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A path analysis on the effect of human development index, financial performance, and macroeconomic factors on local government financial accountability and transparency in Indonesia

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ABSTRACT

The research investigates the direct and indirect relationships among the Human Development Index (HDI), Regional Original Revenue (PAD), General Allocation Fund (DAU), inflation, Gross Regional Domestic Product (GRDP), and local government accountability, with transparency as an intermediary variable. Based on institutional theory, stakeholder theory, and agency theory, it presents an original integrative conceptual approach on how socioeconomic and fiscal variables interact with financial affairs and governance within the Indonesian fiscal system. A quantitative explanatory research approach and path analysis were conducted based on a sampled secondary data source gathered from 33 Indonesian provinces from 2014 to 2024. The results show that HDI and DAU significantly improve local government accountability variables directly and indirectly via transparency. Moreover, PAD contributes significantly to transparency but not accountability. By contrast, inflation and GRDP have no significant effects on transparency but have slightly considerable direct effects on accountability. The results confirm transparency's very significant and direct effects on accountability, emphasizing transparency and openness within financial statements. It shows fiscal transfers and developments are most effectively made and on accountability mediated and facilitated by transparency. It develops an original integrative theoretical structure among institutional theory, stakeholder theory, and agency theory, illustrating fiscal and developmental forces and factors, and strengthening and maintaining transparency and accountability within the Indonesian fiscal system.

Contribution/Originality: This research presents empirical evidence indicating that advancements in human development and the optimization of fiscal transfers contribute to enhanced accountability, particularly when facilitated by transparent governance. The findings guide policymakers in strengthening public-finance transparency frameworks and designing evidence-based interventions to improve local government performance within Indonesia's decentralized fiscal system.

1. INTRODUCTION

The realization of *good governance* in public organizations management is a major goal in a country's development; hence, the process of public accountability is very necessary. This process determines the success of the government in delivering information to the public in a correct and responsible manner. Accountability is crucial in every activity, where the output of government management is community accountability as the highest holder of sovereignty. The main characteristic of *good governance* is the creation of transparency and accountability in public budget management (Wardini, 2008). Therefore, government plays a critical role in realizing public accountability and transparency by providing legislator education, public committees, and other interested parties.

Despite this constant reform, progress remains quite low regarding government performance accountability in countries like Indonesia. Specifically, at the district/city level, accountability on development indicators was only 63.74%; at the provincial level, 61.57%; and at the national or ministries/agencies levels, only 59.31% (Secretary General of the House of Representatives, 2019). Based on these, one might generally infer that more often than not, more of these leaders lack dedication towards improvement and actually have little promotion of a culture towards implementing these reforms within their respective bureaucracies and agencies, as many public services never actually trickle down to, at most, a scale below local or grassroots and end up facing obstacles such as corruption, collusions, and nepotism that prevent progress toward transparency and accountability. Transparency International's Corruption Perception Scores reveal that, as of its 2023 Corruption Perception Index, Indonesia ranked only 115th.

The fact that anomalies and irregularities continue to persist within local government entities indicates that public accountability is still formalistic and lacks substance. In effect, accountability has to be truthful, transparent, and focused on governance output quality. Also, a transparency system has to be institutionalized to enhance accountability. By definition, public accountability is a "*sufficient condition*," whereas transparency and participation are "*necessary conditions*," because accountability can be made attainable only through well-managed transparency and participation at the national and local governance levels.

Applying good governance practices within public institutions is an act of accountability, influencing and controlling administrative actions and behavior to be responsive to external authorities and societal demands (Jamaluddin, 2017). Thus, eliminating all irregularities like corruption, markup, and abuse of public funds is a necessary accountability aim toward achieving good governance (Auditya, Husaini, & Lismawati, 2013).

The implementation of *good governance* principles by public or private institutions and sectors is a form of public accountability responsible for directing and supervising administrative behavior in providing responses to external authorities regarding anticipated performance (Jamaluddin, 2017). Therefore, the government is obliged to eradicate various irregularities in public management, such as acts of corruption and *mark-ups*, as an accountability goal to create good governance (Auditya et al., 2013).

Through this research, this study aspires to enhance understanding of accountability and its relationship to transparency, especially within Indonesia's decentralized fiscal system. This research seeks to improve clarity and accuracy in these concepts.

- Determine or identify the direct impact of the Human Development Index (HDI), Regional Original Revenue (PAD), General Allocation Fund (DAU), inflation, and Gross Regional Domestic Product (GRDP) on the financial accountability of local governments.
- Examine the indirect effects of these variables on accountability via mediating effects of transparency.
- Integrate institutional, agency, and stakeholder perspectives into a conceptual framework that explains how development, fiscal, and macroeconomic considerations interact and shape local financial governance in Indonesia.

2. LITERATURE REVIEW

2.1. Institutional Theory

The primary theoretical framework employed in this study is institutional theory. The theory has developed over several decades, originating from sociology and management studies, and encompasses the analysis of institutionalized forms and isomorphism in organizations, highlighting shared cognitive, normative, and regulative frameworks (Glynn & D'Aunno, 2023). This theory focuses on how organizations form and operate under the pressure of an institutional environment that causes institutionalization. Organizations are shaped by the surrounding institutional environment, which gives rise to ideas that are then institutionalized and considered legitimate and accepted as the organization's way of thinking through the legitimization process (Bag, Dhamija, Bryde, & Singh, 2022).

Scott and Meyer (1983) identify institutions, organizations, and actors as the components of institutional theory. Institutions provide the rules that organizations must follow in carrying out their activities and in their involvement in competition. Institutions also shape the conduct and perspectives of individuals within the organization. The institutional theory used to explain the role of informal institutions in the development of circularity and SP (Boffa, Prencipe, Papa, Corsi, & Sorrentino, 2023). Furthermore, Marrucci, Daddi, and Iraldo (2023) combined the stakeholder and institutional theory to investigate how external and internal pressure affects the performance of an organization and the adoption of green human resource management practices. However, individuals can also influence institutions by transforming existing institutions into new forms. Thus, institutions provide a choice of actions that serve as constraints on decision-making.

Institutional theory elucidates that organizations emphasizing legitimacy often endeavor to align themselves with external or societal expectations. Refer to Ridha and Basuki (2012), this theory provides a compelling rationale for both individual and organizational behaviors, positing that for an organization to endure, it must effectively persuade the public of its legitimacy and merit for support

2.2. Stakeholder Theory

Freeman (1984) is known as the person who came up with stakeholder theory. His 1984 book Strategic Management: A Stakeholder Approach was the first to use the idea. The theory has since expanded to include ideas from ethics, strategic management, corporate social responsibility, and organization theory. Stakeholder theory, as Freeman (1984), explains that individuals, groups, communities, or societies, both individually and collectively, with relationships and interests in public organizations, must be considered. This theory asserts that companies are not merely self-serving entities; they are required to provide benefits to their stakeholders as well.

The word "stakeholder" is used frequently across various fields, including business management, communication science, and natural resource management. Stakeholder theory emphasizes that businesses should consider and meet the needs of all stakeholders, both internal and external, rather than focusing solely on profits. It highlights the importance of managing relationships with groups such as investors, employees, customers, suppliers, and governments to balance different interests and achieve optimal results for the organization (Bridoux & Stoelhorst, 2022). In public organizations, the term stakeholder is often used during decision-making processes. *Stakeholders* can be categorized into primary stakeholders, who have a direct interest, and supporting *stakeholders* (secondary), who are concerned with policies and decisions made.

2.3. Agency Theory

Agency theory elucidates the relationship between two main parties: principals and agents. When principals delegate authority to agents, a mandate is given to perform actions on their behalf (Eisenhardt, 1989). Jensen and Meckling (1976) state that in this context, agents are required to provide relevant information to users of financial information, who serve as principals in evaluating accountability and making decisions. Matinheikki, Kauppi, Brandon–Jones, and van Raaij (2022) present a thorough study of agency theory applications in supply chain management, elucidating governance systems that alleviate principal-agent conflicts across diverse relationship types.

Agency theory can be utilized in the public sector to elucidate the execution of budgetary papers concerning public accountability and transparency. In this context, the relationship between the principle (citizens) and the agent (government) establishes an obligation for the government to account for the resources entrusted to it for management. The study by MAS (Al-Faryan, 2024) reexamines the separation of ownership and control through the lens of agency theory, corporate governance, and corruption, providing insights into the manifestation and management of agency conflicts within contemporary governance structures.

2.4. Human Development Index (HDI)

The Human Development Index (HDI) is a tool for measuring and comparing the level of human development across several aspects, including but not limited to education, health, and standards of living. HDI is measured on three core aspects: life expectancy, level of education, and purchasing power. Having a good level of human development is reflected in people's rising standards of living. HDI is also a comparative tool among nations. According to UNDP, HDI was created as an alternative and more comprehensive measurement and interpretation of people's status beyond economic growth.

As evidenced by empirical research, progress within HDI is reflected by better infrastructure, better access to education, better healthcare standards, and more opportunities within the economy. Thus, studies within Indonesia and Saudi Arabia have shown that an increase in years of educational attainment and life expectancy leads to an increase in HDI, and that health and education lie at the roots of development within humanity (Syam, 2025).

HDI is linked with economic growth and poverty reduction, but also faces challenges regarding environmental sustainability and health equity. Researchers highlight the need for an implementation strategy that addresses equity and measures beyond income. HDI remains an influential tool in human development measurement and analysis. Ongoing methodological improvements and criticisms aim for more detailed approaches in measurement and analysis (Mondal, Mookherjee, & Pattanayek, 2024).

2.5. Financial Performance

There exist many articles about various methods and approaches being adopted to assess the financial position and viability of a business. Various reviews have shown that almost all methods for financial position and performance measurement are quantified and based on analyses of ratios such as liquidity, profitability, solvency, and activity. These ratios show how well a company can make money, manage its assets, and meet its obligations (Dauerer, 2025).

Government financial performance can be measured through financial statements, including balance sheets, budget realization reports, and cash flow reports (Purba, 2025). Financial performance measurement is carried out by comparing the actualization of income and expenses within the allocated budget. Good financial performance promotes accountability and openness in public financial management. According to Mahsun (2009), financial performance measurement can be done by calculating the efficiency of expenditure revenue and the effectiveness of revenue.

Public accountability is understood as the obligation of the trust holder to provide accountability for government financial performance and activities. The main indicator of accountability is the presentation of relevant, reliable, and transparent financial reports. Several studies indicate that government performance accountability is positively influenced by good financial performance.

2.6. Macroeconomics

Macroeconomics studies the economy as a whole, including fiscal and monetary policies that affect economic growth. Inflation and Gross Regional Domestic Product (GRDP) are key measures of a region's economic situation. According to Thamrin (2018), fiscal and monetary policies are government measures to change the structure and amount of taxes aimed at influencing economic activity.

Changes in economic stability, such as economic growth and inflation, significantly impact government accountability. Several studies indicate that inflation and economic growth influence local financial management.

The availability of government financial performance disclosures and activity information is crucial for ensuring accountability.

2.7. Empirical Review

In the realm of good governance, transparency measures can enhance governmental administration and influence effectiveness, efficiency, and accountability. Previous research found that the relationship between population, social, and economic variables and transparency is strong, but not many have prioritized the accountability of public organizations based on the Institutional Theory approach. This study seeks to analyze the variables driving government performance and organizational accountability and explore them qualitatively. Based on the theoretical review and empirical findings regarding the HDI influence, financial performance, and macroeconomic variables on accountability, and the role of transparency as an intervening variable in local government financial management, this study hypothesizes:

H_1: Human Development Index has a positive effect on accountability.

H_2: Financial Performance has a significant effect on accountability.

H_3: Macroeconomics has a positive effect on accountability.

H_4: Human Development Index has a significant effect on accountability through transparency.

H_5: Financial performance has a significant effect on accountability through transparency.

H_6: Macroeconomics has a significant effect on accountability through transparency.

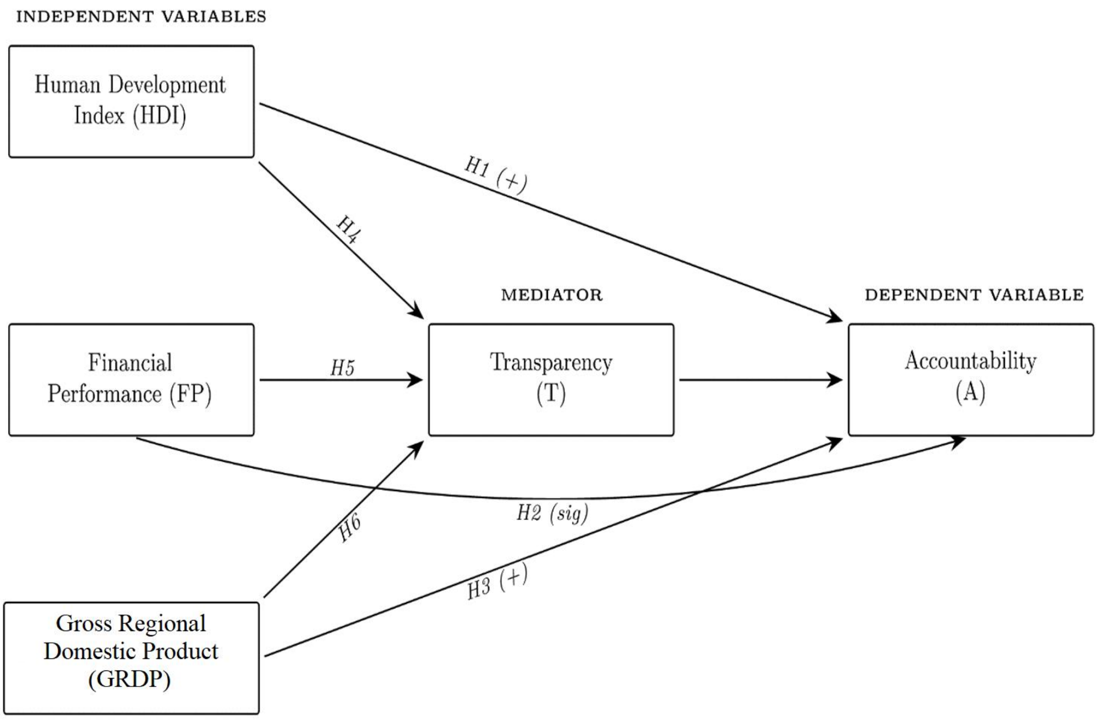

Figure 1. Conceptual framework.

This Figure 1 presents a conceptual research framework examining the determinants of accountability (A). Human Development Index (HDI), Financial Performance (FP), and Gross Regional Domestic Product (GRDP) are specified as independent variables. Transparency (T) functions as a mediating variable linking these determinants to accountability. The model proposes both direct effects of HDI, FP, and GRDP on accountability (H1–H3) and indirect effects through transparency (H4–H6), highlighting transparency's role in strengthening the relationship between development, economic performance, and accountability outcomes.

3. RESEARCH METHODOLOGY

3.1. Design, Population, and Sample

This study employs an explanatory design with a quantitative approach to analyze the effects of the Human Development Index, Regional Original Revenue, General Allocation Fund, Inflation, and Gross Regional Domestic Product on accountability, with transparency as an intervening variable. The population includes 33 local governments in Indonesia with complete data from 2014 to 2024. Purposive sampling was used to select 30 local governments as the sample.

3.2. Variable Description and Model Specifications

- Human Development Index (HDI): A measure that includes health, education, and living standards. Estimated to have a positive effect on accountability.
- Regional Original Revenue (PAD): Revenue from legal sources such as taxes. Expected to affect transparency and accountability.
- General Allocation Fund (DAU): Funds from the central government to support government functions. Expected to affect accountability, either directly or indirectly, through transparency.
- Inflation: The increasing rate of prices for goods and services. Expected to affect accountability directly and through transparency.
- Gross Regional Domestic Product (GRDP): The aggregate value of goods and services generated within a region. It is anticipated to enhance accountability.
- Transparency: The extent to which financial information is accessible to the public. Serves as an intervening variable.

In testing the effect of these accountability variables, this study used the model as follows:

3.2.1. Direct Influence Model

Description:

- $Y1$= Accountability.
- $X1$= Human Development Index.
- $X2$= Regional Original Revenue.
- $X3$= General Allocation Fund.
- $X4$= Inflation.
- $X5$= Gross Regional Domestic Product.
- $\alpha 0$= Constant.
- $\epsilon 1$= Error term.

3.2.2. Indirect Effects

Mediation effects were assessed using standardized path coefficients with bootstrapped standard errors (5,000 resamples), as recommended for SEM-based mediation analysis.

Description:

- $Y2$= Transparency.
- $\beta 0$= Constant.
- $\mu 1$= Error term.

3.2.3. Simultaneous Function Model

Description:

- $Y2$= Accountability.

- $Y1$= Transparency.
- $X1$= Human Development Index.
- $X2$= Regional Original Revenue.
- $X3$= General Allocation Fund.
- $X4$= Inflation.
- $X5$= Gross Regional Domestic Product.

3.2.4. Accountability Model through Transparency

Description:

- $\beta 0$= Constant for accountability model.
- $\mu 1$= Error term for accountability models.

3.3. Analysis Method

Data analysis was conducted using IBM SPSS Statistics 26.0 for descriptive and preliminary analyses, and AMOS 26.0 for path analysis and model fit testing to ensure reproducibility of the structural relationships. Secondary data was obtained from local government financial reports and other official sources. The analysis was conducted with statistical software to ensure the accuracy and validity of the results.

4. RESULTS AND DISCUSSION

The population of this study includes all provincial local government areas in Indonesia, such as Jakarta, Java Island, Sumatra, Sulawesi, Kalimantan, Maluku, Bali, and Papua from 2014 to 2024. During this period, the number of provincial local governments expanded, reaching 34 provinces by 2024. The research sample was selected using purposive sampling, focusing on local governments with official websites and a reputation for transparency in Indonesia's Open Budget. The final sample comprised 33 provinces over a 10-year period, totaling 330 observations.

Table 1. Descriptive Statistical Analysis.

Variables	N	Descriptive statistics			Standard deviation statistic
		Minimum statistic	Maximum statistic	Mean statistic	
Human development index (X_1)	330	57.19	80.76	68.131	3.922
Original regional revenue (X_2)	330	0.02	36.541	5.087	62.991
General allocation fund (X_3)	330	0.06	68.66	26.369	16.184
Inflation (X_4)	330	0.05	11.58	4.685	2.456
Gross regional domestic product (X_5)	330	5.94	87.37	28.841	14.091
Transparency (Y_1)	330	0.63	0.88	0.764	0.061
Accountability(Y_2)	330	27.00	98.33	87.129	12.956

Source: Data processed (2024).

The Table 1 presents the descriptive statistics for all variables used in the analysis based on 330 observations. The Human Development Index (X1) shows moderate variation across regions, indicating differences in social development levels. Fiscal variables Original Regional Revenue (X2) and the General Allocation Fund (X3) exhibit wide ranges and relatively high standard deviations, reflecting substantial disparities in regional fiscal capacity. Inflation (X4) remains relatively stable, with a moderate mean and limited dispersion. Gross Regional Domestic Product (X5) displays notable variation, suggesting heterogeneity in regional economic scale. The dependent variables, Transparency (Y1) and Accountability (Y2), show relatively high mean values, indicating generally strong governance performance, although accountability demonstrates greater variability compared to transparency.

4.1. Descriptive Statistical Analysis

Descriptive statistical analysis shows inter-regional variation in terms of Human Development Index (HDI), Regional Original Revenue (PAD), General Allocation Fund (DAU), inflation, and Gross Regional Domestic Product (GRDP) over the 2014-2024 period. The average HDI shows a positive trend, with a consistent increase each year.

Table 2. Multicollinearity assumption testing results.

Structure equation		Collinearity statistics	
Dependent variable	**Independent variable**	**Tolerance**	**VIF**
Transparency (Y_1)	Human development index (X_1)	0.626	1.599
	Original regional revenue (X_2)	0.899	1.112
	General allocation fund (X_3)	0.650	1.539
	Inflation (X_4)	0.943	1.061
	Gross regional domestic product (X_5)	0.964	1.037
Accountability (Y_2)	Human development index (X_1)	0.500	1.794
	Original regional revenue (X_2)	0.889	3.414
	General allocation fund (X_3)	0.623	1.204
	Inflation (X_4)	0.938	1.209
	Gross regional domestic product (X_5)	0.964	2.672
	Transparency (Y_1)	0.602	1.659

Source: Data processed (2024).

Table 2 reports the collinearity diagnostics for the structural equation model using tolerance and Variance Inflation Factor (VIF) values. All tolerance values exceed the commonly accepted threshold of 0.10, and all Variance Inflation Factor (VIF) values are below the stricter threshold of 5.00. These results indicate that there is no serious multicollinearity among the independent variables. Therefore, the Human Development Index, fiscal variables, inflation, and Gross Regional Domestic Product can be jointly included in the regression model without causing instability in the parameter estimates. In addition, Transparency can be reliably included as an explanatory variable in predicting Accountability.

4.2. Multicollinearity Assumption Testing

Multicollinearity testing assesses the correlation among independent variables within a regression model. The test results indicate that all independent variables possess a tolerance value exceeding 0.10 and a VIF below 10, thereby confirming the absence of multicollinearity among the variables.

Table 3. Model fit assessment results.

Model fit index	Cut-off value	Analysis result	Evaluation model
Chi-square	Small Value Expected	0.323	Good
Probability	> 0.05	0.570	Good
CMIN/DF	< 2	0.323	Good
RMSEA	< 0.08	0.000	Good
TLI	> 0.95	1.030	Good
NFI	> 0.90	0.999	Good

Source: Data processed (2024).

This Table 3 presents the goodness-of-fit evaluation indicates that the proposed model fits the data well. The Chi-square value is relatively small (0.323) with a probability value of 0.570, which is greater than 0.05, indicating that the model is consistent with the observed data. In addition, other fit indices also meet the recommended thresholds, including CMIN/DF (0.323 < 2.00), RMSEA (0.000 < 0.08), TLI (1.030 > 0.95), and NFI (0.999 > 0.90).

These results demonstrate that the structural model exhibits a good level of fit and is appropriate for further hypothesis testing.

4.3. Model Fit Assessment (Goodness-of-Fit)

Model fit assessment is carried out to measure the suitability between observation data and predictions from the model that has been made. The model approval results show that the model has a good fit size.

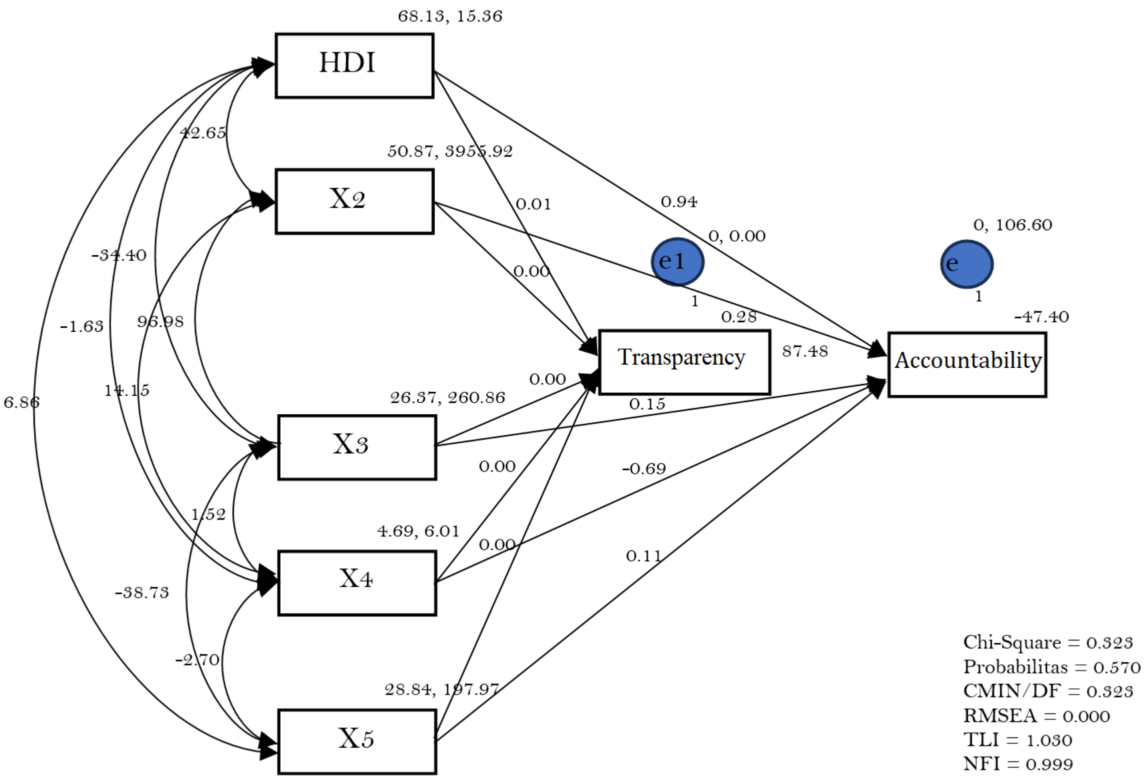

Figure 2. Structural equation model of the relationships among regional development and fiscal variables, transparency, and accountability.

The Figure 2 illustrates the estimated structural equation model examining the relationships among regional development and fiscal variables, transparency, and accountability. Human Development Index (HDI), Original Regional Revenue (X_2), General Allocation Fund (X_3), Inflation (X_4), and Gross Regional Domestic Product (X_5) are specified as exogenous variables influencing transparency, which in turn affects accountability. Direct effects from the exogenous variables to accountability are also included. The standardized path coefficients and error terms are reported for each relationship, and the model demonstrates an excellent overall fit, as indicated by the goodness-of-fit indices shown in the figure.

4.4. Causality Test with Path Analysis

Hypothesis testing is conducted by regression models in path analysis to forecast the relationship between independent and dependent variables. The results of path analysis show that the Human Development Index, Regional Original Revenue, General Allocation Fund, Inflation, and Gross Regional Domestic Product affect Transparency and Accountability.

4.5. Direct, Indirect, and Total Influence

Table 4 reports the structural model results, which show that the Human Development Index, Original Regional Revenue, and General Allocation Fund have significant effects on Transparency. Inflation and Gross Regional Domestic Product do not significantly influence Transparency. Furthermore, the Human Development Index and

Transparency have significant positive effects on Accountability. These findings indicate that improvements in human development and transparent governance practices contribute to higher levels of public sector accountability. Overall, the findings highlight transparency's central mediating role in linking development and fiscal capacity to accountability outcomes.

Table 4. Standardized path coefficient.

Variable Relation	Estimate	S.E.	p-value	Result
HDI → Transparency	0.012	0.003	<0.001	Significant
PAD → Transparency	0.004	0.002	0.006	Significant
DAU → Transparency	-0.006	0.001	<0.001	Significant
Inflation → Transparency	-0.002	0.004	0.412	Not significant
GRDP → Transparency	0.003	0.005	0.238	Not significant
HDI → Accountability	0.410	0.210	<0.001	Significant
Transparency → Accountability	0.360	0.043	<0.001	Significant

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; NS = Not significant.

Table 5. Standardized direct, indirect, and total effects**.

Path	Direct effect (β)	Indirect effect (β)	Total effect (β)	Significance
HDI → Accountability	0.415	0.148	0.564	***
PAD → Accountability	0.072	0.007	0.079	ns
DAU → Accountability	0.267	-0.039	0.228	**
Inflation → Accountability	-0.153	-0.001	-0.154	**
GRDP → Accountability	0.192	0.004	0.196	**
Transparency → Accountability	0.362	—	0.362	***

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$; ns = not significant.

Table 5 shows that the Human Development Index has both direct and indirect effects on Accountability through Transparency, suggesting partial mediation. The General Allocation Fund, Inflation, and Gross Regional Domestic Product also show significant direct effects on Accountability, although their indirect effects through Transparency are relatively small. Meanwhile, Original Regional Revenue does not significantly affect Accountability either directly or indirectly. Transparency itself has a significant positive effect on Accountability, confirming its mediating role in the model.

- All coefficients are standardized (β)
- Indirect effects calculated as:

β (X → Transparency) × β (Transparency → Accountability)

Path analysis is used to test direct and indirect relationships between variables. The results of hypothesis testing can be summarized as follows:

- HDI→ Transparency→ Accountability

HDI has a significant effect on transparency ($p = 0.000$) and accountability both directly ($\beta = 0.415$) and indirectly through transparency ($\beta = 0.148$). This finding supports institutional theory that the legitimacy of public organizations is obtained through fulfilling social expectations, including improving people's quality of life.

- PAD→ Transparency→ Accountability

PAD has a significant effect on transparency ($p = 0.010$), but not on accountability ($p = 0.36$). This suggests that local revenue tends to influence information disclosure more than the accountability system itself.

- DAU→ Transparency→ Accountability

DAU has a significant effect on accountability ($p = 0.002$), but not on transparency ($p = 0.274$). This indicates that central funds are more directly used to support accountability mechanisms than to improve public information disclosure.

- Inflation→ Transparency→ Accountability

Inflation has no significant effect on transparency (*p = 0.521*) and no significant effect on accountability indirectly, but has a direct effect on accountability (*p = 0.039*). This is in line with macroeconomic theory that price stability has an impact on the quality of public management, although it does not affect data disclosure.

- GRDP→ Transparency→ Accountability

GRDP has no significant effect on transparency (*p = 0.344*) nor indirectly on accountability, but has a direct effect on accountability (*p = 0.045*).

- Transparency→ Accountability

Transparency has a strong and positive standardized effect on accountability (β = 0.362, p < 0.01), indicating that improvements in information disclosure substantially enhance fiscal accountability.

4.6. Hypothesis Testing

Hypothesis testing is done by looking at the p-value. The test results show that:

a. *H_{1a}: Human Development Index (X1) → Transparency (Y1) is accepted.*
b. *H_{1b}: Human Development Index (X1) → Accountability (Y2) is accepted.*
c. *H_{2a}: Local Revenue (PAD) (X2) → Transparency (Y1) is accepted.*
d. *H_{2b}: Local Revenue (PAD) (X2) → Accountability (Y2) is rejected.*
e. *H_{3a}: General Allocation Fund (DAU) (X3) → Transparency (Y1) is accepted.*
f. *H_{3b}: General Allocation Fund (X3) → Accountability (Y2) is accepted.*
g. *H_{4a}: Inflation (X4) → Transparency (Y1) is rejected.*
h. *H_{4b}: Inflation (X4) → Accountability (Y2) is accepted.*
i. *H_{5a}: Gross Regional Domestic Product (X5) → Transparency (Y1) is rejected.*
j. *H_{5b}: Gross Regional Domestic Product (X5) → Accountability (Y2) accepted.*
k. *H_{6}: Transparency (Y1) → Accountability (Y2) is accepted.*

Table 6 shows the results of the bootstrapping method to obtain indirect effects to test the mediating role of Transparency in the relationship between the independent variables and Accountability. The findings show that only the indirect effect of Human Development Index (HDI) on Accountability through Transparency is statistically significant (β = 0.148, p = 0.001), thus confirming the mediating role. Conversely, the indirect effects of PAD, DAU, Inflation, and GRDP on Accountability through Transparency are not statistically significant because their p-values are large. This implies that Transparency is a significant mediator only in the relationship between HDI and Accountability. It appears that fiscal and macroeconomic variables have direct effects on accountability.

Table 6. Bootstrapped standardized indirect effects**.

Indirect Path	Standardized indirect effect (β)	Bootstrapped SE	p-value	Mediation
HDI → Transparency → Accountability	0.148	0.041	0.001	Significant
PAD → Transparency → Accountability	0.007	0.019	0.711	Not significant
DAU → Transparency → Accountability	-0.039	0.028	0.164	Not significant
Inflation → Transparency → Accountability	-0.001	0.017	0.921	Not significant
GRDP → Transparency → Accountability	0.004	0.021	0.842	Not significant

- All coefficients are standardized (β).
- Significance tested using 5,000 bootstrap resamples.

Table 6 shows that the bootstrapping analysis was conducted to examine the mediating role of Transparency in the relationship between the independent variables and Accountability. The results indicate that Transparency significantly mediates the relationship between the Human Development Index and Accountability ($\beta = 0.148$, $p = 0.001$). However, the indirect effects of Original Regional Revenue, General Allocation Fund, Inflation, and Gross Regional Domestic Product through Transparency are not statistically significant. These findings suggest that Transparency only serves as a significant mediating variable in the relationship between the Human Development Index and Accountability.

4.7. The Effect of Human Development Index on Transparency

The results showed that the Human Development Index has a positive and significant effect on transparency. The higher the Human Development Index, the higher the level of financial transparency of local governments. Some previous research supports this finding, which shows that when the quality of people's lives improves, transparency in financial management increases.

4.8. The Effect of Local Revenue on Transparency

Transparency is significantly positively affected by Regional Original Revenue. These results show that the transparency of regional financial management is higher when the PAD revenue is greater. This aligns with the theory that regional financial independence can increase accountability and transparency.

4.9. The Effect of the General Allocation Fund on Transparency

The finding revealed that there was a negatively significant impact of the General Allocation Fund on transparency. The higher the revenue at DAU, the lower the level of transparency. The result indicated that if local governments relied on government transfers for financial support, it would affect transparency.

4.10. The Effect of Inflation on Transparency

It can be seen that inflation does not have a significant impact on transparency. The result suggests that, even though inflation may affect people's buying power, it does not have a direct relationship with transparency in financial matters within local governments.

4.11. The Effect of Gross Regional Domestic Product on Transparency

Gross Regional Domestic Product has an insignificant positive effect on transparency. This indicates that economic growth increases transparency, but it is not a strong enough predictor to be considered significant.

4.12. The Effect of Human Development Index on Accountability

The Human Development Index positively and significantly affects accountability. As HDI strengthens, so does financial accountability within local administrations. These results clearly show that better lives for people lead to improved accountability in financial administration.

4.13. The Effect of Local Revenue on Accountability

Local revenue appears to have a negative but insignificant impact on accountability. Although an increase in own-source revenue was expected to positively influence accountability, it does not have a significant effect, as shown by the analysis.

4.14. The Effect of General Allocation Fund on Accountability

General Allocation Fund has a positive and significant impact on accountability. The higher the revenue realized by DAU, the higher the financial accountability exercised by local governments. The finding confirms that central government allocation of funds influences accountability in regional fund management.

4.15. The Effect of Inflation on Accountability

A negative and significant result occurs with inflation. As the rate of inflation increases, the accountability level offered by local government declines. The result implies that inflation affects proper financial management and damages government credibility.

4.16. The Effect of Gross Regional Domestic Product on Accountability

Gross Regional Domestic Product (GRDP) positively and significantly influences accountability. The more GRDP, the more financial accountability local governments have. This result indicates that good economic growth enhances local government capabilities to control and account for finances.

4.17. The Effect of Transparency on Accountability

Transparency has a positively significant effect on accountability. The results showed that the higher the level of transparency, the higher the financial accountability of local governments. This indicates that information disclosure and transparent financial management can increase public trust in government.

4.18. Effect of Human Development Index on Accountability through Transparency

The finding shows that the Human Development Index significantly affects accountability mediated by transparency. This means that increasing HDI not only directly increases accountability but also through increased transparency. This finding highlights the importance of the quality of people's lives in encouraging government accountability.

4.19. The Effect of Local Revenue on Accountability through Transparency

Local owned revenue did not show a significant effect on accountability through transparency. Although there is an expectation that an increase in PAD will increase accountability through transparency, the results show that the effect is not significant.

4.20. The Effect of the General Allocation Fund on Accountability through Transparency

The General Allocation Fund significantly affects transparency and accountability. Although DAU has a negative effect on transparency, it still contributes to accountability when transparency is considered as a mediating variable.

4.21. The Effect of Inflation on Accountability through Transparency

Inflation does not show a significant effect on accountability through transparency. Although inflation can affect accountability directly, its effect through transparency is not significant.

4.22. The Effect of Gross Regional Domestic Product on Accountability through Transparency

Gross Regional Domestic Product has no significant effect through transparency on accountability. This suggests that although GRDP has a positive effect on accountability, its influence through transparency is not strong enough to be a significant predictor.

4.23. Discussion

The finding indicates that indicators of social and macroeconomic influence diversely affect local government accountability and transparency. Panel data from 33 provinces across Indonesia during 2014-2024 was used via *path analysis* to reveal the direct and indirect relationships between the research variables as follows.

1. The Effect of HDI on Transparency and Accountability

The interpretation of the path coefficients highlights the role of HDI and transparency as factors contributing to accountability. There is a large effect size with $\beta = 0.41$, $p < 0.01$ for HDI → Accountability, emphasizing human development's significant role in enhancing local government capabilities.

In practical terms, a one-standard-deviation increase in HDI corresponds to nearly a half-standard-deviation increase in accountability scores, indicating that socially advanced provinces exhibit stronger fiscal discipline and responsiveness. Similarly, the Transparency → Accountability path ($\beta = 0.36$, $p < 0.01$) demonstrates a medium-to-large practical effect: each incremental improvement in information disclosure and public access to financial data yields meaningful gains in perceived and measured accountability.

This finding is highly consistent with *Institutional Theory* (Scott & Meyer, 1983), which states that public organizations, including local governments, tend to behave according to the expectations of the social environment in order to gain legitimacy. In this case, people with a higher HDI - who are more educated, healthy, and have strong purchasing power - are a source of social pressure on the government to be more transparent and accountable. Previous studies, such as Martani, Suarjana, and Isnawati (2014), show that regions with high HDI are better prepared to implement *e-budgeting* and *e-audit* systems. Guillamón, Bastida, and Benito (2011) and Serrano-Cinca, Cuadrado-Ballesteros, and García-Benau (2009) also concluded that social indicators such as education and health contribute to increased demand for transparency and public participation in fiscal oversight. According to Stakeholder Theory, a society with a high standard of living not only receives government policies but is also a vital stakeholder in monitoring the budget implementation. Therefore, enhancing HDI not only contributes to societal developments but acts as a catalyst within an accountable financial sector.

2. The Effect of PAD on Transparency and Accountability

The result shows that PAD outcomes have a major influence on transparency ($\beta = 0.191$; $p = 0.010$), but not on accountability ($\beta = 0.072$; $p = 0.315$), either directly or indirectly. It could be seen that boosting fiscal autonomy as a result of PAD does not solely enable comprehensive accountability. In Stakeholder Theory (Freeman, 1984), local governments should be more responsive to public needs if they have their own revenue sources. But in reality, as found in this study, PAD is still mostly used for routine expenditures such as employee salaries, not for improving public services or budget transparency. According to Agency Theory, PAD gives agents (local governments) more authority in managing budgets without direct supervision from the central government. However, without pressure from the public (horizontal principals), there is no strong incentive for agents to act accountably. Guillamón et al. (2011) and Kurniawati (2010) found that PAD has no impact on the quality of accountability if it is not accompanied by strengthening internal control systems and public participation. Therefore, although PAD reflects fiscal independence, it has not functioned effectively as a driver of substantive transparency or social accountability.

3. Effect of General Allocation Fund (DAU) on Transparency and Accountability

The results of this study show that DAU has a significant positive effect on accountability ($\beta = 0.267$; $p = 0.002$), but a negative and insignificant effect on transparency ($\beta = -0.107$; $p = 0.274$), with the total effect on accountability remaining positive, although the indirect path through transparency is negative (-0.039).

This indicates that the accountability created by the General Allocation Fund (DAU) is vertical, i.e., to the central government, not to the community. *Agency theory* explains that in this relationship, the central government acts as the principal, establishing a technocratic reporting mechanism through an audit and performance reporting system. Therefore, while administrative accountability has increased, transparency to the public has not improved significantly. Navarro-Galera, Alcaraz-Quiles, and Ortiz-Rodríguez (2015) emphasize that fiscal incentives that do not link the allocation of funds to public transparency indicators tend to strengthen internal control, not public participation. This is also reinforced by Lukito (2017), who shows that high DAU does not always impact fiscal information disclosure in the regions. In *Stakeholder Theory*, the failure of DAU to increase transparency is due to the absence of direct attachment between the community as the main *stakeholder* and the use of these funds. Local governments focus more on administrative compliance with the center rather than building accountable relationships with local communities.

The negative sign of DAU → Transparency requires theoretical interpretation. Under Agency Theory, the General Allocation Fund (DAU) strengthens vertical accountability toward the central government but does not incentivize horizontal transparency toward citizens. Transfer-dependent local governments often focus on administrative compliance with central audits rather than voluntary information disclosure. This finding is consistent with Stakeholder Theory, which argues that as fiscal interdependence substitutes for direct citizen taxation, government transparency becomes less society-driven. It follows that this finding implies there should be performance indicators based on transparency within formulas designed for transfers.

4. The Effect of Inflation on Transparency and Accountability

The result shows that inflation does not have a significant relationship with transparency ($p = 0.521$), but it has a negative relationship with accountability (-0.153; $p = 0.039$). That means inflation could weaken the fiscal accountability system, but does not impact information disclosure. According to Agency Theory, inflation leads to fiscal uncertainty and information asymmetry. It becomes difficult for the government as an agent to achieve consistency between budgetary planning and implementation. It affects reporting and makes it difficult for people to assess local fiscal performance. According to Navarro-Galera et al. (2015) and Caamaño-Alegre, Lago-Peñas, Reyes-Santias, and Santiago-Boubeta (2013), a stable macroeconomic environment is a basic necessity for a reliable reporting system. Moreover, as per Institutional Theory, inflation affects the establishment of norms and transparency and accountability policies and makes it necessary for governments to be reactive and technocratic as they lose connections with society. That means inflation acts as an institutional barrier and affects fiscal accountability at the local government level.

The Negative relationship between Inflation and Accountability ($\beta = -0.15$, $p < 0.05$) also implies some theoretical and practical considerations. From an Agency Theory basis, inflation increases budget risk and thus reduces the credibility with which agents (local government authorities) can fulfill budget obligations. From an Institutional Theory focus, persistent inflation implies a deterioration in institutional norms and standards of prudence and planning.

5. Effect of GRDP on Transparency and Accountability

As shown in the results, GRDP has a significant effect on accountability ($\beta = 0.192$; $p = 0.045$), but not significant on transparency ($p = 0.344$). This indicates that economic growth has not automatically impacted public information disclosure. In *Stakeholder Theory*, local governments with high economic capacity should be better able and obliged to meet the expectations of public and business transparency. But in reality, as shown by the thesis and study of Navarro-Galera et al. (2015), regions with high gross regional domestic product (GRDP), such as East Kalimantan and Riau, still have low transparency indices. *Agency theory* explains that an increase in fiscal capacity due to gross regional domestic product (GRDP) growth strengthens agents' technical capabilities, but does not reduce information asymmetry if it is not accompanied by social pressure or institutional incentives. Caamaño-Alegre et al. (2013) also show that the relationship between economic power and transparency is highly dependent on the quality of local governance and the level of public participation. In other words, economic growth only strengthens formal accountability, while transparency still requires political will and institutional reform.

6. Transparency to Accountability

The results show that transparency has a positive and significant effect on accountability ($\beta = 0.362$; $p = 0.001$), being one of the main determinants in the model. It clearly establishes that information disclosure is a necessary condition for effective public accountability. According to Agency Theory, information disclosure enhances transparency and narrows down information asymmetry within the agency (the government) and principal (the people). At the same time, Institutional Theory regards transparency as a value within modern politics pressured from outside. Several research studies, including Caba-Perez, Rodriguez-Bolivar, and Lopez-Hernandez (2014); Fadillah (2012), and Munoz and Bolivar (2017), suggest that budgetary transparency enhances involvement and confidence. However, administrative transparency alone would not meet these standards. To fix these problems, transparency needs to be combined with making information easy to find and share.

7. The Role of Transparency as a Mediating Variable

Findings on the path model illustrate that transparency significantly functions as a mediating variable for HDI and accountability, with an indirect value of 0.103 and p-value < 0.05. Conversely, for variables like PAD, DAU, inflation rates, and GRDP, there were no significant mediations on transparency with p-value > 0.1. It implies a more direct relationship with accountability. Again, it strengthens the role and stance of Institutional Theory, which illustrates that a society with a better quality of life, signified by better HDI, demands transparency and leads local governments to improve their accountability reporting. Those provinces with high HDI values, like DKI Jakarta, Yogyakarta, and Bali, display better transparency and accountability. However, the failure of transparency to mediate economic variables such as PAD and GRDP suggests that transparency in many regions is still procedural, emphasizing compliance with formal regulations rather than a commitment to public control. Guillamón et al. (2011) and Hermana, Silfianti, and Sena (2012) also highlight that information digitization has not been fully used to strengthen public participation or improve budget oversight. Thus, the mediating role of transparency will only be effective if it is supported by an open organizational culture, adequate institutional capacity, and active community involvement, especially in regions with high-quality human development.

8. General Finding

Nevertheless, this finding of this study shows that local government accountability is influenced by social, fiscal, macroeconomic factors, and the level of transparency of public information. The results of the path model confirm that the Human Development Index (HDI) has the strongest and most consistent influence on accountability, both directly and through transparency. PAD has an effect on transparency but not significantly on accountability, indicating that fiscal independence has not automatically increased public accountability. DAU has a positive impact on accountability through reporting mechanisms to the center but does not strengthen transparency to the public. Inflation decreases accountability, indicating that macroeconomic instability hampers the effectiveness of budget governance. GRDP increases accountability but does not significantly affect transparency, signaling that economic growth has not been in line with public information disclosure. Transparency itself is shown to have a significant effect on accountability and to be an effective mediator only in the relationship between HDI and accountability, not on other economic and fiscal variables. These findings reinforce that human development and public information systems are key to accountable local governance. For fiscal decentralization plans to lead to real good governance, they need to be backed up by changes to institutions, making fiscal information available online, and making it easier for the public to take part in public scrutiny.

5. CONCLUSION

This research determined that HDI, PAD, and DAU have a large effect on regional financial openness, but there is no effect created by inflation and GRDP. HDI, DAU, inflation, and GRDP have a significant impact on accountability, but there is no impact created by PAD. The transparency variable turned out to be a significant mediating variable, and it plays an important role within the relationship created among HDI and accountability. However, there isn't a significant effect created by transparency regarding the mediating role among PAD, DAU, inflation, and GRDP.

6. IMPLICATION AND POLICY RECOMMENDATION

The implications of findings made within this research carry great importance for developing fiscal governance frameworks for Indonesia. It becomes clear that there are very complex interactions among various factors related to developmental, fiscal, and macroeconomic factors, which play an increasingly dynamic role within the establishment of fiscal transparency and accountability at local government levels. There needs to be an establishment of a process for fiscal transparency, which would be achieved through changes at a technical as well as an institutional level. It would have to be done together by all parties: central government, provinces, and municipalities.

Firstly, it can be noted that fiscal transfer programs such as the General Allocation Fund (DAU) not only have to be used for purposes related to equity but should actually be used for purposes related to enhancing transparency. The DAU can be used for implementing performance-related allocation programs. Such programs would ensure that funds are allocated only if a satisfactory performance standard related to transparency is met by local governments. This can be done by implementing performance-related criteria for DAU.

Second, improving fiscal transparency largely depends on having adequate information and communication technology infrastructure. Implementing a nationally integrated e-budgeting and reporting system would enable all levels of government to record, process, and disclose fiscal information systematically. This would require minimal human processing, resulting in fewer discrepancies and generating real-time data that is easily accessible. Digital fiscal transparency not only enhances efficiency but is also essential for discouraging discretionary processing of fiscal information.

Thirdly, it is clear that HDI has a strongly positive effect on holding governments accountable. This highlights the importance of human capital investment. Training for financial officials, internal auditors, and data analysts is necessary for improving the authenticity and timeliness of fiscal reporting. Capacity-building activities can be conducted not only on officials but also on civic organizations and media groups to strengthen the demand side for transparency. This will enable better interpretation and use of information made public.

Fourth, public engagement activities must be formalized in local fiscal governance. Transparency can only be truly functional if citizens have the right and opportunity to interact with it. Thus, public engagement sessions, citizen audits, and public spending discussions must be made mandatory through local legislation and national policy. They can improve horizontal accountability and increase citizen confidence in government performance.

Finally, macroeconomic stability is necessary for a country to retain fiscal responsibility. This is because inflation can affect not only fiscal reporting but also fiscal performance. If fiscal policies, which involve monetary policies focusing on maintaining economic stability, are implemented, these policies would allow governments to have clear reporting strategies regardless of economic environments. Conclusion: Indonesia's fiscal transparency can thus be improved by a combination of institutional incentives, technological innovation, capacity-building, public participation, and macroeconomic discipline. These measures can help translate transparency from a process aim to a substantive element of effective governance to embed fiscal accountability as a permanent reality even in Indonesia's fiscal federalism.

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