spending must be coupled with effective management to successfully translate fiscal inputs into better health outcomes.

METHOD

This research adopts a quantitative approach, utilizing panel data regression to examine the impact of sectoral public expenditures on human development outcomes across 20 regencies within the newly established Autonomous Regions (DOB) of Papua. The unit of analysis comprises these 20 regencies, observed over a seven-year period from 2018 to 2024,

resulting in 140 total observations. This longitudinal perspective is essential for capturing the fiscal dynamics and developmental transitions occurring within these regions following their administrative formation. The data utilized in this study are secondary, sourced from official documentation provided by the Central Statistics Agency (BPS) and the Directorate General of Fiscal Balance (DJPK) of the Ministry of Finance.

The variables are operationally defined to ensure precise empirical measurement, consisting of the Human Development Index (IPM) as the dependent variable, alongside Education Expenditure and Health Expenditure as the primary independent variables. The dependent variable is measured by the composite HDI score published annually by BPS. Education Expenditure is measured as the percentage ratio of realized education spending to the total regional expenditure. Health Expenditure is measured as the percentage ratio of realized health spending to the total regional expenditure.

The data analysis technique applied is panel data regression, processed using EViews version 10 software to accommodate the combination of cross-sectional and time-series data. To determine the most robust estimation model, a systematic selection process is executed. The Chow Test is primarily conducted to select between the Pooled Least Square (Common Effect Model) and the Fixed Effect Model. Subsequently, the Hausman Test is employed to decide between the Fixed Effect Model and the Random Effect Model, ensuring the selected model accurately captures the unobserved heterogeneity across the respective regencies.

Prior to hypothesis testing, classical assumption tests tailored for panel data characteristics are conducted to detect any potential deviations that might affect the model's reliability. The hypothesis testing procedure utilizes the t-test at a 5% significance level to evaluate the partial significance of both education and health expenditures on the HDI, applying this standard to minimize statistical errors. Additionally, the F-test is utilized to assess the simultaneous effect of the independent variables on the dependent variable. Finally, the Adjusted Coefficient of Determination (Adjusted R^2) is analyzed to measure the proportion of variance in the HDI that can be explained by the designated sectoral expenditures within the model.

RESULTS

Descriptive Statistical Analysis

The descriptive statistical analysis provides a comprehensive overview of the data distribution for the variables observed across 20 regencies within the newly established Autonomous Regions (DOB) of Papua from 2018 to 2024. The Human Development Index (HDI) reports a mean score of 54.23, reflecting the average level of human development across the observed sample. The data reveals a significant disparity, with a minimum HDI score of 29.42 recorded in Nduga Regency and a maximum of 76.85 in Mimika Regency. This variation is further confirmed by a standard deviation of 9.93, indicating that human development progress remains highly inconsistent among the sampled regencies.

Regarding fiscal allocations, Education Expenditure exhibits an average allocation of 12.58 percent of the total regional budget. The observed range is substantial, spanning from a

minimum of 2.76 percent to a maximum of 36.93 percent. This wide distribution suggests that local governments prioritize educational investment with varying degrees of intensity across the region. The standard deviation of 0.055 indicates moderate variability in how these regencies commit financial resources toward educational infrastructure and services.

Health Expenditure records a mean allocation of 12.95 percent of the total regional budget, which is slightly higher than the average for education. However, the data also shows a stark minimum allocation of just 0.02 percent, compared to a maximum of 25.81 percent. This extreme range highlights that, despite a similar average allocation to education, health funding is distributed highly unevenly. With a standard deviation of 0.041, the data suggests that most regencies maintain a relatively similar health budget proportion, yet critical underfunding persists in specific areas.

Panel Data Regression and Hypothesis Testing

The model estimation was performed using panel data regression, with the Fixed Effect Model (FEM) selected as the optimal structure following rigorous Chow and Hausman tests. The regression results demonstrate that Education Expenditure significantly influences human development, evidenced by a positive coefficient of 23.86999 and a probability value of 0.0000. Since this probability value is strictly below the 0.05 threshold, the hypothesis stating that education spending has a positive effect on HDI is statistically accepted. This confirms that increasing educational budget proportions is a primary driver for improving HDI scores in the Papua DOB regions.

Conversely, the regression analysis for Health Expenditure yields a coefficient of -1.44692 and a non-significant probability value of 0.7785. Because this probability exceeds the 0.05 significance level, the hypothesis proposing a significant effect of health spending on HDI is rejected. This suggests that within the Papua DOB context, variations in health budget proportions did not yield a statistically significant direct impact on HDI fluctuations during the study period. The data indicates that current health spending strategies may face structural impediments that prevent them from translating into immediate improvements in human development metrics.

The overall explanatory power of the model is robust, as indicated by the Adjusted R-squared value, which confirms that Education and Health Expenditures account for a vast majority of the variance in HDI. While education emerges as a highly effective driver of human development, the insignificant results for health expenditure highlight a critical area for policy re-evaluation. The remaining small fraction of unexplained variance suggests that other factor, such as logistical barriers, regional security, and quality of governance, continue to exert influence over HDI outcomes beyond what is captured by sectoral spending alone.

DISCUSSION

The Effect of Education Expenditure on the Human Development Index

The empirical finding that education expenditure yields a positive and highly significant effect on the Human Development Index (HDI) firmly validates the Human Capital Theory, which posits that education acts as a critical investment in human resources. Within the context

of the Papua DOB, educational spending serves as a strategic long-term instrument for enhancing community knowledge, directly elevating indicators such as mean years of schooling and expected years of schooling (Mardiasmo, 2019). By prioritizing these allocations, regional governments address the foundational knowledge dimension of the HDI, effectively translating fiscal input into tangible human capacity improvements.

The substantial positive coefficient observed in this study underscores the effectiveness of targeted educational interventions, such as the scholarship programs and boarding school initiatives in regencies of Papua. The data confirms that when financial resources are channeled into critical educational programs, they generate a positive impact that is immediately reflected in the regional HDI scores.

These results align with the broader consensus in existing literature, which consistently identifies education spending as a primary driver of human development (Damayanti & Suryaningrum, 2023; Nursita et al., 2025). Given the high significance of this relationship, local governments are encouraged to maintain or increase their commitment to education, ensuring that budget allocations meet the mandatory constitutional requirements. Addressing the educational needs of the significant out-of-school population in Papua remains the most reliable path for regional authorities to ensure long-term, sustainable human development (Sucahyo, 2023).

The Effect of Health Expenditure on the Human Development Index

The statistical rejection of the health expenditure hypothesis indicates that, within the Papua DOB context, health budget allocations did not exert a significant direct impact on HDI during the 2018-2024 period. While the Human Capital Theory suggests that health spending should improve longevity and life expectancy, the empirical reality in these regions demonstrates that financial input alone is insufficient to guarantee development outcomes. This finding reveals a critical gap where budgetary support fails to overcome entrenched structural impediments, resulting in a disconnect between fiscal policy and community well-being.

Several factors contribute to this insignificance, most notably the severe geographical isolation and extreme logistical costs that characterize the Papua highland regions. As indicated by the high Construction Cost Index (IKK), a substantial portion of the health budget is absorbed by the costs of transporting medical supplies and personnel via air, rather than being utilized for actual service delivery (Sarjito, 2024). Furthermore, the persistent threat of geopolitical instability and armed conflict often renders health facilities unusable and forces the evacuation of medical staff, effectively neutralizing the intended impact of the allocated funds (Situmorang, 2025).

These findings are consistent with previous research that highlights the limited effectiveness of health spending in the absence of broader structural support (Prastiwi & Handayani, 2024; Simamora et al., 2024; Amrullah, 2022). Consequently, simply increasing the budget is unlikely to yield results unless local governments simultaneously address the logistical and security challenges that hinder the delivery of healthcare services. To improve health outcomes, policymakers must shift their focus from purely administrative budget

increases toward strategies that ensure physical access to medical care and guarantee the safety of healthcare providers in remote areas (Suryani et al., 2025).

CONCLUSION

This study concludes that sectoral public expenditure plays a varying role in shaping human development outcomes within the newly established Autonomous Regions (DOB) of Papua between 2018 and 2024. Education expenditure is empirically validated as a significant and positive driver of the Human Development Index (HDI), confirming that targeted investment in the education sector acts as a highly effective catalyst for improving societal knowledge dimensions. Conversely, health expenditure does not exhibit a statistically significant direct impact on HDI fluctuations within the observed period. This discrepancy suggests that while educational investment effectively translates into tangible human capacity growth, fiscal allocations toward the health sector face structural impediments that obstruct the achievement of desired developmental outcomes.

The implications of these findings are substantial for regional fiscal policy, reinforcing the validity of the Human Capital Theory by demonstrating the profound impact of educational investment. Regional governments are strongly encouraged to prioritize mandatory constitutional spending on education and to focus on outcome-based interventions, such as scholarship programs and boarding school initiatives, which have proven successful in overcoming geographic barriers. Regarding the health sector, the findings suggest that budget increases alone are insufficient to yield development improvements. Policymakers must move beyond simple budget augmentation and actively address the logistical hurdles, infrastructure shortages, and security concerns that currently hinder the delivery and quality of healthcare services in remote areas.

Despite its contributions, this study is subject to several limitations that should be noted for future research. The research was constrained by focusing solely on two fiscal variables, education and health spending, which leaves out other essential developmental determinants such as infrastructure investments, security indices, and governance quality. Furthermore, the seven-year observation period may be insufficient to capture the full, long-term realization of human capital investments, which naturally require more time to mature. Future research should aim to broaden the model by including additional structural variables and employing longitudinal approaches to better understand the multifaceted drivers of human development in politically and geographically complex regions like Papua.

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