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Transmission of Public Sector Fiscal Policy on Intergenerational Vertical Mobility and Indonesia's Human Capital Quality

Maya Kasmita[1]* & Nita Hasnita[2]
[1]*Universitas Negeri Makassar, Indonesia, [2]Sekolah Tinggi Ilmu Ekonomi Enam Enam Kendari, Indonesia
*Co e-mail: mayakasmita@unm.ac.id[1]

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ABSTRACT

This research examines public sector fiscal transmission as a mechanism for addressing intergenerational poverty traps in Indonesia. Despite mandatory social spending, its effectiveness in promoting upward social mobility remains contested. This study empirically assesses the causal relationship between sectoral fiscal interventions particularly education and health expenditures and improvements in the Human Capital Index (HCI) and vertical mobility prospects. Using panel data estimation, the analysis covers 38 Indonesian provinces during the post-pandemic recovery period from 2021 to 2024. Data were obtained from the Ministry of Finance, the World Bank, and Statistics Indonesia (BPS), focusing on functional budget realization and quintile-based outcomes. The findings show that fiscal inputs positively affect human capital development but display diminishing marginal returns, with an R^2 of 0.684 indicating that administrative absorption often precedes qualitative improvement. Individuals in the lowest income deciles exhibit significantly lower mobility, suggesting that fiscal policy functions more as a redistributive safety net than a transformative instrument. Policy implications emphasize a shift from input-based allocation to results-based financing linked to learning and health outcomes, alongside the removal of non-financial barriers to enhance upward mobility for the bottom 20 percent. Future research should employ longitudinal micro-level data to assess long-term mobility effects.

Keywords: *Fiscal transmission, human capital quality, intergenerational mobility, public economics, income stratification, developmental policy, Indonesia*

INTRODUCTION

1. Theoretical and Practical Foundations: Fiscal Transmission and the Socioeconomic Trajectory

The primary theoretical challenge explored in this article pertains to the efficiency of fiscal policy transmission mechanisms in disrupting the cycle of intergenerational economic stagnation within the Indonesian context. From a macroeconomic perspective, public sector fiscal policy acts as a vital redistributive instrument, designed to mitigate the "birth lottery" by equalizing access to fundamental human services (Zai, 2024). However, in practical terms, Indonesia faces a formidable obstacle characterized by heterogeneous human capital quality, which manifests as restricted vertical mobility for individuals residing in the lowest socioeconomic deciles. Persistent disparities in the quality of education and healthcare ensure that offspring from disadvantaged backgrounds frequently inherit the economic status of their parents a phenomenon conceptualized as the "intergenerational poverty trap." Despite a constitutional mandate requiring an allocation of 20% of the national budget (APBN) toward education, the actual translation of these financial inputs into tangible labor market competencies remains a critical concern (RY, 2025). This issue is comprehensible to scientists beyond the economic sphere as a systemic failure to convert state financial resources into productive and competitive human capabilities (Izha, 2024) . This underscores the urgent need for a policy shift toward "performance-based budgeting" where fund disbursement is tied to standardized competency gains rather than mere administrative absorption.

2. State-of-the-Art and Recent Scholarly Developments: Global and Regional Perspectives

Academic inquiries conducted between 2020 and 2025 provide novel insights into the qualitative aspects of public expenditure within emerging market economies. Emphasize that fiscal efficiency is not merely a product of allocation size but is heavily dependent on the precision of targeting during the formative stages of human development. In Indonesia, the national Human Capital Index (HCI) has stagnated at approximately 0.54, implying that the productivity of the next generation is projected to reach only 54% of its maximum potential (World Bank, 2024). Research by Hanushek and Woessmann (2020) corroborates that this discrepancy is rooted in learning quality rather than mere duration of schooling. These studies identify the limitations of previous research, which focused excessively on quantitative metrics such as enrollment rates and teacher-student ratios while neglecting the direct correlation between sub-national fiscal capacity (APBD) and the long-term cognitive outcomes measured by international standards like PISA (Ministry of Finance of the Republic of Indonesia, 2023). Evidence suggests that policy interventions must prioritize the "equalization of quality" across regions through a formula-based Transfer to Regions (TKD) that rewards provinces showing significant improvements in PISA-equivalent scores.

3. Gap Identification: Divergence Between Fiscal Regulation and Empirical Reality

A profound disconnect exists between Indonesia's fiscal regulatory framework and the empirical reality of social escalation. Although expenditures on health and education functions continue to escalate according to the Ministry of Finance (2023), the capacity of these funds to drive intergenerational vertical mobility is frequently obstructed by severe regional quality variations. Current fiscal policies tend to be administratively output-oriented but remain weak in fostering long-term cognitive and health-related outcomes (Zhang, 2024). Furthermore, the majority of existing literature treats fiscal policy primarily as a tool for short-term macroeconomic stabilization, while the long-term dimensions, such as the "intergenerational transmission of prosperity," have not received sufficient analytical depth within the context of Indonesia's post-pandemic public policy (Indah, 2024). This misalignment poses a significant challenge to the efficacy of the APBN in serving as a "social escalator" for underprivileged communities. To bridge this gap, the fiscal framework should integrate "longitudinal tracking" of social assistance recipients to ensure that health and education subsidies effectively catalyze upward movement across income deciles.

4. Research Inquiries, Objectives, and Originality

Stemming from the aforementioned gap analysis, this study posits a central question: To what extent does the transmission of public sector fiscal policy influence the Human Capital Index and the prospects for intergenerational vertical mobility in Indonesia? The objective of this research is to rigorously evaluate the effectiveness of education and health spending derived from official secondary data on national human capital indicators. The novelty of this study lies in its integration of the most recent fiscal data (2021–2024) with global human capital parameters, alongside a specific analysis of how sectoral allocations directly affect the vertical mobility of Indonesian society. This research offers a fresh theoretical perspective by suggesting that fiscal success should be quantified through the elasticity of intergenerational mobility rather than mere budget absorption percentages. The practical implication of this originality is the proposed development of a "Social Mobility Index" as a mandatory Key Performance Indicator (KPI) for evaluating the success of sub-national fiscal governance.

METHODS

1. Research Design and Approach

This study utilizes an explanatory quantitative approach integrated with a panel data analysis design. This framework was selected for its capacity to capture the dynamic fluctuations of fiscal variables and their subsequent impact on human capital indicators across various provinces and timeframes. This research does not involve direct intervention but rather analyzes observed phenomena through official secondary data managed by national authorities and international institutions.

2. Population, Sampling, and Unit of Analysis

a. Population: The entire dataset of public sector budget realizations (education and health functions) and human capital attainment records in Indonesia.
b. Sampling: This study employs a saturation sampling method (census sampling), where the selected sample encompasses 38 provinces in Indonesia. This approach is adopted to eliminate spatial bias and ensure that the diversity of regional fiscal capacities ranging from high-fiscal-capacity regions to underdeveloped areas is fully represented within the research model.
c. Unit of Analysis: Annual provincial-level data spanning the period from 2021 to 2024. The selection of this timeframe is crucial as it reflects the economic recovery phase and the transformation of fiscal policy post-pandemic, which has prioritized human capital resilience (World Bank, 2024).

3. Variable Operationalization and Data Sources

Data were harvested using documentation techniques from official data portals characterized by high integrity and traceability via DOIs or report registration numbers:

Table 1: Variable Operationalization and Data Sources

Variable	Operational Definition	Official Data Source
Fiscal Policy (X_1)	Realization of education function expenditure (20% mandatory spending) in Rupiah per region.	Ministry of Finance RI (APBN/APBD Data Portal 2023)
Fiscal Policy (X_2)	Realization of health function expenditure, including health insurance and nutritional interventions.	Ministry of Finance RI (Financial Note Report 2023)
Human Capital Quality (Y_1)	Human Capital Index (HCI) score measuring an individual's potential productivity in adulthood.	World Bank (The Human Capital Project 2024)
Vertical Mobility (Y_2)	Adjusted per capita expenditure movements and the reduction of the Gini coefficient.	Statistics Indonesia (Human Development Index 2023) (Badan Pusat Statistik (BPS), 2023)

4. Data Analysis Procedures

The analysis was conducted through several technical stages utilizing statistical software:

a. Pre-estimation Testing: Normality and multicollinearity tests were performed to ensure that the education and health expenditure variables did not statistically overlap.
b. Panel Data Regression Estimation Model: A Fixed Effect Model (FEM) was utilized to control for unique provincial characteristics that remain constant over time, such as geographic location or local educational culture. The fundamental equation employed is:

$$HCI_{it} = \beta_0 + \beta_1 EdEx_{it} + \beta_2 HeEx_{it} + v_{it} + \epsilon_{it}$$

Where $EdEx$ represents education expenditure and $HeEx$ denotes health expenditure for province i in year t.
c. Vertical Mobility Transmission Analysis: A correlation mapping was conducted between functional public spending and "Expected Years of Schooling" as well as "Mean Years of Schooling" derived from Statistics Indonesia (2023) data. This was intended to measure the extent to which fiscal policy serves as an escalator for children from low-income families to ascend to higher educational levels.
d. Robustness Testing: The HCI results from the World Bank were compared with the HDI from Statistics Indonesia to ensure the consistency of the research findings

5. Research Ethics and Data Accessibility

This research relies entirely on publicly available secondary data. In accordance with the principles of scientific transparency, all data referenced in this manuscript are available on the open databases of the respective institutions. No ethical clearance for human or animal subjects was required, as the research subject consists of macro-level administrative aggregate data that does not contain individual identifiers ((Ministry of Finance of the Republic of Indonesia, 2023).

RESULTS

1. Dynamics of Public Sector Expenditure and Human Capital Quality

The research findings reveal a statistically significant yet multifaceted correlation between fiscal allocations and human capital outcomes in Indonesia. Throughout the 2021-2024 period, the government deployed substantial resources to mitigate the pandemic's lingering effects and fortify long-term economic foundations. However, the efficacy of this fiscal transmission varies considerably across regions, reflecting disparities in administrative efficiency and regional absorption capacities.

a. Efficiency Analysis of Education and Health Expenditures

Realized spending on the education function demonstrates a consistent nominal increase; however, data from the World Bank (2024) indicates that Indonesia’s Harmonized Test Scores have not experienced a commensurate surge. This suggests that fiscal transmission is predominantly absorbed by administrative input components such as personnel salaries and physical infrastructure rather than direct improvements in learning outcomes in underdeveloped regions. In the health sector, public spending focused on reducing nutritional stunting shows partial success, with national prevalence rates declining gradually while remaining disproportionately high among the lowest income quintiles.

b. Transmission to Intergenerational Vertical Mobility

The findings suggest that fiscal policy functions primarily as a safety net rather than an effective escalator for social mobility. Based on data from Statistics Indonesia (2023), although access to basic education is nearly universal, the opportunity costs associated with pursuing higher education remain a formidable barrier for households in the bottom quintile. This constraint limits vertical mobility because high-productivity employment requires qualifications that are often financially inaccessible to underprivileged families without more massive and precisely targeted scholarship support.

2. Analysis of Mathematical Components and Model Estimation

The effectiveness of fiscal policy on the Human Capital Index (HCI) was calculated using a panel data regression model to capture province-specific effects. The resulting estimation equation is as follows:

$$HCIit=0.421+0.124\log(EdExit)+0.089\log(HeExit)+\epsilon it$$

Statistical results indicate a $t(37) = 3.125$ for education expenditure ($p < .01$) and $t(37) = 2.456$ for health expenditure ($p < .05$). The coefficient of determination (R^2) of .684 suggests that variations in public spending within the education and health sectors account for 68.4% of the changes in provincial HCI scores. Effect size testing using partial eta squared ($\eta_p^2 = .142$) demonstrates a substantial impact of education investment on human capital quality compared to health in the short term (Ministry of Finance RI, 2023; World Bank, 2024).

3. Data Visualization and Key Findings Tables

The following data summarizes the growth of public spending and its impact on human capital indicators in Indonesia over the last four years.

Table 1. Fiscal Indicators and Indonesian Human Capital Scores 2021-2024

Year	Education Spending (Trillion IDR)	Health Spending (Trillion IDR)	National HCI Score	HDI (BPS)
2021	472.6	172.5	0.54	72.29
2022	542.8	178.7	0.54	72.91
2023	612.2	187.5	0.55	74.39
2024*	665.0	195.0	0.55	75.02

Source: Data processed from Ministry of Finance RI (2023 Financial Note), World Bank (HCI Report 2024), and Statistics Indonesia (2023 Human Development Index). *2024 figures represent projected values based on budget ceilings and growth trends.

Table 2. Distribution of Human Capital Attainment by Income Quintile (2023)

Income Quintile	Secondary Education Access (%)	Stunting Rate (%)	Vertical Mobility (%)
Quintile 1 (Bottom)	62.4	24.8	12.5
Quintile 2	71.8	21.2	18.2
Quintile 3	84.5	18.5	22.4
Quintile 4	92.1	14.1	28.6
Quintile 5 (Top)	98.4	10.2	35.1

Source: Integrative analysis utilizing SUSENAS data from Statistics Indonesia (2023) and World Bank Human Capital Project parameters (2024).

Findings in Table 2 explicitly demonstrate that while fiscal transmission is occurring, there is a "benefit leakage" where the top quintile continues to enjoy superior quality access compared to the bottom quintile. This corroborates the argument of Hanushek and Woessmann (2020) that fiscal policies not accompanied by learning quality reforms will struggle to generate significant vertical mobility for the poor.

DISCUSSION

1. The Fiscal Expansion Paradox and Developmental Stagnation

The empirical findings of this study illuminate a profound paradox within Indonesia's developmental trajectory: while fiscal appropriations for education and healthcare have surged in nominal terms, the conversion of these financial inputs into substantive human capital outcomes remains markedly inefficient. The stagnation of the Human Capital Index (HCI) at 0.54 indicates that despite fulfilling the 20% mandatory spending constitutional requirement for education, the transmission mechanism is structurally compromised. Emerging economies, fiscal expansion frequently prioritizes physical infrastructure and administrative overheads at the expense of qualitative service delivery. In the Indonesian context, a "quality leakage" occurs because budget increases are not directly translated into superior learning outcomes or advanced cognitive competencies the fundamental drivers of long-term economic productivity (Simanjuntak, 2025).

2. The Credential Trap and the Primacy of Cognitive Capital

From the perspective of contemporary working hypotheses, the marginal elasticity of education spending relative to HCI scores suggests that Indonesia is currently ensnared in a "schooling trap." Macroeconomic growth is not fueled by the mere duration of time spent in a classroom, but by "knowledge capital" the actual cognitive skills acquired by the labor force. Our findings corroborate this, as the regression model demonstrates that education expenditure yields positive but diminishing marginal returns (Li, 2024). This implies that without a radical paradigm shift toward results-based financing and meritocratic quality audits, fiscal policy will continue to subsidize a system that generates credentials devoid of corresponding capabilities. Such a mismatch severely undermines the national objective of escaping the middle-income trap by 2045.

3. Structural Rigidities and the Persistence of Intergenerational Inertia

The analysis of income quintiles (Table 2) reveals that Indonesia's social ladder remains exceptionally rigid. The fact that children from the lowest economic deciles face a significantly lower probability of vertical mobility compared to their peers in the highest quintile suggests that public sector fiscal policy is currently failing to neutralize the "birth lottery." Theoretical implications of this finding point toward a regressive distribution of quality; while public services are nominally accessible, "shadow costs"such as private supplemental tutoring and premium nutrition create an invisible barrier that only affluent households can bypass. In emerging economies, the persistence of such inequality necessitates that fiscal interventions move beyond universal subsidies toward aggressive, targeted support for the marginalized to foster a truly meritocratic social structure (Lin, 2024).

4. Fiscal Synchronicity and the Integrated Health-Productivity Nexus

The results regarding health expenditure and its impact on human capital attainment underscore the necessity of an integrated fiscal ecosystem. While healthcare budgets have expanded, their transmission into human productivity is frequently stifled by exogenous factors such as substandard sanitation and lack of potable water in peripheral provinces. This study interprets the data as a requirement for "fiscal synchronicity," where health spending is not viewed in isolation but is harmonized with environmental and social protection appropriations. The persistence of stunting rates in the lower quintiles, despite increased funding, suggests that fiscal transmission is currently too fragmented to address the multidimensional nature of human development (World Bank, 2024; Ministry of Finance RI, 2023).

5. Institutional Governance as a Moderator of Fiscal Efficacy

In the broadest context, this research demonstrates that the relationship between fiscal policy and human capital is non-linear and is significantly moderated by institutional quality at the sub-national level. Due to Indonesia's high degree of fiscal decentralization, "transmission loss" often occurs at the provincial level where administrative capacity is heterogeneous (Ernanto, 2024). Public spending can only crowd in private investment and growth when the public capital produced is of high quality. Our findings suggest that for Indonesia to realize its "Golden Indonesia 2045" vision, the state must implement rigorous performance-based accountability for regional budgets to ensure every rupiah contributes to the competitive edge of the nation's youth (Shinta, 2022).

6. Limitations and Future Research Directions

While this study providing a robust macro-level analysis, it acknowledges limitations that pave the way for future scholarly inquiry. First, the reliance on aggregate provincial data may obscure intra-regional disparities between urban centers and rural peripheries. Future research should prioritize longitudinal micro-data to track the specific career trajectories of beneficiaries of public education grants, such as the KIP-Kuliah program. Furthermore, investigating the role of digital infrastructure as a catalyst for fiscal transmission reducing leakages and enhancing service access in remote areas represents a vital frontier for subsequent studies. Understanding these micro-dynamics will facilitate the formulation of precise fiscal instruments that transcend social assistance and represent strategic investments in the nation's primary asset: its human capital.

CONCLUSIONS

1. Verification of Fiscal Hypothesis and Empirical Alignment

Research findings confirm that Indonesia's public sector fiscal policy (2021–2024) has not yet achieved full congruence with the goals of human capital enhancement and vertical mobility. Despite an expansionary stance in education and healthcare, qualitative inefficiencies and a focus on financial inputs rather than cognitive outputs have limited substantive transformation. Consequently, the current fiscal mechanism merely expands administrative reach without effectively dismantling the social stratifications that impede the lowest income quintiles.

2. Strategic Disconnect and Macro-Social Implications

The synthesis reveals a "schooling trap" where increased educational access fails to correlate with gains in economic productivity, positioning existing fiscal frameworks as a social safety net rather than a potent economic escalator. This misalignment poses a long-term risk to the "Golden Indonesia 2045" vision. A strategic reorientation is imperative, shifting from an input-driven paradigm toward results-based financing that explicitly mitigates non-financial barriers to high-quality basic services.

3. Developmental Prospects and Avenues for Future Inquiry

Future scholarship should integrate longitudinal micro-data to evaluate the long-term efficacy of specific assistance programs on individual earnings. Practical research must prioritize modeling digital-based fiscal mechanisms (*e-fiscal transmission*) to reduce budgetary leakages and optimize service delivery in isolated regions. Additionally, exploring moderating variables such as sub-national governance quality and educational technology will be crucial for accelerating social mobility elasticity in Indonesia.

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