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DOES RISK MANAGEMENT CATALYZE THE IMPACT OF GOVERNMENT SPENDING ON HUMAN DEVELOPMENT QUALITY? EVIDENCE FROM INDONESIA

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A B S T R A C T

This study examines whether risk management catalyzes the impact of local government spending on human development quality in Indonesia, while analyzing spatial disparities between Western and Eastern Indonesia. We utilize a set of unbalanced panel data from all Indonesian district/cities local governments during 2021-2023 with a total of 1,444 observations. We discover that human development quality in Indonesia still experiences significant diparities between west and east Indonesia region. The empirical findings demonstrate that government education and economic expenditures, along with risk management deliver positive impact on human development quality. However, government healthcare spending does not exhibit any significant impact. Moreover, we also reveal that risk management exhibits no significant moderating role in the relationship between government spending and human development quality in Indonesia, suggesting that risk frameworks currently operate in bureaucratic compliance rather than as strategic catalyst. This study concludes that expanding fiscal volume alone is insufficient to elevate human development. The government pay more attention to value-for-money governance in realizing government spending, not merely focused on volume-based mandatory spending framework.
Keywords: local government, human development, government spending, risk management

Penelitian ini menguji apakah manajemen risiko mengatalisasi pengaruh belanja pemerintah daerah terhadap kualitas pembangunan manusia di Indonesia, sekaligus menganalisis ketimpangan spasial antara Indonesia Bagian Barat dan Bagian Timur. Penelitian ini menggunakan data panel dari seluruh pemerintah daerah kabupaten/ kota di Indonesia selama periode 2021-2023 dengan total 1.444 observasi. Penelitian ini menemukan bahwa kualitas pembangunan manusia di Indonesia masih mengalami ketimpangan yang signifikan antara wilayah Indonesia Barat dan Timur. Temuan empiris menunjukkan bahwa belanja pemerintah di bidang pendidikan dan ekonomi, serta manajemen risiko, memberikan dampak positif terhadap kualitas pembangunan manusia. Namun, belanja pemerintah di bidang kesehatan tidak menunjukkan pengaruh yang signifikan. Selain itu, penelitian ini juga mengungkapkan bahwa manajemen risiko tidak menunjukkan peran moderasi yang signifikan dalam hubungan antara belanja pemerintah dan kualitas pembangunan manusia di Indonesia. Hal ini mengindikasikan bahwa kerangka kerja risiko saat ini baru beroperasi sebatas kepatuhan birokrasi, bukan sebagai katalis strategis. Penelitian ini menyimpulkan bahwa memperbesar volume fiskal saja tidak cukup untuk meningkatkan pembangunan manusia. Pemerintah harus memberikan perhatian lebih pada tata kelola value-for-money dalam realisasi belanja pemerintah, dan tidak hanya berfokus pada kerangka kerja mandatory spending yang berbasis proporsi.
Kata kunci: *pemerintah daerah, pembangunan manusia, belanja pemerintah, manajemen risiko*

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INTRODUCTION

Human development in Indonesia still becomes a significant issue within the national development (Miranti & Mendez-Guerra, 2020; Saragih, 2022). There are still various issues in the field of public education, health, economy, and quality of living. Indonesia only transitioned from the medium to high human development index (HDI) category in 2016, while countries such as Singapore and Malaysia had already reached this level much earlier (UNDP, 2024). According to the United Nation Development Program (UNDP)

report (2024), Indonesia's HDI score is 0.713, ranking sixth in ASEAN and still below the regional average, lagging behind countries such as Singapore, Malaysia, and Thailand that already surpassed 80. However, at the one of the most important issue related to the achievement of human development in Indonesia is the slowing growth rate for the past several years (Saragih, 2022). In addition, as one of the largest countries in the world with archipelago nature, there is also significant disparity in human development achievement across geographic regions in Indonesia that brings the issue even further (Miranti & Mendez-Guerra, 2020).

Accelerating human development quality requires a multi-dimensional approach influenced by various systemic factors, including infrastructure availability and technological adoption (Acheampong et al., 2022), institutional quality (Filippidis & Katrakilidis, 2015), and socio-economic empowerment (Reyes & Useche, 2019). Among these determinants, government intervention plays the most central role as the primary custodian of public mandate, responsible for converting societal needs into actionable welfare strategies . To operationalize this governance role, government spending serves as the main instrument in supporting human development, particularly in the education, health, and economic sectors (Liu et al., 2023). In Indonesia, the government has demonstrated an escalating commitment to accelerating national development by heavily prioritizing strategic public resource allocation through the mechanism of mandatory spending (Taher et al., 2020), including education, health, and other spending categories. However, despite the continuous increase in government spending, its effectiveness in improving HDI remains a major challenge. This condition indicates that higher budget allocations have not yet translated into significant improvements in human development quality. Issues related to inefficient budget realization and suboptimal policy implementation limit the impact of government spending (Saragih, 2022). Therefore, further research is required to provide clear empirical evidence regarding the impact of government spending on human development in Indonesia.

Alongside the strengthening of fiscal allocations, the government of Indonesia has placed a significant emphasis on reforming institutional governance by positioning risk management as a core pillar of the Integrated government internal control system (BPKP, 2021). Indonesian government moves away from fragmented practices so that this holistic framework (Firdauzi et al., 2024) that requires government entities to systematically identify, evaluate, and mitigate institutional and programmatic risks before escalating into failures. By institutionalizing risk management within this integrated internal control system framework, Indonesia seeks to ensure that public resources will optimize the achievement of development outcomes (Muhtar et al., 2024), including human development quality. Several studies in the area of risk management in public sector are mostly focused on financial management output such as performance (Winarna et al., 2021), compliance (Badara & Saidin, 2012), fraud (Hashim et al., 2020; Purnomo, 2017), and financial reporting quality (Nurlinda et al., 2020). However, there is a very limited study that has comprehensively examined the role of risk management in Indonesian public sector in shaping developmental outcomes that really represent public welfare, more importantly human development. This gap underlies the urgency of further studies. Moreover, it will also be interesting to evaluate the potential catalyst effect of risk management in strengthening the effect of government spending on human development.

Grounded in the sparse literature on public sector risk management and developmental outcomes, the novelty of this study is threefold. Firstly, it fills an empirical gap by evaluating the direct impact of risk management on human development quality with a comprehensive observation that covers all Indonesian local governments. Second, it investigates the

potential catalyst role of risk management in translating government spending into developmental outcomes, shifting the focus from fiscal volume to governance quality. Finally, it enriches the regional literature by capturing these dynamics across western and eastern Indonesia to account for spatial structural disparities. The study also produce policy recommendations in regards with local government spending and risk management in Indonesia in efforts to achieve human development. By understanding the nexus among government spending, risk management, and human development, this study is expected to bring a positive contribution as an effort to strengthen the role of local government to advance in human development in accordance with the spirit of local autonomy in Indonesia.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Agency Theory

This study is grounded in Agency Theory, which explains the relationship between principals (society) and agents (government) in managing public resources. According to Jensen & Meckling (1976), agents are expected to act in the best interests of principals by allocating resources efficiently and effectively (Muhtar, 2023). In the context of public finance, local governments are responsible for managing public funds to improve social welfare, including human development outcomes (Sutaryo et al., 2025). In addition, this study is supported by Public Expenditure Theory, which emphasizes that government spending should be allocated to maximize social welfare and economic efficiency (Colm, 1936). Government intervention through public spending is necessary to address market failures and ensure equitable access to essential services such as education and health, which are key components of human development (Eckstein, 1961). Human development itself is measured using the Human Development Index (HDI), which reflects achievements in health, education, and living standards (Lind, 2019). Therefore, government spending in sectors related to these dimensions is expected to play a significant role in improving HDI.

Human Development

The concept of human development is established by the UNDP back in 1990 (Lind, 2019). Sooner after its introduction, the human development concept becomes a great reference in the international level practiced by most countries throughout the world to measure the quality of people's life (Burchi & De Muro, 2016). Human development concept integrates various aspects to measure people's life quality such as higher lifespan, higher education level, higher income per capita, lower fertility rate, and lower inflation (Shah, 2016). The concept arises as it is believed that economic indicators alone cannot overcome social problems that the people are facing. Degree of freedom, human rights, and inequality are several examples that economic indicators and thus they cannot illustrate the whole picture of people's welfare (Acheampong et al., 2022; Stanton, 2007; Tusalem, 2022). In practice, there are three dimensions employed to measure human development: health, knowledge, and economic development (Filippidis & Katrakilidis, 2015).

Government Education Spending and Human Development Quality

Theoretical and empirical literature has recognized government spending on education as a supporting factor of human development quality. Grounded in the endogenous growth framework, government education spending is not merely a consumption cost, but a strategic investment in human capital accumulation (Almutairi, 2023). Substantial fiscal allocation through this channel enhances the structural quality of the educational system, establishing a robust foundation for sustainable economic and social development (Balaj & Lani, 2017). Empirically, Obi & Obi (2014) demonstrate a positive relationship between the expansion of government education

spending and the overall quality of educational outcomes. When this public funding successfully improves educational quality, it directly expands societal capabilities, fosters cognitive skills, and accelerates national welfare alongside sustainable development goals (Hanushek, 2020).

The realization of government education spending also works through equity-enhancing channels. As highlighted by Artige & Cavenaile (2023), government education spending plays a pivotal role in reducing socio-economic inequality. In the context of human development metrics, increased and well-targeted government education spending directly improves knowledge dimensions, such as literacy rates and school expectancy. Consequently, a higher fiscal allocation allows the state to provide better infrastructure, and equitable access, which collectively elevate the overall quality of human development. Based on these theoretical linkages and empirical insights, the first hypothesis is formulated as follows:

H1: Government education spending has a positive effect on human development quality

Government healthcare spending and human development quality

In addition to education, government healthcare spending represents another cornerstone of fiscal policy aimed at enhancing the quality of human development. Empirical evidence from Banik et al. (2023) and Ruzima & Veerachamy (2023) demonstrates that government healthcare spending exhibit positive effect on human development outcomes. This alignment is further supported by Miranda-Lescano et al. (2022) who emphasize that robust public financial allocation toward health services is essential for elevating HDI performance, more particularly within developing economies. In practice, the strategic allocation government spending within the healthcare sector plays an significant role in safeguarding and maximizing public health outcomes McIntyre et al. (2017). As argued by Edeme et al. (2017), healthcare indicators exhibit substantial improvements in direct response to an increased fiscal expansion allocated to the healthcare function, establishing a clear relationship between budgetary inputs and societal well-being.

As for the theoretical justification for this hypothesis, it can be drawn from the health-led growth hypothesis, which posits that investments in public health function directly as critical investments in human capital accumulation (Erdogan & Erdogan, 2023). A healthier population exhibits higher labor productivity, enhanced cognitive capacities, and longer life expectancy that will serve as foundational pillars for broader socioeconomic and overall economic development. Consequently, maintaining a sustained focus on government healthcare spending must remain a priority for local governments in attempts to achieve welfare goals (Behera & Dash, 2019). Based on these theoretical frameworks and empirical evidence, the second hypothesis is proposed:

H2: Government healthcare spending has a positive effect on human development quality

Government economic spending and human development quality

Government economic spending also plays an equally critical role in shaping the quality of human development. Fiscal allocations directed toward economic functions are linked to the enhancement of public welfare (Asongu & Nwachukwu, 2016; Sandjaja et al., 2020). A proper allocation of government economic spending enables local governments to adequately fund targeted poverty alleviation programs, thereby mitigating severe socioeconomic vulnerabilities. Empirically, the realization of this expenditure stimulates human development by directly supporting local economic activities and driving sustainable economic development (Dudzevičiūtė, 2023). This mechanism is further supported by Alwell (2020), who demonstrates that public spending aimed at reinforcing economic stability and security serves as a

vital catalyst for real economic growth.

A higher allocation of government economic spending expands the state's capacity to finance structural programs designed to accelerate productive local outputs. Specifically, these fiscal injections optimize outcomes in essential grass-roots economic dimensions, including structural support for Small and Medium Enterprises (SMEs) (Prasetyo, 2020; Rachmania et al., 2012), community empowerment initiatives (Badaruddin et al., 2021), and employment (Islam & Islam, 2021). By fostering a robust business ecosystem and expanding employment opportunities, government economic spending directly elevates household income levels. In the context of human development metrics, this economic empowerment serves as a vital transmission channel that reinforces the decent standard of living or welfare dimension of the human development. Based on these theoretical linkages and empirical insights, the third hypothesis is formulated as follows:

H3: Government economic spending has a positive effect on human development quality

Risk management and human development quality

In the public sector, organizational activities are inherently exposed to multi-dimensional risks that can open opportunities for deviant behaviors (Winarna et al., 2021) that may impede development. As local government systems expand, unrecognized institutional and programmatic risks often escalate, necessitating the urgent implementation of comprehensive risk management (Dabbagoglu, 2012) through systematic risk identification, evaluation, and mitigation (Muhtar et al., 2024). Risks associated with corruption and fraud threaten organizational accountability, damaging the public reputation of local governments and causing severe fiscal loss and program performance loss. Therefore, establishing proper risk management is critical to safeguard public resources and interests so that development aspiration can be achieved (COSO, 2013; Winarna et al., 2021). In practice, risk management can be combined with consistent monitoring that will effectively help mitigate program failures, prevents budgetary diversions, and enhances overall public performance and accountability (Hashim et al., 2020; Purnomo, 2017; Yasin et al., 2019). In the context of human development, a clean and risk-mitigated public sector ensures that fiscal resources for crucial sectors, such as education, healthcare, and economic empowerment, are fully and efficiently delivered to the grassroots without being corrupted or wasted, thereby driving the state's capacity to elevate the overall quality of human development.

H4: Risk management has a positive effect on human development quality

The moderating role of risk management in the relationship between government spending and human development quality

Risk management is hypothesized to play an important moderating role by strengthening the positive effect of government spending on the human development quality. While substantial fiscal allocation to crucial sectors such as education, healthcare, and economic development serves as the primary engine for human development efforts, the actual efficiency of these budgetary inputs heavily depends on the institutional governance environment. In an environment lacking robust risk frameworks, government spending is highly vulnerable to institutional bottlenecks, program execution failures, and corrupt behavior that impede the developmental impact. By integrating risk management into the fiscal execution cycle, local governments can systematically identify, evaluate, and mitigate execution risks, thereby preventing budgetary diversions and ensuring that public resources are delivered efficiently to the grassroots without being wasted. Finally, a strong risk management framework acts as a moderator strengthen the developmental effect of government spending by ensuring that every unit of government spending is optimally converted into tangible development outcomes. Therefore, we

propose the following hypothesis:

H5: Risk management strengthens the positive effect of government spending on human development quality

RESEARCH METHODS

Research Design

The study is a causality study that explores the impact of government education, health, and economic spending along with risk management on human development quality. The study predicts that government spending and risk management will improve human development. The observations of the study cover all 508 local governments (districts and cities) in Indonesia during 2021-2023 and the study uses secondary panel data obtained from the authorized institution such as the Ministry of Finance, Finance and Development Supervisory Agency (BPKP), Ministry of Home Affairs (Kemendagri), Central Statistics Agency (BPS), and the respective local governments.

Research Variables

The research variables consist of dependent, independent, moderating, and control variables. The dependent variable of the study is the local human development quality measured by Human

Table 1.
Research Variables Summary

Variable (Notation)	Operational Definition	Measurement
Dependent Variables		
Human development quality (HDI)	The quality of human development in a local government	Local Human Development Index (HDI) published by the BPS, measured by using the geometric mean of three dimensions: the life expectancy index, education index, and income index.
Independent Variables		
Government education spending (LN_EXP_EDU)	The realization of government spending for education function	Natural logarithm of government education spending, obtained from the Ministry of Finance
Government healthcare spending (LN_EXP_HEALTH)	The realization of government spending for healthcare function	Natural logarithm of government health spending, obtained from the Ministry of Finance
Government economic spending (LN_EXP_ECO)	The realization of government spending for economic function	Natural logarithm of government economic spending, obtained from the Ministry of Finance
Moderating Variables		
Risk management (MRI)	The quality of risk management implementation in a local government	Risk management Index, measured by using the arithmetic mean of the converted scores across the risk planning, capability, and result components based on BPKP regulation: 0: Absent; 1: Initial; 2: Developing; 3: Defined; 4: Managed; 5: Optimizing
Control Variables		
Internal audit capability (APIP)	The level of internal audit function capability in a local government	Internal audit capability Index assessed by BPKP
Local wealth (WEALTH)	The wealth of local government	Natural logarithm value of local government total assets
Local government type (LGTYPE)	The administrative status of a local government	Dummy variable: 1 for city, 0 for district

Development Index (HDI). The independent variables of the study consist of government education, health, and economic spending as measured by the natural logarithm of each expenditure. Meanwhile, the moderating variable is risk management. Risk management measurement evaluates three aspects: Planning to identify and prioritize organizational risks; Capability to ensure the readiness of leadership commitment, regulations, and HR competency; and Results to prove the effectiveness of mitigation actions in securing the achievement of institutional performance targets. We also employ various control variables that consist of internal audit apparatus capability, local wealth, and local government type. The details of the measurement is presented as Table 1.

Data Analysis

We conduct an initial analysis by examining the descriptive statistics of our research variables. After ensuring the potential multicollinearity using correlation analysis, the primary analysis is performed with panel data regression to examine the effect of government spending on human development quality, with the moderating effect of risk management. Our analysis also involves subsample analysis based on geographic region, by dividing the West (Sumatra, Java & Bali, and Borneo) and East (Sulawesi & Nusa Tenggara, Maluku, and Papua) region, following the disparity between those regions as mentioned by pervious studies (Nugraha & Prayitno, 2020). The regression equation is presented as follows:

Baseline Effect:

$$HDI = a + ß_1LN_EXP_EDU + ß_2LN_EXP_HEALTH + ß_3LN_EXP_ECO + ß_4MRI + ß_5APIP + ß_6WEALTH + ß_7LGTYPE + e \quad (1)$$

Moderating Effect:

$$HDI = a + ß_1LN_EXP_EDU + ß_2LN_EXP_HEALTH + ß_3LN_EXP_ECO + ß_4MRI + ß_5LN_EXP_EDU*MRI + ß_6LN_EXP_HEALTH*MRI + ß_7LN_EXP_ECO*MRI + ß_8APIP + ß_9WEALTH + ß_{10}LGTYPE + e \quad (2)$$

ANALYSIS AND DISCUSSION

Descriptive Statistics

Descriptive statistics analysis aims to provide an initial overview of the data distribution for the variables used in the study. We use a set of unbalanced panel data due to incomplete data issue in several observations. Table 2 reports the descriptive statistics of the variables utilized in this study, capturing a total of 1,524 observations across district and city local governments in Indonesia. The quality of human development as proxied by the Human Development Index, demonstrates a mean score of 72.481. According to the United Nations Development Programme (UNDP) classification, this average positions the sampled regions within the high human development category. In addition, the data exhibits a wide disparity, ranging from a minimum score of 36.51 to a maximum achievement of 89.1. Despite having been categorized into high level, it

Table 2.
Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
HDI	1524	72.481	6.079	36.51	89.1
LN_EXP_EDU	1524	26.57	0.666	24.558	28.686
LN_EXP_EDU (in IDR)	1524	346.13 B	221.85 B	46.28 B	2.86 T
LN_EXP_HEALTH	1523	26.232	0.608	24.423	28.459
LN_EXP_HEALTH (in IDR)	1523	246.84 B	165.40 B	40.51 B	2.29 T
LN_EXP_ECO	1523	26.015	0.702	22.856	29.955
LN_EXP_ECO (in IDR)	1523	200.20 B	385.12 B	12.58 B	10.22 T
MRI	1512	1.967	0.573	0	3
APIP	1524	2.536	0.58	1	3
WEALTH	1457	28.801	0.696	25.019	31.61
LGTYPE	1524	0.183	0.387	0	1

Notes: B = billion rupiahs; T = trillion rupiahs.

is still at early stage as the next level (very high) is still far to achieve with standard value of minimum 80.

Regarding government spending, the variables are presented in their natural logarithm forms to ensure distributional symmetry, with their actual monetary values calculated via exponential transformation. Government education spending (LN_EXP_EDU) records an average value of 26.57 (equivalent to an actual spending of approximately IDR 346.13 billion), with the lowest allocation at 24.558 (approx. IDR 46.28 billion) and the peak allocation reaching 28.686 (approx. IDR 2.86 trillion). Meanwhile, government healthcare spending (LN_EXP_HEALTH) shows a mean value of 26.232 (approx. IDR 246.84 billion), fluctuating between a minimum of 24.423 (approx. 40.51 billion rupiahs) and a maximum of 28.459 (approx. IDR 2.29 trillion). For government economic spending (LN_EXP_ECO), the sampled regions allocate an average of 26.015 (approx. IDR 200.20 billion). Lastly, the risk management shows an average score of 1.967. This mean value indicates that the local governments' risk management maturity on average still sits at Level 1 (Initial stage). This reflects an evolving progression toward Level 2 (Developing) that has been very close to reach. In our research observations, the risk management index metric ranges from a minimum score of 0, representing a complete absence of formalized risk management policy and frameworks at Level 0 (Absent), to a maximum score of 3, which signifies a well-established and structured risk management implementation at Level 3 (Managed).

To complement the statistical overview, a spatial descriptive analysis is performed to visualize the geographical distribution of human development quality across Indonesian local governments. As illustrated in Figure 2, the spatial mapping reveals a persistent and pronounced west-east spatial disparity in HDI achievements. The western and central regions of Indonesia, particularly Java, parts of Sumatra, and coastal Kalimantan, are heavily dominated by green clusters signifying "High" human development, alongside localized blue spots indicating "Very High" achievements. In contrast, a significant developmental lag is visible as the observation shifts toward Eastern Indonesia, particularly within the Papua region. This territory is visibly characterized by a dense concentration of yellow patches representing "Medium" status and red patches indicating "Low" human development quality. This spatial pattern confirms that despite nationwide development efforts, Eastern Indonesia remains substantially left behind, highlighting the urgent need for more targeted and equitable regional fiscal interventions.

Correlation

Following the descriptive statistics, a correlation analysis is executed to ensure that the empirical model is clear of serious multicollinearity issues. The diagnostic results reveal that the correlation coefficients among all independent

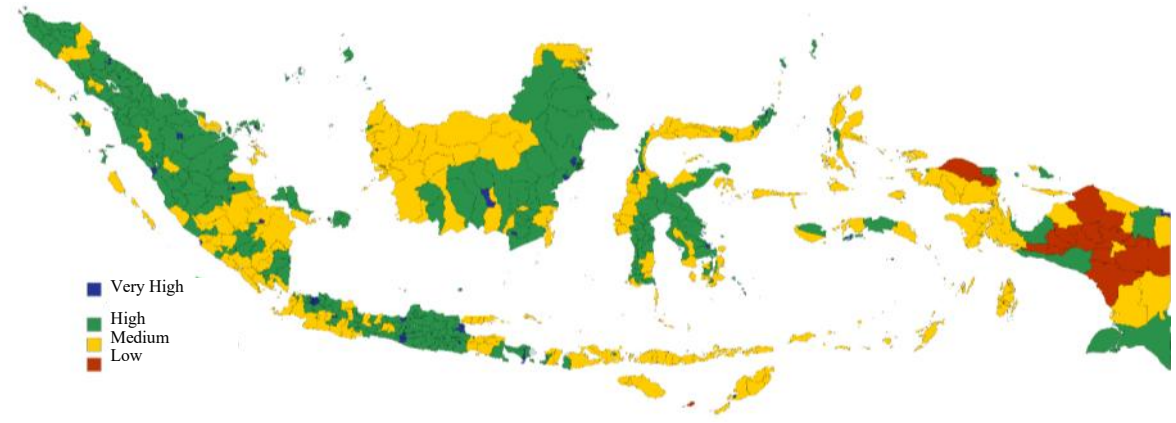


Figure 1.
Human Development Quality Distribution Map in Indonesia

variables remain well within acceptable thresholds, indicating that the model is entirely free from severe multicollinearity. Consequently, the explanatory variables demonstrate sufficient independent variance, confirming that the dataset is highly robust and fully eligible for further panel data regression analysis.

Panel Data Regression

We perform panel data regression analysis to eaxmine the empirical evidence of the explanatory variables' effect on human development quality. Our statistical tests for the main model conclusively identified the random effects model as the most efficient and accurate estimator for this study as the reported Hausman chi-square statistics is at 65.54 with probability value of 0.076. In addition, there are several timely-invariant variables within our model that consist of risk management, internal audit capability, and local government wealth so that the use of fixed effect will not be efficient (Wooldridge, 2013). Thus, the approach can be used as the foundational framework for interpreting the empirical findings presented as follows:

Table 4 reports the result of our baseline effect analysis formulated with model (1). Firstly, government education spending exhibits a positive effect on the quality of human development across all scenario, both for all observations and West-East region subsamples. Government healthcare spending, however, is evidenced to be a non-significant determinant in all scenario. In contrast, government economic spending shows a robust positive effect on

Table 3.
Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) HDI	1.000							
(2) LN_EXP_EDU	0.351	1.000						
(3) LN_EXP_HEALTH	0.350	0.667	1.000					
(4) LN_EXP_ECO	0.209	0.588	0.570	1.000				
(5) MRI	0.384	0.291	0.278	0.277	1.000			
(6) APIP	0.449	0.318	0.315	0.163	0.407	1.000		
(7) WEALTH	0.381	0.689	0.709	0.667	0.285	0.263	1.000	
(8) LGTYPE	0.584	-0.071	0.030	-0.038	0.149	0.192	0.176	1.000

Table 4.
Panel Data Regression Result for Model (1) – Baseline Effect

Variables	All Obs	West Indonesia	East Indonesia
LN_EXP_EDU	0.946***	0.286*	1.092***
	(0.122)	(0.172)	(0.185)
LN_EXP_HEALTH	-0.0602	0.0522	-0.102
	(0.108)	(0.133)	(0.187)
LN_EXP_ECO	0.318***	0.296***	0.363***
	(0.0388)	(0.0442)	(0.0738)
MRI	0.555***	0.520***	0.599***
	(0.0387)	(0.0428)	(0.0779)
APIP	0.245***	0.319***	0.104
	(0.0459)	(0.0509)	(0.0913)
WEALTH	0.731***	0.789***	0.622***
	(0.0617)	(0.0650)	(0.136)
LGTYPE	8.911***	7.327***	11.48***
	(0.472)	(0.376)	(1.226)
Constant	16.27***	31.04***	13.68**
	(3.308)	(3.969)	(5.918)
Observations	1,444	953	491
Number of local governments	508	332	176
R-squared overall	0.4826	0.5801	0.3828

*Notes beside reported coefficient: * p<0.1; ** p<0.05; *** p<0.01 Standard error in parentheses.*

human development quality across all scenario. Finally, risk management proves to be another strong determinant, showing a consistent positive impact across all models.

Table 5 reports the results of empirical testing regarding the moderating role of the risk management. We find conclusive empirical evidence that the risk management does not moderate the effect of government education spending, government healthcare spending, or government economic spending on human development quality. The insignificance of moderating effect is consistent across all scenarios, including all observations, West Indonesia subsamples, and East Indonesia subsamples.

Table 6 reports the results of further test by using lagged explanatory variables to account for delayed effects. Using one-year observation lag, we report that the main results remain overall consistent, with one key exception in which risk management now significantly strengthens the impact of economic expenditures on human development, revealing that risk management plays role in securing the long term development program outcomes.

Discussion

Government education spending and human development quality

Our analysis reveals a positive impact of government education spending on human development that confirms our hypothesis. This result provides empirical weight to the argument that fiscal distribution toward education functions as a strategic investment in human capital accumulation rather than a mere consumption cost (Almutairi, 2023). Expanding educational budget enables local governments to upgrade the structural quality of the educational ecosystem, thereby establishing a robust foundation for long-term socioeconomic development (Balaj & Lani, 2017). This expansion effectively translates into improved educational outcomes, which directly enhance societal capabilities and upgrade essential skills (Hanushek, 2020; Obi & Obi, 2014).

Table 5.
Panel Data Regression Result for Model (2) – Moderating Effect

Variables	All Obs	West Indonesia	East Indonesia
LN_EXP_EDU	1.285***	0.461	1.442***
	(0.229)	(0.312)	(0.413)
LN_EXP_HEALTH	-0.0523	0.0359	0.0482
	(0.235)	(0.293)	(0.411)
LN_EXP_ECO	0.456***	0.480***	0.501**
	(0.110)	(0.124)	(0.220)
MRI	6.120***	4.522***	9.207**
	(1.597)	(1.684)	(4.375)
LN_EXP_EDU*MRI	-0.166	-0.0850	-0.189
	(0.105)	(0.126)	(0.216)
LN_EXP_HEALTH*MRI	0.0216	0.0167	-0.0659
	(0.115)	(0.131)	(0.225)
LN_EXP_ECO*MRI	-0.0660	-0.0835	-0.0763
	(0.0506)	(0.0536)	(0.115)
APIP	0.266***	0.325***	0.130
	(0.0476)	(0.0508)	(0.0949)
WEALTH	0.732***	0.794***	0.614***
	(0.0639)	(0.0650)	(0.141)
LGTYPE	8.896***	7.334***	11.46***
	(0.445)	(0.376)	(1.174)
Constant	3.414	21.83***	-2.735
	(4.697)	(5.514)	(9.871)
Observations	1,444	953	491
Number of local governments	508	332	176
R-squared overall	0.4911	0.5809	0.3903

Notes beside reported coefficient: * p<0.1; ** p<0.05; *** p<0.01; Standard error in parentheses.

Furthermore, the notably larger coefficient observed in East Indonesia underscores the equity-enhancing channel of such fiscal interventions, where targeted spending lowers barriers to access for historically less-developed regions, ultimately accelerating the knowledge dimension of the HDI (Artige & Cavenaile, 2023). In the Indonesian policy context, this positive mechanism is driven by the constitutional mandate requiring local governments to allocate at least 20% of their local budgets to the education function. Through national strategic interventions such as the School Operational Assistance (BOS) fund and local smart cards (e.g., Kartu Jakarta Pintar or similar local educational subsidies), fiscal expansions directly expand physical access to primary and secondary schooling. In Eastern Indonesia, where baseline educational infrastructure historically lags behind Java, targeted education transfers and special autonomy funds act as a vital equalizing tool, significantly narrowing cross-regional human capital disparities.

Government healthcare spending and human development quality

We further evidence that government healthcare spending exhibit an insignificant effect on human development quality across all scenarios. This insignificant effect suggests that an incremental increase in healthcare budget allocations does not automatically translate into improvements in public health quality. Thus, it does not significantly support overall human development achievement. This sub-optimal outcome may arise due to the inefficiencies in the allocation, execution, and utilization of healthcare budgets that restrict the effectiveness of public spending in upgrading actual healthcare delivery (Banik et al., 2023). Additionally, the existing disparities in healthcare accessibility, geographical variations in medical facility quality, and weak bureaucratic enforcement dilute the potential impact of government healthcare

Table 6.
Additional Test using Lagged Explanatory Variables

Variables	Model (1) All Obs	Model (2) All Obs
L1.LN_EXP_EDU	0.555***	0.963***
	(0.160)	(0.260)
L1.LN_EXP_HEALTH	-0.129	0.0445
	(0.114)	(0.261)
L1.LN_EXP_ECO	0.374***	0.149
	(0.0420)	(0.114)
L1.MRI	0.448***	4.120**
	(0.0419)	(1.794)
L1.LN_EXP_EDU*MRI		-0.180
		(0.115)
L1.LN_EXP_HEALTH*MRI		-0.0839
		(0.126)
L1.LN_EXP_ECO*MRI		0.128**
		(0.0566)
L1.APIP	-0.0701	-0.0450
	(0.0527)	(0.0548)
L1.WEALTH	0.476***	0.463***
	(0.130)	(0.133)
L1.LGTYPE	9.027***	9.022***
	(0.507)	(0.493)
Constant	35.78***	26.55***
	(5.165)	(6.205)
Observations	949	949
Number of local governments	506	506
R-squared overall	0.4356	0.4487

Notes beside reported coefficient: * p<0.1; ** p<0.05; *** p<0.01
Standard error in parentheses.

spending. This insignificant finding strongly underlies that the volume of fiscal injection alone is insufficient. It should be followed by institutional governance quality in directing how effectively public healthcare funds are operationalized to reach grassroots communities (Apriska et al., 2024; Arifin & Murjani, 2017). Our finding reflects the operational bottlenecks within Indonesia's decentralized healthcare system. Despite the mandatory spending rule, a substantial portion of regional healthcare budgets is absorbed by administrative operational overheads and curative care subsidies, particularly under the National Health Insurance (BPJS Kesehatan) scheme. This fiscal distortion leaves insufficient funds for preventive, promotive, and primary health infrastructure such as Community Health Centers (Puskesmas) in remote archipelagic regions. Furthermore, structural challenges in doctor distribution and procurement delays for medical supplies prevent budget expansion from directly improving health indicators like infant mortality or life expectancy.

Government economic spending and human development quality

Our analysis confirms that government economic spending demonstrates a positive impact on human development quality in both aggregate and regional subsamples. This empirical finding validates that public resources allocated to economic functions are useful to help elevate public welfare (Sandjaja et al., 2020) and social security (Abbott & Jones, 2012). Adequate fiscal distribution to economic function facilitates the execution of local development programs, which drive sustainable economic growth and stimulate local productivity (Alwell, 2020; Dudzevičiūtė, 2023). From a transmission perspective, government economic spending may provide the financial backbone needed to support SMEs (Prasetyo, 2020; Rachmania et al., 2012), advance community empowerment (Badaruddin et al., 2021), and increase employment opportunities (Islam & Islam, 2021). By supporting local business ecosystems and securing household incomes, government economic spending successfully reinforce the decent standard of living dimension and therefore help elevate the overall human development quality. From a policy perspective, this result highlights the effectiveness of local government economic programs under national mandates such as the Job Creation Law and local infrastructure acceleration initiatives. Local budget allocations for economic functions directly fund connectivity roads, rural markets, agricultural subsidies, and empowerment grants for MSMEs. By stimulating local labor markets and reducing cost, these targeted economic investments immediately increase household real purchasing power, directly elevating the spending dimension of the local human development quality.

Risk management, human development quality, and Its Moderating Role on Government Spending Effect

We finally reveal that risk management exhibits no significant moderating role in the relationship between government spending and human development quality. The finding is consistent across all scenarios both for aggregate dataset and West-East Indonesia subsamples. This finding implies that while risk management directly improves human development and institutional accountability that confirming the COSO (2013) concept and the positive impact on public sector performance and accountability (Hashim et al., 2020; Purnomo, 2017; Yasin et al., 2019), it has not functioned as an active catalyst to strengthen the realization of government spending. Due to sub-optimal bureaucratic quality in Indonesian local government, risk management is often treated as a separate administrative compliance requirement rather than being comprehensively integrated into the strategic planning and targeting phases of education, healthcare, and economic expenditures. This insignificant finding may also arise because risk management index achievement across local governments in Indonesia overall sits at an

early and developing stage. Thus, the implementation may heavily focus on post-audit financial compliance and internal accounting fraud prevention rather than actively optimizing the value-for-money or programmatic efficiency of public spending. Finally, it has not yet reached the required level to strategically amplify the moderating role.

Discussion for Additional Test

Our final test using lagged explanatory approach reveals that risk management strengthen the positive effect of economic spending on human development quality. The finding implies that risk management is important in securing the long term development program outcomes. It basically aligns with the nature of economic projects such as infrastructure and local business support that require time to mature before yielding noticeable welfare benefits. During this period, effective risk management plays a crucial role in preventing delays and budget leakages, ensuring economic spending effectively translates into improved public welfare.

One important result to also note is regarding the control variables, in which the effect of local government type is very strong. Cities normally possess major structural advantages over districts in Indonesia in terms of development as they naturally benefit from higher population density, better basic infrastructure, and advanced facilities, making public services like education and healthcare much easier to access (Saragih, 2022). As a result, city local governments start from a significantly higher baseline of human development, allowing them to translate public administration efforts into welfare outcomes far more effectively than geographically dispersed districts.

CONCLUSION AND IMPLICATION

This study aims to examine the impact of local government spending and risk management on human development quality along with the potential moderating role of risk management. We reveal a pronounced west-east developmental gap, where western regions are heavily dominated by high human development clusters, whereas Eastern Indonesia suffers from lower index achievements. The panel data regression analysis further demonstrates that government education and economic expenditures, alongside risk management, positively affect human development quality. Meanwhile, government healthcare spending exhibit no significant developmental impact across all regional specifications. Moreover, we also provide conclusive evidence that risk management exhibits no significant moderating role, implying that the risk framework currently only operates as a bureaucratic requirement that focuses on administrative compliance rather than development catalyst. Based on our findings, it is highly recommended that government should emphasize the value-for-money implementation of government spending, not merely focused on volume-based fiscal allocations within the mandatory spending regulation. More specifically, local governments should pay more attention on the fiscal interventions within the lagging east Indonesia region to effectively bridge the spatial disparity. Additionally, local governments must urgently elevate their risk management maturity by deeply integrating risk mitigation frameworks into the strategic planning and execution step in public finance. Finally, the circumstances can fully maximize the role of risk management to act as a catalyst on government spending to help support sustainable human development.

LIMITATIONS AND SUGGESTIONS

This study is subject to several limitations that offer valuable avenues for future studies. Firstly, the research period is restricted to a relatively short three-year timeframe (2021–2023) that may not fully capture the long-term development. Secondly, the analysis relies solely on quantitative analysis without incorporating qualitative nuances. The measurement of government spending based on spending amount also may not fully reflect spending quality. Future studies should address

these limitations by extending the research period and by adopting a mixed-methods approach that combines quantitative and qualitative approaches.

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