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REGIONAL REVENUES AND HUMAN DEVELOPMENT INDEX: AN EMPIRICAL EVIDENCE FROM INDONESIA

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ABSTRACT

Human development is a central indicator of regional well-being and plays a critical role in assessing the effectiveness of public policies; therefore, this study investigates the relationship between local government revenues and the Human Development Index (HDI) in Indonesia. Using panel data from 538 to 541 local governments observed during 2014–2016, the analysis examines both the overall HDI and its core dimensions of long and healthy life, knowledge, and standard of living. HDI data were obtained from the Central Statistics Agency, while revenue variables were sourced from the Directorate General of Fiscal Balance. Regression estimations reveal that local original income (PAD) and special allocation funds (DAK) exhibit positive associations with HDI and its dimensions. In contrast, general allocation funds (DAU) and revenue sharing funds (DBH) show negative relationships with HDI outcomes. These findings indicate that regions with stronger fiscal independence tend to achieve higher human development outcomes, whereas dependence on general transfers may reflect structural underdevelopment or inefficiencies in fund utilization. The study highlights the importance of strengthening local fiscal capacity and improving the effectiveness of intergovernmental transfers to enhance regional human development.

Keywords: Human Development Index (HDI), Local Original Income (PAD), Revenue Sharing Funds (DBH), General Allocation Funds (DAU), Special Allocation Funds (DAK).

INTRODUCTION

Improving the quality of life of the Indonesian population has been a central government priority in recent years, as reflected in the fifth pillar of the "Nawacita" agenda. Its implementation includes programs such as "Smart Indonesia," which focuses on strengthening education and training, and initiatives to enhance public welfare through "Indonesian Smart Work" and "Indonesia Prosperous," supported by land reform, housing programs like Kampung Deret and subsidized flats, and social protection measures introduced in 2019. Human resources are positioned as the key element in realizing the Nawacita vision (Soleman; Noer, 2017).

According to the Human Development Report 2016, Indonesia's HDI reached 68.9 in 2015, placing the country in the "moderate" human development category and ranking 113th out of 188 countries, as well as fifth in ASEAN after Singapore, Brunei Darussalam, Malaysia, and Thailand (UNDP, 2016). By 2016, Indonesia's HDI had risen to 70.18, marking its transition into the "high" human development category, which represents a significant milestone in the nation's progress. This improvement was reflected in several key indicators such as life expectancy rising to 70.90 years, the average years of schooling for adults aged 25 and above reaching 7.95 years, expected years of schooling increasing to 12.72 years, and annual per capita expenditure reaching IDR10,420,000. These improvements illustrate Indonesia's steady progress in enhancing the quality of life of its population.

Regional governments have great authority to generate revenue and play an independent allocation role in setting development priorities through regional autonomy and fiscal decentralization. Regional autonomy plays an important role in achieving local government performance (Sutopo; Siddi, 2018). With the autonomy and fiscal decentralization, development is expected to be more equitable in accordance with local aspirations to develop regions according to their respective potentials in order to improve people's welfare. Some indicators of regional development performance are by looking at the results of development outputs which are reflected in the Gross Regional Domestic Product (GRDP) and community welfare through HDI indicator. For example, in 2014 to 2016 local governments in Indonesia had an average HDI of 67.05. The city of Yogyakarta consistently achieved the highest levels, with scores of 83.78 in 2014, 84.56 in 2015, and 85.32 in 2016, while Nduga in Papua Province had the lowest scores of 25.38, 25.47, and 26.56 over the same years. Based on these data, there has been a significant disparity between local governments in Indonesia.

In carrying out the function of service to the community, local governments need funds. Based on Government Accounting Standards as outlined in Government Regulation No. 71 of 2010, the main sources of local government funds are classified as local original income and transfer funds from the central government to the regions include balancing funds, special autonomy funds, and adjustment funds (PP_71, 2010). However, the development of regencies and cities in Indonesia to date generally still relies on transfer funds from the central government which include DBH, DAU, and DAK.

The current study extends the previous studies as follows. First, previous studies on the HDI were conducted in certain areas in Indonesia, such as in districts/cities throughout the province of West Nusa Tenggara (Aryawati; Sudana, 2018) and in Central Java (Mirza, 2011) and not examine the dimensions of HDI. This study uses a sample of local governments throughout Indonesia and examines the HDI and its dimensions. Second, previous studies examined the effect of regional revenue on spending (eg (Amalia *et al.*, 2015; Hidayah; Setiyawati, 2014; Kusumadewi; Rahman, 2007; Prakosa, 2004; Solikin, 2016). Third, this study uses a more recent observation period (up to 2016), while previous studies used an observation period before 2016 including 2006-2009 (Mirza, 2011) and 2009-2013(Amalia *et al.*, 2015).

Human development is not only a social outcome but also a central pillar in regional development theory, where improvements in health, education, and living standards are viewed as essential drivers of territorial growth and long-term regional competitiveness. As emphasized in the regional development literature, disparities in human capital formation are a key determinant of uneven regional trajectories, particularly in developing countries with strong decentralization frameworks (Rodríguez-Pose, 2013). Fiscal capacity and intergovernmental transfers shape human development outcomes becomes crucial for explaining why some regions progress more rapidly than others. This study contributes to the field by empirically linking local revenue structures to the HDI across Indonesian regions, thereby positioning human development as both an indicator and a mechanism of regional development. By examining the HDI and its dimensions using nationwide data, the study provides evidence on how fiscal decentralization policies may reduce or reinforce territorial disparities, thus advancing scholarly discussions on regional governance and development outcomes in decentralized states.

THEORETICAL AND REGULATORY BASIS

The theory that underlies the research hypotheses is the theory of public finance. According to public finance theory Musgrave; Musgrave (1989) economic activities for the public interest and/or non-profit activities cannot be carried out by the market. Therefore, public obligations in the fields of education and health that are not touched by the market are the government's obligation to provide them. In carrying out services to the community, the government requires funds both from the local area and from the central government. Local governments with relatively large sources of funds should have a greater ability to provide services to the community. One of the indicators of success is the quality of human resources, which can be measured by the HDI in the area of the local government concerned.

From the regulatory aspect, the relationship between local government revenues and the human development index is reflected in several articles in Law Number 32 of 2004 concerning Regional Government (UU_32, 2014). Regional governments in implementing autonomy have rights and obligations which are manifested in the form of a regional government work plan and are described in the form of regional revenue, expenditure, and financing which are managed in the regional financial management system (Article 23). In fulfilling local government obligations, regional expenditures are prioritized to protect and improve the quality of people's lives (Article 167 Point 1) which is manifested in the form of improving basic services, education, providing health service facilities, social facilities and proper public facilities, as well as developing a social security system. (Article 167 Point 2). Sources of regional revenue consist of PAD, balancing funds, and other legitimate revenue (Article 157). Balancing funds include DBH, DAU, and DAK (Article 159). Other relevant laws and regulations are Law Number 36 of 2009 concerning Health (UU_36, 2009), Law Number 20 of 2003 concerning the National Education System (UU_20, 2003), and Minister of Finance Regulation Number 84 of 2009 (PMK_84, 2009).

LOCAL ORIGINAL INCOME AND HUMAN DEVELOPMENT INDEX

The HDI is a composite index consisting of three dimensions, namely: (1) “long life and healthy life”, “knowledge”, and “decent standard of living”. HDI is used to compare human development covering these three dimensions for all countries around the world (UNDP, 2016). HDI is used to classify whether a country is a developed country, a developing country or an underdeveloped country and measures the effect of economic policies on the quality of life. HDI is also applied at the local government level. Local governments that have a high HDI can reflect the quality of the local government in terms of the human resources of the local government.

PAD is revenue that is sourced and collected by the regional government itself. Sources of PAD include local taxes, regional retributions, profits from regionally-owned enterprises (BUMD), and other legitimate local revenue. Local original income aims to provide flexibility to regions in optimizing their own regional funding potential in the implementation of regional autonomy as a manifestation of the principle of decentralization. In allocating capital expenditures, local governments must really adjust them to regional needs by taking into account the PAD received. The size of the PAD will determine the size of the Capital Expenditure. The types of PAD are classified into 4 (four) namely funds from regional tax collections, funds from regional levies, funds from separated regional wealth management and other legitimate PAD. The role of PAD in this case greatly determines regional financial independence. This means that as PAD increases, it is expected that the HDI will also increase. The increase was caused by the allocation of local revenue that has been used properly so that the planned activities can run well. PAD affects local government spending (Ridwan, 2010). PAD has a positive effect on local government financial independence (Tahar; Zakhiya, 2011). Siddi (2016) found that local revenue has a positive effect on the performance of local `government administration. The independence of local governments has a positive effect on the human development index (Aryawati; Sudana, 2018; Siregar; Pratiwi, 2017).

Local governments need sources of funds in providing services to the community. PAD is one source of local government funds. If local governments are able to spend PAD effectively for human development, PAD is expected to have a positive effect on HDI and on the dimensions of HDI. This leads to the following hypotheses:

H1: Local original income is positively associated with the human development index.

H1a: Local original income is positively associated with long and healthy life.

H1b: Local original income is positively associated with the knowledge.

H1c: Local original income is positively associated with decent standard of living.

REVENUE SHARING FUNDS AND HUMAN DEVELOPMENT INDEX

DBH is a fund sourced from APBN revenues allocated to regions based on a certain percentage figure to fund regional needs in the context of implementing decentralization (UU_33, 2004). With the fulfillment of regional needs, regional development is expected to be further enhanced. This can be shown by the human development index. Subowo; Wati (2010) found that balancing funds, one of which is a profit sharing fund, is positively correlated with capital expenditures. PAD has a positive effect on capital expenditure (Subowo; Wati, 2010), and capital expenditure has a positive effect on the human development index (Mirza, 2011).

DBH is one type of local government revenue. Local governments that have relatively large DBH (eg natural resources) should be able to utilize the proceeds from these funding sources to provide services to the community which can be seen in the form of increasing human development. If the local government is able to effectively use the DBH for human development, the larger the DBH, it is expected that the human development index will also be higher. The above review leads to the following hypotheses:

H2: Revenus sharing funds has a positive association with the human development index.

H2a: Revenus sharing funds has a positive association with long and healthy life.

H2b: Revenus sharing funds has a positive association with the knowledge.

H2c: Revenus sharing funds has a positive association with a decent standard of living.

GENERAL ALLOCATION FUND AND HUMAN DEVELOPMENT INDEX

The DAU aims to equalize financial capacity between regions, which is intended to reduce inequality in financial capacity between regions through the application of a formula that takes into account the needs and potential of the region. The DAU of a region is determined by the size of the fiscal gap of a region, which is the difference between regional needs and regional potential. Through Law Number 23 of 2014 (UU_23, 2014) which is accompanied by Law Number 32 of 2015 (UU_9, 2015) it has been regulated regarding the administration of local government in the context of preparing the Regional Government Work Plan (RKPD). The RKPD is the basis for drafting the Regional Revenue and Expenditure Budget (APBD). Thus, there is a significant transfer in the APBN from the central government to local governments, and local governments can use the DAU based on Law no. 32 of 2004 to provide better services to the community so that it will create a healthy life and longer life expectancy, improve the quality of education and the standard of living of the community. The DAU has a negative effect on local government independence (Tahar; Zakhiya, 2011).

DAU is the amount of funds allocated by the Central Government to each Autonomous Region (Province/Regency/City) in Indonesia annually as development funds. DAU is one component of expenditure in the APBN, and is one component of revenue in the APBD. However, a flypaper effect can occur, namely that the influence of DAU on regional spending is greater than the effect of PAD on regional expenditures (Amalia *et al.*, 2015; Kusumadewi; Rahman, 2007; Solikin, 2016; Subadriyah, 2017). Other previous studies such as Mirza (2011) found that capital expenditures had a positive and significant effect on HDI, Aryawati; Sudana (2018) found that balancing funds which included general allocation funds, special allocation funds, and revenue-sharing funds had a positive effect on economic growth.

Local governments have the opportunity to obtain transfer revenues from the central government, known as the DAU. The purpose of the DAU is equitable development through the transfer of funds from the central government to local governments because local governments in general have not been able to fund their service activities using a local source of funds called PAD. DAU that is used effectively to improve services to the community in the form of human development will increase that human development. So the bigger the DAU, the higher the HDI should be. The hypothesis of the relationship between DAU and HDI and the dimensions of HDI are formulated as follows:

H3: The general allocation funds has a positive association with the human development index.

H3a: The general allocation funds has a positive association with long and healthy life.

H3b: The general allocation funds has a positive association with the knowledge.

H3c: The general allocation funds has a positive association with a decent standard of living.

SPECIAL ALLOCATION FUNDS AND HUMAN DEVELOPMENT INDEX

Law Number 33 of 2004 concerning the financial balance between the central government and regional governments explains that DAK is a transfer fund from the central government to regional governments which is used to carry out the development of infrastructure and public facilities in regencies/cities (UU_33, 2004). DAK is intended to help finance special activities in certain regions which are regional affairs and in accordance with national priorities, in particular to finance the needs for basic public service facilities and infrastructure that have not yet reached certain standards or to encourage the acceleration of regional development. The DAK is fully used for capital expenditures to improve public facilities, in other words, no part of the DAK is used for development operational costs such as official travel expenses and so on. Aryawati; Sudana (2018) found that the balancing fund which includes general allocation funds, special allocation funds, and revenue-sharing funds has a positive effect on economic growth. Hidayah; Setiyawati (2014) found that special allocation funds had no impact on direct spending. Amalia *et al.* (2015) found that special allocation funds had a negative effect on regional spending.

DAK is intended to fund certain specially designed local government programs including programs related to human development. Local governments that are able to develop good programs and are able to use DAK for this purpose effectively will be able to improve human development. The hypotheses of the relationship between DAK and the HDI and the dimensions of the HDI are formulated as follows:

H4: Special allocation funds has a positive association with the human development index.

H4a: Special allocation funds has a positive association with long and healthy life.

H4b: Special allocation funds has a positive association with the knowledge.

H4c: Special allocation funds has a positive association with a decent standard of living.

METHODOLOGY

This study employs a quantitative research design using panel data regression models to examine the relationship between local government revenues and human development index. Panel data methods are widely used in empirical studies involving regional economic development because they allow researchers to control for unobserved heterogeneity across entities and over time (Wooldridge, 2010). This approach is particularly suitable for Indonesia, where local governments differ substantially in socioeconomic characteristics, administrative capacity, and fiscal structures.

STATISTICAL MODELS

To test the association between PAD, DBH, DAU, DAK and HDI, model (1) was used. Model (2) is used to test the association of PAD, DBH, DAU, and DAK with the Long and Healthy Life Index (UPS), while to test these independent variables the Knowledge Index and the Decent Standards of Living Index are used, respectively, the model (3) and model (4).

$$HDI = \beta 0 + \beta 1PAD + \beta 2DBH + \beta 3DAU + \beta 4DAK + \beta 5SIZE + \varepsilon \quad (1)$$
$$UPS = \beta 0 + \beta 1PAD + \beta 2DBH + \beta 3DAU + \beta 4DAK + \beta 5SIZE + \varepsilon \quad (2)$$
$$PENG = \beta 0 + \beta 1PAD + \beta 2DBH + \beta 3DAU + \beta 4DAK + \beta 5SIZE + \varepsilon \quad (3)$$
$$SHL = \beta 0 + \beta 1PAD + \beta 2DBH + \beta 3DAU + \beta 4DAK + \beta 5SIZE + \varepsilon \quad (4)$$

Descriptions:
HDI = the human development index
UPS = long and healthy life index
PENG = knowledge index
SHL = decent standard of living index
PAD = local original income
DBH = revenue sharing funds
DAU = general allocation funds
DAK = special allocation funds
SIZE = natural logarithm of total revenue
β0 = constant
β1, β2, β3, β4, β5, β6 = variable coefficient
e = Error.

VARIABLE MEASUREMENT

Variable	Measurement	Sources
HDI	$IPM = \sqrt[3]{I_{AHH} \times I_{knowledge} \times I_{expenditure}} \times 100$	the Central Statistics Agency
UPS	$I_{AHH} = \frac{AHH - AHH_{min}}{AHH_{max} - AHH_{min}}$	the Central Statistics Agency
PENG	$I_{HLS} = \frac{HLS - HLS_{min}}{HLS_{max} - HLS_{min}}$ $I_{RLS} = \frac{RLS - RLS_{min}}{RLS_{max} - RLS_{min}}$ $I_{knowledge} = \frac{I_{HLS} + I_{RLS}}{2}$	the Central Statistics Agency
SHL	$I_{expenditure} = \frac{I\,(expenditure) - I\,(expenditure_{min})}{I\,(expenditure_{max}) - I\,(expenditure_{min})}$	the Central Statistics Agency
PAD	$\frac{PAD}{Regional\ Government\ Revenue}$	the Directorate General of Fiscal Balance, Ministry of Finance
DBH	$\frac{DBH}{Regional\ Government\ Revenue}$	the Directorate General of Fiscal Balance, Ministry of Finance
DAU	$\frac{DAU}{Regional\ Government\ Revenue}$	the Directorate General of Fiscal Balance, Ministry of Finance
DAK	$\frac{DAK}{Regional\ Government\ Revenue}$	the Directorate General of Fiscal Balance, Ministry of Finance

The HDI is categorized into four groups of human development status.

1. “very high” group : HDI ≥ 80
2. “High” group : 70 ≤ HDI < 80
3. “medium” group : 60 ≤ HDI < 70
4. “low” group : HDI < 60

DATA AND SAMPLE

The data used in this study is secondary data obtained from several sources. Data on PAD, DBH, DAU, and DAK are taken from the tabulation of data on budget realization reports provided by the Directorate General of Fiscal Balance, Ministry of Finance. HDI data is taken from the website of the Central Statistics Agency. The consideration of using secondary data is that HDI data and dimensions of HDI are carried out by a large-scale and internationally recognized institution so that the validity and reliability of the data is guaranteed. In addition, data on independent variables which include PAD, DBH, DAU, and DAK are sourced from reports that have been audited by a professional state institution, namely the Supreme Audit Agency (BPK) so as to ensure the validity and reliability of the data.

The sample comprises provincial, regency, and city governments across Indonesia for the 2014–2016 period. A purposive sampling method was applied to ensure complete availability of HDI data and regional revenue information for all units of analysis. The criteria required that (1) HDI data for 2014–2016 be fully available on the BPS website, and (2) revenue data—including PAD, DBH, DAU, and DAK—be complete in the Ministry of Finance's tabulated reports. The results of the sample selection are presented in Table 1.

Table 1 | Number of Regional Government Observations in 2014-2016 as Sample

Local Government	Number of Observations			
	2014	2015	2016	2014-2016
City	93	93	93	279
Regency	411	414	414	1239
Province	34	34	34	102
Total	538	541	541	1620

RESULTS AND DISCUSSION

DESCRIPTIVE STATISTICS

The descriptive statistics are presented in Table 2. The HDI has a mean value of 67.0519 in the range of 25.3800 (Nduga District - Papua Province 2014) to 85.3200 (Yogyakarta City 2016). Long and healthy life (UPS) has a mean value of 68.6885 in the range of 53.6000 (Nduga District - Papua Province 2014) to 77.4600 (Sukoharjo District 2016). The HDI score range is wider than the UPS score range. The knowledge (PENG) has a mean value of 10.0963 in the range of 1.3950 (Nduga District - Papua Province 2014) to 14.8000 (Banda Aceh City 2016), while the SHL has a mean value of 9.3682 in the range of 3.6070 (Nduga District - Papua Province 2014) to 19.0840 (Denpasar City 2016). The range of knowledge scores is wider than the range of SHL scores.

The local government that has the highest PAD is Badung District - Prov Bali 2016, while the local government that has the lowest PAD is Arfak Mountains District - West Papua Province 2014. The local government that has the highest DBH is Bengkalis District 2014, while the local government that has the lowest DBH is Tegal District 2016. The local government with the highest DAU is Tegal District 2016, while the local government that has the lowest DAU is Bengkalis District 2015. The local government with the highest DAK is East Nusa Tenggara Province 2016, while the local government with the lowest DAK is Bengkalis District 2015.

Table 2 | Descriptive Statistics

Variabel	Mean	Median	Maximum	Minimum	Std. Dev.
HDI	67.0519	66.9900	85.3200	25.3800	6.6695
UPS	68.6885	69.0800	77.4600	53.6000	3.6251
PENG	10.0963	10.0250	14.8000	1.3950	1.4339
SHL	9.3682	9.2390	19.0840	3.6070	2.3948
PAD	0.1175	0.0790	0.8233	0.0021	0.1188
DBH	0.0808	0.0371	0.8369	0.0032	0.1200
DAU	0.5195	0.5461	0.9208	0.0000	0.1449
DAK	0.1056	0.0930	0.3642	0.0000	0.0699
PAD (IDR Million)	404503	88030	36888018	429	1890304
DBH (IDR Million)	167644	47020	12388583	5448	551965
DAU (IDR Million)	728784	583874	48860342	0	1719662
DAK (IDR Million)	154578	97477	7596342	0	363554

N = 1620. HDI = Human Development Index, UPS = Long and Healthy Life Index, PENG = Knowledge Index, SHL = Decent Standard of Living Index, PAD = Local Original Income, DBH = Revenue Sharing Funds, DAU = General Allocation Funds, DAK = Special Allocation Funds (PAD, DBH, DAU, DAK, each divided by the total revenue).

The mean value for the largest independent variable is the general allocation fund (DAU), followed by local original income (PAD), special allocation funds (DAK), and profit sharing funds (DBH).

REGRESSION RESULTS AND DISCUSSION

The regression results are presented in Table 3 which shows that the F-Statistic is significant at the 1 percent level which indicates that the model is fit. The relatively high adjusted R-squared indicates that the effect of the independent variables tested on the dependent variable is relatively high. Based on the Redundant Fixed Effects Tests and Hausman Test, the most appropriate model is the fixed effect. Therefore, the discussion of the regression results is based on the results of the fixed effects model. The systematic discussion follows the order of the formulation of the hypothesis.

Table 3 | Results of Regression Hypothesis Testing with Dependent Variables Human Development Index, Long and Healthy Life, Knowledge, Decent Standard of Living with Control Variables Size of Local Government – Fixed Effect

Variable	Dependent Variable							
	HDI		UPS		PENG.		SHL	
	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.
PAD	1.848	0.004[a]	0.417	0.077[c]	0.429	0.028[b]	1.050	0.000[a]
DBH	-3.206	0.000[a]	-1.037	0.000[a]	-0.887	0.000[a]	-0.424	0.001[a]
DAU	-2.732	0.000[a]	-1.044	0.000[a]	-0.813	0.000[a]	-0.193	0.071[c]
DAK	5.332	0.000[a]	1.044	0.000[a]	1.174	0.000[a]	2.302	0.000[a]
SIZE	0.396	0.000[a]	0.067	0.004[a]	0.094	0.000[a]	0.091	0.000[a]
C	56.915	0.000[a]	67.289	0.000[a]	7.807	0.000[a]	6.614	0.000[a]
N	1620		1620		1620		1620	
R-squared	0.998		0.999		0.995		0.997	
Adjusted R-squared	0.996		0.998		0.993		0.996	
F-statistic	806.568		1757.126		399.191		748.300	
Prob(F-statistic)	0.000[a]		0.000[a]		0.000[a]		0.000[a]	

HDI = Human Development Index, UPS = Long and Healthy Life Index, PENG = Knowledge Index, SHL = Decent Standard of Living Index, PAD = Local Original Income, DBH = Revenue Sharing Funds, DAU = General Allocation Funds, DAK = Special Allocation Funds. PAD, DBH, DAU, and DAK are divided by total revenue, respectively); Size = Ln Revenue.
a, b, and c are significant at the 1 percent, 5 percent, and 10 percent levels, respectively.

The regression results in Table 3 show that PAD and DAK have significant positive effects on the HDI and all of its component dimensions, indicating that higher fiscal capacity and targeted transfers are associated with improvements in health, education, and living standards. In contrast, DBH and DAU display consistently negative and significant coefficients across the models, suggesting that regions receiving larger portions of these transfers tend to be those with lower human development outcomes, rather than indicating a detrimental effect of the funds themselves.

RELATIONSHIP BETWEEN LOCAL ORIGINAL INCOME AND HUMAN DEVELOPMENT INDEX

Hypothesis 1 states that PAD has a positive effect on the human development index. The regression results in Table 3 show that the PAD coefficient with the dependent variable of HDI is positively significant at the 1 percent level. The PAD coefficient with the dependent variable UPS is positive and significant at the 5 percent level, while the PAD coefficient with the dependent variables PENG and SHL is positive and significant at 1 percent. Thus, the regression results support H1, H1a, H1b, and H1c.

The findings of this study are in line with the purpose of PAD, which is to provide flexibility to regions in optimizing their own regional funding potential in the implementation of regional autonomy as a manifestation of the principle of decentralization. Regional governments in allocating capital expenditures must really adjust them to regional needs by taking into account the PAD received. The amount of PAD will determine the amount of capital expenditure. The role of PAD in this case greatly determines regional financial independence. The findings of this study indicate that as PAD increases, the HDI also increases (although not evenly distributed, namely only in Java). The increase was caused by the allocation of local revenue that has been used properly so that the planned activities can run well. PAD affects local government spending (Ridwan, 2010). The results of this study support the finding that PAD has a positive effect on local government financial independence (Tahar; Zakhiya, 2011). The results of this study also support the findings of Siddi (2016), namely that local revenue has a positive effect on the performance of local government administration and supports the finding that local government independence has a positive effect

on the human development index (Aryawati; Sudana, 2018; Siregar; Pratiwi, 2017). In line with that, Rusmin (2014) also found a link between PAD and HDI. The positive influence of PAD on HDI indicates that the allocation of government spending is in line with human development. Fattah; Muji (2012) found that the allocation of spending on education, health and infrastructure has a positive and significant effect on increasing the human development index.

RELATIONSHIP BETWEEN REVENUE SHARING FUNDS AND HUMAN DEVELOPMENT INDEX

Hypothesis 2 states that DBH has a positive effect on the human development index. The regression results in Table 3 show that the DBH coefficient is significantly negative at the 1 percent level for the HDI and the all dimensions as the dependent variable. The results of this study do not support H2, H2a, H2b, and H2c. The larger the revenue-sharing fund in a region, the lower the HDI and HDI dimensions. The findings of this study are not in line with the results of the study by Subowo; Wati (2010) which found that balancing funds, one of which is a profit sharing fund, is positively correlated with capital expenditures.

A study on the effectiveness of the use of natural resource revenue-sharing funds (DBH-SDA) by (Saputra; Lumbantoruan, 2016) found that the large contribution of DBH-SDA to regional spending should open up opportunities for regional fiscal capacity to optimize poverty reduction programs. Several districts already have poverty reduction programs with large fiscal policies, such as Indragiri Hulu Regency and West Sumbawa Regency. However, most of the regional poverty reduction programs are still less than optimal in overcoming the problem of poverty. In addition, related to the management of the Natural Resources DBH and the optimization of poverty reduction programs in the regions, there are several aspects that are in the spotlight of the local government, namely the DBH-SDA cannot be directly allocated to poverty reduction programs, is constrained by the political budget process between the executive and the legislature, does not inclusion of poverty reduction into development priority sectors in the RPJMD, limited fiscal space and discrepancies between estimates and realization of natural resource DBH which create uncertainty in budget allocations in the regions.

RELATIONSHIP BETWEEN GENERAL ALLOCATION FUNDS AND HUMAN DEVELOPMENT INDEX

Hypothesis 3 states that DAU has a positive effect on the human development index. The regression results in Table 3 show that the DAU coefficient is negative and significant at the 1 percent level for HDI, the dimension of UPS, and PENG as the dependent variable. DAU coefficient for the dimension of SHL is negative and significant at the 10 percent level. These results do not support H3, H3a, H3b, and H3c. This means that the greater the DAU, the lower the HDI, UPS, PENG, and SHL. This finding is not in line with the results of Aryawati; Sudana's (2018) research which found that balancing funds which include general allocation funds, special allocation funds, and profit-sharing funds have a positive effect on economic growth. However, the findings of this study are consistent with the results of the Dewata *et al.* (2018) study which found that the level of dependency on central government as measured by the ratio of DAU to total revenue has a negative effect on local government performance.

The regression results show the negative effect of DAU on HDI. This could be due to the paper effect, namely that the influence of DAU on regional expenditures is greater than the effect of PAD on regional expenditures (Amalia *et al.*, 2015; Kusumadewi; Rahman, 2007; Solikin, 2016; Subadriyah, 2017). This indicates inefficiency in the use of funds and indicates the dependence of local government funding on the central government. The DAU has a negative effect on local government independence (Tahar; Zakhiya, 2011). Findings in Indonesia by Lewis (2017) show that the consistently beneficial impact of less corrupt local spending on access to services is to decrease with increasing reliance on intergovernmental transfers. The results of a study in Ghana by Appiah-Agyekum *et al.* (2013) show that the effectiveness of monitoring disbursement and utilization of funds is strongly influenced by the relationship between the chief executive of the local government authority and members of parliament in the local government area. Another study in Ghana by Olurankinse (2012) found that the Board was unfocused and not persistent in overseeing the use of funds. Therefore, the study recommends the need to strengthen local government internal control mechanisms to prevent unnecessary diversion of funds. Correspondingly, Ahmad; Talib (2012) in a study in Pakistan found that the basic goal of decentralization seems difficult to achieve because

only power is transferred to the local level, while support for community capacity building and community access to resources is very little.

The DAU aims to reduce or close the regional fiscal gap, the region is able to meet needs based on certain priorities, and encourage the progress of a region. However, there are problems in its implementation, a lot of DAU is absorbed in personnel expenditures, and this is not in line with downsizing employees according to existing needs (Yudartha, 2018). In addition, the use of the DAU is closely related to the trade-off between the center and the regions, especially in the financial sector, as follows.

First, it is ideologically and technically ambivalent, meaning that employee problems tend to be part of a pendulum that leads to a game of interests between the center and the regions. Second, the recruitment of employees based on policies that tend to be bottom-up (influenced by the center) actually results in employee recruitment that is not in accordance with the needs but adds to the problem because the government has to pay for these employees both while active as employees and after retirement. Third, DAU for development is difficult to implement. The DAU that is absorbed a lot for personnel expenditure is very ineffective. The increase in DAU should not be carried out when the state budget items are always in deficit. Fourth, the ineffectiveness of the use of the DAU because there is no clear performance measure of the DAU. Regions just use the DAU as long as it can be absorbed properly without prioritizing the outcome and impact of the DAU itself.

RELATIONSHIP BETWEEN SPECIAL ALLOCATION FUND AND HUMAN DEVELOPMENT INDEX

Hypothesis 4 states that the special allocation fund has a positive effect on the HDI. The regression results in Table 3 show that the DAK coefficient is positive and significant at the 1 percent level. The regression results also show that the DAK coefficient with the dependent variable HDI dimensions which include “long and healthy life” (H4a), “knowledge” (H4b), and “decent standard of living” (H4c) is also positive and significant at level 1 percent. Thus, the results of this study support hypothesis 4. This means that local governments with large DAK tend to have high HDI and dimensions.

The positive influence of DAK on HDI is an indicator of the success of DAK. The results in Table 4 and Table 5 are in line with the results of Aryawati; Sudana's (2018) research which found that balancing funds which include general allocation funds, special allocation funds, and profit-sharing funds have a positive effect on economic growth. The results in Tables 3a and 3b are in line with the results of Amalia *et al.* (2015) who found that special allocation funds had a negative effect on regional spending.

ADDITIONAL ANALYSIS

Additional analysis was conducted by testing the hypotheses for local governments in Java and local governments outside Java. The test results of the additional analysis are presented in Table 4. The results of the analysis in Table 6 show that the hypothesis testing using a sample of local governments in Java and outside Java is consistent except for the test of hypothesis 1, hypothesis 1a, and hypothesis 1b and hypothesis 1c in Java and outside Java. This may be due to the relatively small PAD outside Java (mean = 0.094) compared to PAD in Java (mean = 0.201). According to Gorzelak (2019), based on the results of a study in Poland, differences in performance between regions can also be caused by regional differences from a historical perspective. Drew; Dollery (2016) based on the results of a case study in New South Wales (NSW) suggest that a more detailed classification of local governments is needed because there are many external constraints faced by each local government.

Table 4 | Additional Analysis Results of Regression Hypothesis Testing with Dependent Variables Human Development Index, Long and Healthy Life, Knowledge, Decent Standard of Living with Control Variables Size of Local Government for Local Governments in Java and for Local Governments Outside Java

Variable	Dependent Variable							
	HDI		UPS		PENG		SHL	
	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.
Panel A: Java								
PAD	9.019	0.000[a]	2.015	0.000[a]	2.147	0.000[a]	3.880	0.000[a]
DBH	-4.808	0.000[a]	-1.246	0.000[a]	-0.768	0.011[b]	-1.906	0.000[a]
DAU	-3.693	0.000[a]	-1.389	0.000[a]	-0.862	0.000[a]	-0.826	0.003[a]
DAK	5.452	0.000[a]	0.747	0.000[a]	1.206	0.000[a]	2.465	0.000[a]
SIZE	2.160	0.000[a]	0.523	0.000[a]	0.474	0.000[a]	0.767	0.000[a]
C	8.341	0.111	57.444	0.000[a]	-3.337	0.070[c]	-11.976	0.000[a]
N	357		357		357		357	
R-squared	0.998		0.999		0.994		0.997	
Adjusted R-squared	0.996		0.999		0.992		0.995	
F-statistic	819.357		2043.802		338.937		606.525	
Prob(F-statistic)	0.000[a]		0.000[a]		0.000[a]		0.000[a]	
Panel B: Outside Java								
PAD	-0.116	0.882	0.100	0.743	-0.124	0.607	0.295	0.264
DBH	-3.638	0.000[a]	-1.068	0.000[a]	-1.054	0.000[a]	-0.516	0.000[a]
DAU	-3.166	0.000[a]	-1.072	0.000[a]	-0.932	0.000[a]	-0.343	0.002[a]
DAK	4.594	0.000[a]	0.990	0.000[a]	0.980	0.000[a]	2.011	0.000[a]
SIZE	0.280	0.000[a]	0.036	0.160	0.071	0.000[a]	0.045	0.042[b]
C	59.997	0.000[a]	67.295	0.000[a]	8.592	0.000[a]	7.846	0.000[a]
N	1263		1263		1263		1263	
R-squared	0.998		0.998		0.996		0.998	
Adjusted R-squared	0.997		0.998		0.993		0.997	
F-statistic	859.639		1281.574		436.556		917.862	
Prob(F-statistic)	0.000[a]		0.000[a]		0.000[a]		0.000[a]	

HDI = Human Development Index; UPS = Long and Healthy Life Index; PENG = Knowledge Index; SHL = Decent Standard of Living Index; PAD = Local Original Income; DBH = Profit Sharing Funds; DAU = General Allocation Funds; DAK = Special Allocation Funds (PAD, DBH, DAU, and DAK each divided by the total revenue); Size = Ln Revenue.
a, b, and c are significant at the 1 percent, 5 percent, and 10 percent levels, respectively.

CONCLUSION

This study provides comprehensive empirical evidence on the relationship between local government revenues and human development index in Indonesia. The findings show that PAD and DAK exert positive and significant effects on the HDI and its components—UPS, PENG, and SHL. These results demonstrate that both fiscal independence and targeted transfers directly contribute to improvements in regional human development. Regions with higher PAD and greater access to well-designed earmarked funds consistently achieve stronger outcomes across all HDI components.

In contrast, revenue-sharing funds (DBH) and general allocation funds (DAU) exhibit negative relationships with HDI and its dimensions. These findings indicate that regions more dependent on these transfers experience lower levels of human development and face substantial challenges in translating these financial resources into improvements in welfare, health, and education. The negative coefficients reflect persistent structural disparities across regions, where higher reliance on DAU and DBH is associated with weaker human development performance. Overall, the results confirm the differentiated developmental impacts of various revenue sources and the need to evaluate them separately within decentralized fiscal systems.

The implications of these findings are important for strengthening regional development and the formation of human resources. Enhancing local fiscal independence through more effective PAD collection and management can play a decisive role in accelerating improvements in human development. The consistently positive influence of DAK underscores the strategic value of targeted, program-based transfers, indicating that well-designed earmarked funds in sectors such as education, health, and infrastructure generate more substantial development outcomes than general-purpose transfers. Meanwhile, the negative associations of DAU and DBH with HDI highlight the need to reassess transfer allocation mechanisms, improve accountability in budget execution, and strengthen local government administrative capacity.

In interpreting the results of this study, it is necessary to take into account the limitations of this study. This study only considers aspects of the quantity/amount of PAD, DBH, DAU, and DAK. This study does not consider the quality aspect of using these funds to increase the HDI along with the HDI dimensions. In addition, the real use of each type of local government revenue cannot be clearly

identified. Subsequent studies can use other methods such as qualitative methods with in-depth interviews or direct observation, perception survey methods using questionnaires, or experimental methods. The data used is primary data, namely data from interviews, observations, or questionnaires. Although research with primary data may use a limited scope due to time and cost constraints, the results of such a study can be used to consider aspects of the quality of using PAD, DBH, DAU, and DAK funds in increasing HDI and to test the consistency of the results of this study.

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