QUALITY OF SPENDING AND HUMAN DEVELOPMENT: DOES ACCOUNTABILITY MATTER?

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Abstrak
Based on an equivalent level of expenditure, some districts achieve a high Human Development Index (HDI) while others lag behind. This indicates that other factors influence the achievement of a high HDI. This paper examines the link between public spending, governance, and human development. The role of governance is measured by the level of accountability. Empirical studies are conducted using district-level panel data in Indonesia. The results in this paper suggest that public expenditure alone is insufficient for achieving a good human development outcome. However, when governance is involved, public expenditure in the health sector becomes effective in increasing HDI in districts with high local government accountability, and vice versa is not effective in districts with low accountability. Therefore, local government accountability needs to be strengthened to improve the quality of human development.
Kata Kunci: Human Development, Public Expenditure, Accountability, Local Government, Quality of Spending

INTRODUCTION

Following two decades of fiscal decentralization, the role of local governments has now expanded to include human development programs. With mandatory spending in the education and health sectors, there should not be too much variation in these expenditures. However, in terms of achieving a high Human Development Index (HDI), large gaps remain between various districts. In 2023, the lowest district HDI score was 37.68 and the highest was 88.61 [1]. The large gaps and the unevenness of the achievements among these districts therefore need to be understood in order to accelerate the improvement of national human development. Further analysis is needed to ascertain why certain districts achieve a high HDI while others manage only a low HDI.

Figure 1.1 shows that with the same level of expenditure in the education or health sector, some districts achieve good HDI scores while others lag behind. Although districts have allocated education spending at the level of

20%, or health spending at the level of 10%, there remains a relatively sizable variation or heterogeneity in terms of HDI achievement. This demonstrates that additional factors contribute to HDI.
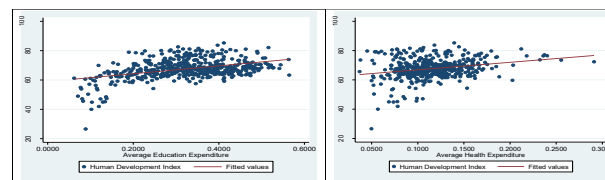

Figure 1.1. Differences in the average expenditures in education and health on the achievement of HDI

In terms of quantity, regional spending in Indonesia is increasing in line with economic development and the increasing transfers from central government to the regions. In 2016, central transfers to the regions reached Rp 710 trillion, while in 2023 central transfers to the regions reached Rp 881 trillion [2].

However, the Minister of Finance also stated that the increase in the quantity of spending was not accompanied by a corresponding increase in the quality of spending and thus many problems remain, including inadequate education and health facilities. The quality of spending is related to the issues of efficiency, execution, and governance [3]. The focus of budgeting continues to prioritize the absorption of budget or the quantity of spending as opposed to its quality.

The role of government in human development remains a topic of debate. Several studies have stated that the government plays a positive and significant role in human development [4-8], while others have shown insignificant or even negative results [9-11]. These studies measure the role of government in the form of public expenditure on HDI as aggregate welfare [5,7-10] or on the dimensions of HDI [4,6,11].

The low or insignificant impact of public expenditure can be explained in two ways. First, there is a substitution of public expenditure and private expenditure wherein the public sector "crowds out" the private sector, as described in a study conducted by Atukeren [12] in developing countries. The second reason is institutional inefficiencies such as weak governance that have an effect on spending effectiveness [13-17].

The majority of previous studies related to the role of governance on human development have been cross-country studies carried out using the World Governance Indicator published by the World Bank [10,13-16]. However, studies linking governance and human development at the district level in developing countries remain very rare. This might be due to the limited amount of data captured by governance indicators. Bhanumurthy, Prasad, and Jain [17] examined the influence of governance in India but only in a limited scope and did not control for many of the things that affected human development.

Although many studies have discussed public expenditure and human development, studies on the role of governance at the district level in Indonesia are still very limited. Most studies on human development continue to focus on the allocation of government spending [5,11,18,19]. As such, they have not taken into account governance as an important factor in the same way as other studies, which means they contain omitted variable bias.

Governance can be examined from various perspectives. However, according to the World Bank [20], the central aspect of governance lies in accountability. The United Nations Development Programme (UNDP), in its report, also explicitly states that Indonesia must give serious attention to local accountability mechanisms [21]. This raises a question regarding the role of local government accountability on human development.

This study will link HDI and accountability using three accountability measurements of local governments in Indonesia. Broadly, the results of the study indicate that the quantity of public expenditure alone is insufficient to bring changes to the desired conditions. Governance, or accountability, plays an important role in any public policy intervention.

LITERATURE REVIEW
1. Human Development, Quality of Spending, and Accountability

Human development is a comprehensive concept that places humans at the center of all aspects of the development process. It constitutes an effort to overcome the limitations of the economic growth approach without ignoring income as a measure of welfare. UNDP [22] states that human development is the ultimate goal of development, while economic growth is the principal means by which to achieve that goal. UNDP has created a composite index that is expected to reflect human development indicators, namely the

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HDI. The HDI measures the achievement of a country based on three basic dimensions of human development: a long and healthy life, access to knowledge, and a decent standard of living.

In calculating the HDI, there have been changes in the methods used by UNDP since 2010. The main difference lies in the aggregation method used, with a shift from the use of an arithmetic mean to the current use of a geometric mean. These changes reflect the limitations of the arithmetic mean; that is, a low achievement on one dimension can be masked by high achievements on the other dimensions. The geometric mean addresses this and thus the achievement of one dimension cannot be concealed by the achievements of other dimensions. In other words, the three dimensions receive equivalent attention because they are equally important.

Musgrave and Musgrave [23] stated that not all economic problems can be solved through market mechanisms, especially those related to social goods. This is due to the characteristic of the market as somewhere to seek individual profits, with the effect that economic activities that are public and social in nature cannot be conducted through the market, including those related to human development programs.

To overcome this market failure, government intervention is needed in the form of various functions such as the allocation function for the provision of social and public goods; thus, it is the government that carries out the expenditure. However, Rosen and Gayer [24] argued that such government intervention can lead to "crowding out" when government provision replaces or substitutes provision from the private sector.

The quality of spending concept derives from the theory of government spending in the economy and is currently developing in many dimensions. Most empirical studies remain focused on the composition of spending that affects the outcomes [25-26]. However, the quality of spending is defined by Busatto [25] as a mix between budget composition and appropriate public policy where public policy is related to the way in which spending is carried out in an effective manner. Therefore, the quality of spending is also influenced by the role of governance in delivering these expenditures to the public effectively and efficiently.

The World Bank [20] stated that "accountability is at the heart of good governance, and has to do with holding governments responsible for their action." In line with this, Shah [27] asserted that good governance can be established through the strengthening of accountability. The occurrence of corruption, as an indication of poor governance, is thus an impact of weak accountability. According to Peters [28], the term accountability can be interpreted in various ways. The simplest form of accountability relates to the administration of what the organization has done and takes the form of reporting to the legislature, external examinations, and the public as a means of ensuring that the success or failure of a program is communicated.

To ensure local government accountability, various regulations have been developed that oblige local governments to regularly submit reports on their accountability. These obligations include financial accountability in the form of Local Government Financial Reports, performance accountability in the form of Government Agency Performance Accountability Reports, and local administration accountability through the Local Government Implementation Report.

The evaluation of financial accountability is regulated in Law Number 15 of 2004 using government accounting standards criteria, adequacy of disclosures, compliance with laws and regulations, and the effectiveness of the internal control system. Evaluation is performed by the Supreme Audit Board in the form of a Financial Statement Opinion.

Performance accountability is regulated lastly in Presidential Regulation Number 29 of 2014, which requires local governments to report their activities to the government. Evaluation is carried out by the Ministry of Bureaucratic Reform and includes an assessment of performance planning, performance agreements, implementation of programs and activities, performance measurement, performance reporting, internal evaluation, and performance achievement.

The Local Government Implementation Report is regulated lastly in Government Regulation Number 3 of 2007. It covers the implementation of decentralization affairs and other general government duties. The Report is evaluated by the Ministry of Home Affairs in the form of a Performance Evaluation of Local Government Operations.

2. Empirical Studies

Debate continues regarding the effectiveness of public spending on human development. Gomanee et al. [9] found that public spending does not significantly influence the HDI, especially in low-income countries. In the health sector, Banik, Roy, and Hossain [10] found that health spending does not have a direct effect on improving human well-being. In the education sector, Jasmina and Oda [11] even identified a negative impact of regional education spending on school enrollment rates.

In sharp contrast, other studies have reported statistically significant results of public spending. Haile and Niño-Zarazua [7] and Haque and Khan [8] found a positive and significant role of government social spending on the HDI. Gupta, Verhoeven, and Tiongson [4] also demonstrated the positive and significant role of public spending in education on school enrollment rates, while an increase in health spending had an effect on reducing child mortality.

The difference in the findings above may be due to differences in the set of countries or regions studied, in the scope or the time period considered, or in the instruments used. More importantly, differences can arise as a result of important things being omitted, especially governance variables such as transparency, accountability, efficiency, and corruption. This is in accordance with previous studies related to the role of governance on human development [13-17]. Overall, these studies conclusively demonstrate the positive influence of governance on the achievement of human development and on increasing the effectiveness of public spending.

Morozumi and Veiga [29] specifically examined the role of accountability as one of the governance dimensions, but more in terms of the relationship between public spending and economic growth. The results of their study showed that government accountability plays an important role in increasing economic growth through capital spending but is not significant through current spending. The impact of capital spending on economic growth in high-accountability countries is greater than for low-accountability countries.

In Indonesia, although many studies have discussed public expenditure and human development, studies on the role of governance at the district level in Indonesia are still very limited. This might be due to the limited availability of data on governance at the district level for every year. Suryadarma [30] examined the effect of corruption on the effectiveness of public spending in the education sector in Indonesia, but at the provincial level. In his study, governance was proxied through the 2006 and 2008 Corruption Perception Index published by Transparency International Indonesia. The results of his study showed that public spending has a positive and significant effect and has a greater impact in areas with low levels of corruption.

Studies on accountability in Indonesia have mostly examined financial accountability, which is associated with the level of corruption [31-33]. None of these studies sought to measure accountability as a whole and associate

it with HDI. Therefore, this study will examine the role of overall accountability measurement in achieving HDI, as aggregate welfare, at the district level in Indonesia.

RESEARCH METHOD

The specification of the model used in this study is derived from the aggregate production function linking the input of production with the output. A simple production function that is often used to model various types of production is the Cobb-Douglas production function, which is expressed using the following formula.

$$Y = AK^\alpha L^\beta \qquad (1)$$

In equation (1), the level of output (Y) is determined by factor A as technology or productivity, K as the amount of capital, and L as the number of workers [34]. The greater the value of A, the more can be produced for a certain amount of capital (K) and labor (L). In addition to technology and productivity, A is also often used to describe all factors that can affect production output such as policy and management. In this study, A represents accountability associated with the level of output in the form of the HDI.

Our empirical strategy will employ accountability as a categorical variable that separates districts that have high accountability and low accountability, as used in the previous studies [6,29]. Classification into high and low accountability categories uses the median of the average local accountability index as used by Morozumi and Veiga [29]. Because accountability assessments may not be carried out every year by authorized institutions, the average accountability index is obtained according to the availability of data in the study period. We conduct z-tests on two district groups to show that each group is significantly different.

Due to the fact there is no overall accountability measurement at the level of local government, in this study, the initial stage comprises measurement of the quality of accountability of local governments in the form of a composite accountability index by using each of the accountability proxies; that is, financial, performance, and local administration. The calculation of the composite accountability index broadly follows the UNDP calculation methodology as used by Bhanumurthy, Prasad, and Jain [17]. According to the methodology, the index for each particular indicator of accountability is as follows.

$$Accountability\ index\ i = \left(\frac{Actual\ value - minimum\ value}{maximum\ value - minimum\ value}\right) \times 100$$

$$(2)$$

Furthermore, the aggregate or composite accountability index is obtained through weighted averages using the same weight for each accountability index, or is calculated using the arithmetic mean from the results of the assessment of each authorized institution.

$$Composite\ accountability\ index = \frac{1}{3}(Financial + Performance + Local\ Adm.)$$

$$(3)$$

The arithmetic mean was also employed by Baldacci et al. [6] and Bhanumurthy, Prasad, and Jain [17]. This is considered more appropriate since the assessments conducted by the authorities are not interrelated and each has its own focus, which means that the composite indexes can complement each other and provide overall accountability. The study also examines the correlation of each accountability proxy. The test results show that each proxy does not correlate highly, thus showing that each accountability proxy captures different institutional aspects from the local government. The high and low accountability group in each accountability proxy also shows different groups of districts.

Previous empirical studies that linked government spending to the HDI as a measure of aggregate welfare mostly used overall social spending or overall public spending [5,7-9]. As this study relates to the quality of spending,

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spending is separated by function to ascertain each effect on the HDI.

Some of the previous studies related to human development did not include the year effect in their specifications [5,9,17]. This omission of the effect of time changes can lead to problems arising from omitted variable bias due to time trends, annual specific shocks, policy changes, and other factors that affect the HDI over time. Therefore, this study includes the year effect in the model specifications.

Thus, the analysis in this study uses the following equation:

$$Y_{i,t} = \alpha + \beta_1(SPEND)_{j,i,t-1} + \beta_2(DGOV)_i + \delta X_{i,t} + \upsilon_t + \eta_i + \varepsilon_{i,t}$$

(4)

where the subscripts i and t denote district and year respectively. Y stands for HDI. SPEND is the proportion of total expenditure devoted to each area of priority expenditure and thus consisting of education, health, and public works expenditure. DGOV is an accountability dummy that shows the level and quality of governance where a value of 1 is given to districts that have high accountability. This value is constant throughout the study period.

X is a control variable that comprises per capita income in the preceding period [4,6,7,13], the percentage of poor people as a proxy for inequality [5,13,14,35], the ratio of the proportion of the primary sector to the tertiary sector as a means of describing structural changes or local economic structure [36], a dummy variable that distinguishes cities and districts to describe the level of urbanization [6,10,15,37], and also the size of the area. υ_t is a vector of time dummies or year effect capturing universal time trends. η_i denotes unobserved district-specific and time-invariant effects, and finally $\varepsilon_{i,t}$ represents an error term or disturbance term.

Government expenditure does not always have a direct impact on human development, so the study uses lagged time. Baldacci et al. [6] used a lagged time of t-1 on an average of five annual expenditures in education, while health expenditure used no lag. Sirag et al.[16] used lagged time t-1 for health expenditure. Therefore, this study uses lagged time t-1 for each expenditure variable to reflect the fact that spending does not have an instantaneous impact on the HDI.

To determine the modifying effect of accountability factors on public expenditure, we interact the two variables so that estimation follows the equation as follows.

$$Y_{i,t} = \alpha + \beta_1(SPEND)_{j,i,t-1} + \beta_2(DGOV)_i + \beta_3(SPEND)_{j,i,t-1}*(DGOV)_i + \delta X_{i,t} + \upsilon_t + \eta_i + \varepsilon_{i,t}$$

(5)

The overall estimation above uses the functional linear-log form as used by Haile and Niño-Zarazua [7], which shows absolute changes in the HDI values associated with each one percent change in the explanatory variables.

Due to limited data sources, this study uses the data available from 473 districts in Indonesia for the period 2012–2016. The data is still relevant and valid for examining medium- to long-term trends. The underlying relationship between variables is not directly dependent on a specific period. The pattern of relationships tends to remain stable over time.

We use data on public spending obtained from the Ministry of Finance. Local government accountability assessments were obtained from the Supreme Audit Board, Ministry of Bureaucratic Reform, and the Ministry of Home Affairs. HDI and control variable data such as per capita income and number of poor people were predominantly obtained from the Central Statistics Agency. All of the data were published with the exception of the assessment of accountability from the Ministry of Bureaucratic Reform, which was not published in detail. Summary statistics of the variables are presented in Table I.

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TABLE I.	DESCRIPTIVE STATISTICS				
Variable	Observation	Mean	Std.Dev	Min	Max
Human Development Index	1,792	67.26176	5.762519	37.82	85.32
Health Expenditure	1,792	.1090065	.036708	.0216261	.3210839
Education Expenditure	1,792	.3490867	.1085855	.0508787	.7086898
Public Work Expenditure	1,792	.1562928	.0764968	.0168057	.5935679
Urbanization (1=City)	1,792	.1953125	.3965517	0	1
Composite Accountability (1=High)	1,792	.5279018	.4993602	0	1
Financial Accountability (1=High)	1,792	.5987723	.4902838	0	1
Performance Accountability (1=High)	1,792	.5323661	.4990906	0	1
Local Adm. Accountability (1=High)	1,792	.5412946	.4984309	0	1
Per capita income	1,792	30905.08	37017.66	5213.858	378561.1
Percentage of poor people	1,792	12.54445	7.077342	1.52	41.81
Economic structure	1,792	1.340246	2.076279	.0015575	18.40358
Size of area	1,792	3663.05	5617.062	16.06	44071

Source: Author's calculations

RESULT AND DISCUSSION

Table II displays the robustness check and estimation results of the composite accountability variable (DGOV). The results show that the DGOV parameter in all model specifications has stable or robust results. Districts with high accountability are associated with an HDI of around 2 points.

To determine the consistency of the composite accountability dummy variable (DGOV) parameter, we also estimate using each component of composite accountability, namely performance accountability (DPERFORMANCE), local administrative accountability (DADMIN), and financial accountability (DFINANCIAL), which are classified using the same method as the composite accountability index. The results are presented in Table III and show that each component of accountability has the same direction and significance as composite accountability. Therefore, our next discussion will be more focused on the composite accountability index.

Tables II and III also show that individually, government expenditures have no significance for the HDI. The direction of expenditures is also not in line with the initial expectations of the study, whereby spending was expected to have a positive and significant role.

This insignificant result confirms the findings of several prior studies as previously explained that can be explained in several ways. First, as stated by Rosen and Gayer [24], the role of government can lead to "crowding out" when government provision substitutes provision from the private sector, with the effect that additional government provision in many cases causes very small net marginal effects or can even be ignored. This statement is empirically confirmed in Atukeren [12], which finds a substitution of public expenditure with private expenditure in developing countries.

Second, the insignificant result is caused by the declining role of the district government due to the increasing role of the provincial or central government. For example, in the field of education, senior secondary or high school, which had previously been under the responsibility and authority of the district/city government, now falls to the provincial government, which means that human resources and related assets have also transferred to the provincial government. Empirically, Jasmina and Oda [11] found that central government education spending has a positive and significant effect on net enrollment rates, while local government spending has a negative effect.

TABLE II. ESTIMATION RESULTS OF COMPOSITE ACCOUNTABILITY PARAMETERS (DGOV)

	(1) HDI	(2) HDI	(3) HDI	(4) HDI	(5) HDI	(6) HDI
Health Expenditure (ln)	-0.0342 (0.0431)	-0.0309 (0.0429)	-0.0304 (0.0431)	-0.0343 (0.0430)	-0.0267 (0.0430)	-0.0264 (0.0429)
Education Expenditure (ln)	-0.0574 (0.0520)	-0.0456 (0.0517)	-0.0445 (0.0520)	-0.0420 (0.0519)	-0.0375 (0.0518)	-0.0378 (0.0517)
Public work Expenditure (ln)	-0.00753 (0.0257)	-0.0119 (0.0255)	-0.0117 (0.0257)	-0.0126 (0.0256)	-0.0144 (0.0256)	-0.0145 (0.0255)
DGOV (1=high; 0=low)	3.806*** (0.532)	3.550*** (0.516)	2.452*** (0.395)	2.418*** (0.393)	2.304*** (0.393)	2.263*** (0.397)
Per capita income (ln)		0.865*** (0.161)	0.860*** (0.158)	1.024*** (0.155)	1.005*** (0.157)	0.965*** (0.159)
Urbanization (1=city;0=district)			8.682*** (0.498)	8.462*** (0.497)	7.501*** (0.598)	7.242*** (0.642)
Poor people (ln)				-0.355*** (0.111)	-0.356*** (0.111)	-0.361*** (0.111)
Size of area (ln)					-0.344*** (0.121)	-0.356*** (0.123)
Economic structure (ln)						-0.0744 (0.102)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
_cons	63.85*** (0.401)	55.37*** (1.630)	54.26*** (1.580)	53.54*** (1.599)	56.52*** (2.002)	57.06*** (2.042)
N	1792	1792	1792	1792	1792	1792

$^{*} p < 0.1, ^{**} p < 0.05, ^{***} p < 0.01$

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TABLE III ESTIMATION RESULTS OF EACH COMPONENT OF ACCOUNTABILITY						
	(1) HDI	(2) HDI	(3) HDI	(4) HDI	(5) HDI	(6) HDI
Health Expenditure (ln)	-0.0344 (0.0431)	-0.0313 (0.0428)	-0.0308 (0.0430)	-0.0351 (0.0430)	-0.0278 (0.0429)	-0.0276 (0.0428)
Education Expenditure (ln)	-0.0576 (0.0519)	-0.0461 (0.0516)	-0.0451 (0.0519)	-0.0433 (0.0518)	-0.0393 (0.0517)	-0.0397 (0.0517)
Public work Expenditure (ln)	-0.00753 (0.0256)	-0.0119 (0.0255)	-0.0117 (0.0256)	-0.0126 (0.0256)	-0.0145 (0.0255)	-0.0147 (0.0255)
DPERFORMANCE (1=high;0=low)	2.269*** (0.596)	2.211*** (0.578)	1.187*** (0.442)	1.185*** (0.439)	1.189*** (0.437)	1.177*** (0.440)
DFINANCIAL (1=high;0=low)	1.298** (0.565)	1.067* (0.548)	0.698* (0.416)	0.708* (0.413)	0.766* (0.411)	0.761* (0.414)
DADMIN (1=high;0=low)	1.858*** (0.608)	1.738*** (0.590)	1.497*** (0.447)	1.466*** (0.444)	1.281*** (0.447)	1.252** (0.450)
Per capita income (ln)		0.857*** (0.160)	0.855*** (0.158)	1.018*** (0.155)	1.005*** (0.156)	0.967*** (0.159)
Urbanization (1=city;0=district)			8.579*** (0.500)	8.358*** (0.499)	7.421*** (0.600)	7.190** (0.643)
Poor people (ln)				-0.342*** (0.111)	-0.343*** (0.111)	-0.348* (0.111)
Size of area (ln)					-0.332*** (0.122)	-0.344* (0.124)
Economic structure (ln)						-0.0638 (0.102)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
_cons	62.90*** (0.487)	54.59*** (1.642)	53.78*** (1.586)	53.03*** (1.605)	55.86*** (2.015)	56.39** (2.054)
N	1792	1792	1792	1792	1792	1792

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Another explanation is the characteristic of the impact of public spending that requires a lag or a long time, as shown by Baldacci et al. [6] who used a longer, five-year average lag for education spending compared to health spending. In this study, despite retesting using a longer lag, each type of expenditure remained insignificant.

TABLE IV INTERACTION RESULTS OF COMPOSITE ACCOUNTABILITY PARAMETERS (DGOV)			
	(1) HDI	(2) HDI	(3) HDI
Health Expenditure (ln)	-0.0299 (0.0429)	-0.178*** (0.0617)	-0.0261 (0.0429)
Education Expenditure (ln)	0.0348 (0.0703)	-0.0268 (0.0516)	-0.0354 (0.0517)
Public work Expenditure (ln)	-0.0126 (0.0254)	-0.0102 (0.0254)	-0.000566 (0.0356)
DGOV	2.109*** (0.407)	2.883*** (0.438)	2.216*** (0.405)
Per capita income (ln)	0.928*** (0.158)	0.947*** (0.158)	0.943*** (0.159)
Urbanization (1=city;0=district)	7.197*** (0.641)	7.357*** (0.643)	7.251*** (0.642)
Poor people (ln)	-0.366*** (0.110)	-0.335*** (0.110)	-0.362*** (0.111)
Economic structure (ln)	-0.0668 (0.102)	-0.0475 (0.102)	-0.0691 (0.102)
Size of area (ln)	-0.384*** (0.123)	-0.349*** (0.123)	-0.363*** (0.123)
DGOV*Education Expenditure (ln)	-0.116 (0.0819)		
DGOV*Health Expenditure (ln)		0.263*** (0.0776)	
DGOV*Public work Expenditure (ln)			-0.0257 (0.0428)
Year effect	Yes	Yes	Yes
_cons	57.75*** (2.024)	56.77*** (2.039)	57.37*** (2.041)
N	1792	1792	1792

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table IV presents the results of the interaction between the level of accountability and each type of spending. The results show that significant interaction is only found in health spending, while the interaction on education and public works spending is not significant.

In Table IV, once the indicators of governance, namely the level of accountability, are included, health expenditure becomes significantly negative in local government with a low level of accountability and positive in local government with high accountability. This shows that health expenditure is not effective in improving the quality of life of people under local governments with low accountability. In areas with a high level of accountability, every 1% increase in health

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expenditure is associated with an increase in the HDI value of 0.085 points (0.263–0.178). These results are also consistent when using each indicator of accountability.

The negative results of health spending confirm the research findings of Hassan et al. [38] and Berger and Messer [39]. Hassan et al. [38] found that public health spending is not significant in reducing infant mortality and even has a significant negative correlation with life expectancy in South Asian countries. Berger and Messer [39] also found that public health financing is negatively associated with better levels of health in OECD countries. While the positive and significant results of expenditure interactions with governance confirm several previous studies [6,13,15,16], which overall show that governance increases the effectiveness of public health spending in improving health outcomes.

Our interpretation related to the significance of accountability in health spending, among others, is because the impact of health sector programs, for example in the form of medical services and treatment, tends to be faster and directly felt by the community compared to education and public works programs. Therefore, if not implemented accountably there will be an immediate direct impact on the quality of life of the community.

All of the above-presented tables also include an estimation of the several control variables used in the study. One consistent result in all specifications is that per capita income in the preceding period is positively and significantly correlated with the HDI. Thus, every 1% increase in per capita income is associated with an increase in the HDI of around 0.9 points. This is not surprising and has been confirmed in many previous empirical studies [4,6,13,14,16]. Better economic conditions are associated with better access to an improved quality of life.

For robustness checks, in addition to stepwise regression, we compare our results for all of the specifications above using other panel data estimators such as the Fixed Effects Model and Pooled OLS. The results obtained are similar.

CONCLUSION AND IMPLICATION

The results of the study reveal several conclusions. First, local expenditures in the education, health, and public work sectors have no significant correlation with an increase in the HDI. This does not correspond with the initial expectations of the study. It does not mean, however, that local expenditure has no effect or the amount must be reduced; rather, the results show that allocating additional funds to local expenditure will not increase the HDI unless accompanied by other policies such as improving the quality of human resources and the quality of governance, including accountability. This is proven empirically through the results of the interaction of health spending with the level of accountability.

Second, better accountability is associated with better HDI achievement. In the health sector, the results of the interaction show the important role of accountability for the effectiveness of expenditure. Therefore, increasing accountability needs to be both a priority and a target for improvement, especially in districts that achieve low accountability.

Third, per capita income is an important factor in increasing HDI. This proves the statement that economic growth is the principal means in achieving ultimate development goals.

The expected implications from this research is that local governments should develop the capacity of government officials through education and training, and optimize the function of internal auditors in reviewing and monitoring the implementation of local government accountability systems on a regular basis.

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RESEARCH LIMITATIONS

This study uses governance indicators in the form of local government accountability that are still general. This is due to the unavailability of more specific governance measures in certain fields at the district/city level. In addition, the research period used is also may not long enough to accommodate the long-term impacts of public spending.

We suggest that subsequent research directly links public spending, governance, and human development by using more specific measurement alternatives, and using longer time frames. Further research can use more recent time data to strengthen the findings and improve accuracy.

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