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The Effect of Infrastructure Expenditure on Improving the Quality of Human Development in the Western and Eastern Regions of Indonesia

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Abstract:

During the last two decades, HDI as a measure of the quality of human development has undergone changes both in terms of technical and dimensions, one of which is environmental indicators. Previous research has never tested improving the quality of human development that is integrated with economic, social, and environmental dimensions through government expenditure in the public sector. However, this study is still limited to being developed by previous researchers. This research contributes to examining the effect of public sector government expenditure, especially infrastructure expenditure (housing and public facilities functions as well as economic functions) on the quality of human development that integrates the economic, social, and environmental dimensions of AHDH. This study examined the effect of infrastructure expenditure on improving the quality of human development in KBI and KTI both directly and through economic growth and employment absorption. Researchers used the measurement of the quality of human development that integrates economic, social, and environmental dimensions. The researchers used panel data from 33 provinces in Indonesia for the period 2010 – 2020. The data were obtained from the BPS and DJPK, the Directorate General of Pollution Control and Environmental Damage, and the Ministry of Environment, and Forestry of the Republic of Indonesia. The model used is a functional equation model in simultaneous SEM with a reduced form assisted by Rstudio software. The results show that infrastructure expenditure has a positive and significant effect on the quality of human development, either directly or through economic growth, but not significantly through employment absorption. Differences in the quality of human development between KBI and KTI are both from the characteristics of the region and the effect of the variable infrastructure expenditure. The infrastructure expenditure dummy has direct and indirect effects on employment absorption. Furthermore, KTI has a greater influence on the quality of human development than KBI through employment absorption. The implication is that government policies through infrastructure expenditure can reduce the gap in the quality of human development between KBI and KTI. Additionally, expenditure is directed at improving environmental factors, as well as focusing on improving the quality of human development that can be achieved equitably.

Keywords: infrastructure expenditure, quality of human development, economic growth, employment absorption.

基础设施支出对提高印度尼西亚西部和东部地区人类发展质量的影响

摘要:

在过去的二十年里,人类发展指数作为衡量人类发展质量的指标,无论在技术上还是在维度上都发生了变化,环境指标就是其中之一。以前的研究从未测试过通过公共部门的政府支出来提高与经济、社会和环境维度相结合的人类发展质量。然而,这项研究仍然仅限于由以前的研究人员开发。这项研究有助于检查公共部门政府支出,特别是基础设施支出(住房和公共设施功能以及经济功能)对整合增强人类发展指数的经济、社会和环境维度的人类发展质量的影响。本研究考察了基础设施支出对提高印度尼西亚西部地区和印度尼西亚东部地区人类发展质量的直接影响,以及通过经济增长和就业吸收来实现的效果。研究人员使用了综合经济、社会和环境维度的人类发展质量测量方法。研究人员使用了2010年至2020年期间印度尼西亚33个省的面板数据。这些数据来自中央统计局、财政平衡总局、污染控制和环境损害总局以及环境部,以及印度尼西亚共和国林业。使用的模型是联立结构方程模型中的函数方程模型,具有R-工作室软件辅助的简化形式。结果表明,基础设施支出对人类发展质量具有积极和显著的影响,无论是直接还是通过经济增长,但通过吸收就业没有显著影响。印度尼西亚西部地区和印度尼西亚东部地区人类发展质量的差异既来自地区特征,也来自可变基础设施支出的影响。基础设施支出虚拟变量对就业吸收具有直接和间接的影响。此外,印度尼西亚东部地区通过就业吸收对人类发展质量的影响大于印度尼西亚西部地区。这意味着通过基础设施支出的政府政策可以缩小印度尼西亚西部地区和印度尼西亚东部地区之间人类发展质量的差距。此外,支出用于改善环境因素,并侧重于提高可以公平实现的人类发展质量。

关键词: 基础设施支出、人类发展质量、经济增长、就业吸收。

1. Introduction

Infrastructure development stimulates human development (Kusharjanto & Kim, 2011; Sapkota, 2014; Mohanty et al., 2016). Government infrastructure expenditure is generally allocated to build facilities and infrastructure, which are then expected to increase the intensity of economic activity. The increase in economic activity is expected to encourage economic growth, which in turn will improve the quality of human development. Additionally, adequate infrastructure can increase employment absorption, increasing income, which will improve the quality of human development. Mohanty et al. (2016) explained that there is an influence of infrastructure development on human development. In line with that, Vytutas and Simkunaite (2009); Suleiman and Albiman (2014); Faridi et al. (2015); Carvalho et al. (2015) explained that infrastructure is a development locomotive that is indispensable in driving economic growth. Empirical studies also show that infrastructure development is critical to improving the economy of the community in a region (Holtz-Eakin & Schwartz, 1995; Démurger, 2001; Servén & Calderón M., 2004; Fedderke et al., 2006; Estache & Fay, 2009; Maryaningsih et al., 2014; Slesman et al., 2015; Abu Bakar & Che Mat, 2017; Ebuh et al., 2019; Luu et al., 2019; Ouattara & Zhang, 2019; Vålilä, 2020).

The discussion on the role of infrastructure cannot be separated from the ideas of Rosenstein-Rodan (1943) and Hirschman (1957) who emphasized the importance

of capital investment in promoting economic growth. However, it was only since the 1970s (Arrow & Kurz, 1970; Romer, 1986, 1990; Lucas, 1988; and Barro, 1990) that public capital was theoretically modeled in terms of the aggregate production function. The provision of infrastructure facilities will able facilitate the flow of economic cycles, including how to ensure human survival. An empirical study of the impact of infrastructure begins with the writings of Aschauer (1989) who concludes that the marginal productivity of public infrastructure expenditure is two to four times higher than the productivity of private capital. Munnell (1990) and Ford and Poret (1991) also found the large output elasticity of infrastructure, that was further developed by several researchers (Holtz-Eakin & Schwartz, 1995; Démurger, 2001; Servén & Calderón, 2004; Fedderke et al., 2006; Estache & Fay, 2009; Maryaningsih et al., 2014; Slesman et al., 2015; Abu Bakar & Che Mat, 2017; Ebuh et al., 2019; Luu et al., 2019; Ouattara & Zhang, 2019; Vålilä, 2020).

Agenor and Moreno-Dodson (2006) explain that one of the transmission mechanisms through which infrastructure affects economic growth is that infrastructure can have a significant growth effect by facilitating the formation of human resources, especially in developing countries. In contrast to previous studies which were still limited to focus on the impact of infrastructure expenditure on economic growth, this research has a novelty on infrastructure expenditure as a variable that determines the quality of

human development. Additionally, the novelty of this research also lies in measuring the quality of human development, which integrates economic, social, and environmental dimensions. Researchers analyzed the effect of infrastructure expenditure on the quality of human development, either directly or through economic growth and employment absorption. The researchers further analyzed the differences in these influences between the Western Region of Indonesia (KBI) and the Eastern Region of Indonesia (KTI).

Generally, the Human Development Index (HDI) already has a comprehensive approach to analyzing the condition of everyone in society, but there are several problems, both substantial and technical (Desai, 1991; Morse, 2003, 2014; Herrero et al., 2010, 2012; Togtokh et al., 2010; Dervis & Klugman, 2011; Neumayer, 2012; Kovacevic, 2014). Nevertheless, HDI has changed from time to time, with changes in technical calculations and indicators/dimensions (Morse, 2014), one of which is the issue of environmental sustainability, the development of measurement of the quality of human development that integrates economic, social, and environmental dimensions (Ramathan, 1999; de la Vega & Urrutia, 2001; Neumayer, 2001; Morse, 2003; Ray, 2014; Hirai, 2017). Thus, measuring human development requires a holistic measurement approach, particularly considering environmental factors. Environmental sustainability cannot be separated from human well-being and therefore should be included in measures of human well-being (Costanza et al., 1997).

2. Methods and Materials

$$AHDI = \text{Life index}^{(1/4)} \times \text{Education index}^{(1/4)} \times \text{Income index}^{(1/4)} \times \text{Environmental index}^{(1/4)} \quad (1)$$

$$AHDI = \sqrt[4]{\text{Life index} \times \text{Education index} \times \text{Income index} \times \text{Environmental index}} \quad (2)$$

$$AHDI = \frac{\text{Log}(\text{Life index}) \times \text{Log}(\text{Education index}) \times \text{Log}(\text{Income index}) \times \text{Log}(\text{Environmental index})}{4} \quad (3)$$

2.1. Data Collection

This research was conducted in 33 provinces, namely, 17 provinces in KBI and 16 provinces in KTI, excluding North Kalimantan Province, which was newly formed in 2013. The type of data used is secondary data in the form of panel data (pooled data) with a combination of cross-section and time series. For cross-section data, data from 33 provinces are used in KBI and KTI, while for time series, entity data with time/period dimensions in this study use the 2010–2020 period. Data sourced from publication documents issued by the national/provincial Central Statistics Agency (BPS) in the form of the Indonesian Statistics Book, BPS publications in the form of Provinces in Figures 2010–2021, Directorate General of Fiscal Balance (DJPK), Directorate General of Pollution Control and Environmental Damage, Ministry of Environment and Indonesian Forestry and Registration Management Information System (SIMREG) National Development Planning Agency (BAPPENAS). Data collection uses documentation techniques, by tracing

This study used a confirmatory approach that explains the effects of infrastructure expenditure, regional dummy, and infrastructure expenditure dummy on the quality of human development. Infrastructure expenditure is defined as the realization of provincial and regency/municipal expenditure budgets for the function of housing and public facilities and the function of economic expenditure, which is measured in the rupiah. A regional dummy is used to determine the difference between KBI and KTI, where 1 is for KBI and 0 is for KTI. The infrastructure expenditure dummy is the effect dummy for infrastructure expenditure between KBI and KTI, where 1 is for KBI infrastructure expenditure and 0 for KTI infrastructure expenditure. Economic growth is defined as the development of activities in the economy that causes goods and services produced to increase which are used for the prosperity of the community, measured by Gross Domestic Product (GDP) in provincial autonomous regions in KBI and KTI based on constant prices in 2010 within a certain period, with units of the rupiah. Employment absorption is defined as the number of the working population, which is measured in units of person. The quality of human development is defined as a balanced human development with an integrated development paradigm in three dimensions: economic, social, and environmental, proxied by the Advanced Human Development Index (AHDI) developed by Karnitis et al. (2021).

AHDI can be calculated using the following formula:

various data published by national/provincial BPS in the form of Indonesian Statistics Books, BPS publications in the form of Provinces in Figures 2009–2021, Provincial Government Financial Statistics, DJPK, SIMREG BAPPENAS and from ministries, institutions or agencies that provide data related to the variables in this study.

2.2. Data Analysis

The estimation of the magnitude of the direct and indirect effects was carried out by linear regression using Structural Equation Modeling (SEM) with the help of Rstudio software. Thus, the conceptual framework was developed through a functional model, followed by determining the form of a nonlinear function and then transforming it into a linear form that is used to explain the conceptual framework. It was developed with three forms of equations, which are as follows:

$$\text{Ln}Y_{1it} = \text{Ln}\alpha_0 + \alpha_1 \text{Ln}X_{1it} + \alpha_2 \text{Ln}X_{2it} + \alpha_6 X_1 X_{2it} + \mu_{it1} \quad (4)$$

$$\text{Ln}Y_{2it} = \text{Ln}\beta_0 + \beta_1 \text{Ln}Y_{1it} + \beta_2 \text{Ln}X_{1it} + \beta_3 \text{Ln}X_{2it} +$$

$$\beta_4 X_1 X_{2it} \quad (5)$$

$$Y_{3it} = \ln \lambda_0 + \lambda_1 \ln Y_{1it} + \lambda_2 \ln Y_{2it} + \lambda_3 \ln X_{1it} + \lambda_4 \ln X_{2it} + \lambda_8 X_1 X_{2it} \quad (6)$$

where X_1 is infrastructure expenditure; X_2 is the regional dummy where 1 is KBI and 0 is KTI, $X_1 X_2$ is infrastructure expenditure between KBI and KTI; Y_1 is economic growth; Y_2 is employment absorption; Y_3 is human development quality; i is the unit cross-section; t is the period.

3. Results

The researchers first tested the suitability of the model required by the SEM analysis, namely, the absolute fit indices and incremental fit index methods (Hooper et al., 2008). Absolute fit indices determine

how well an apriori model fits the sample data and indicate which model has the best fit. This index provides the most basic indication of how well the proposed theory fits the data. Included in this category are the Chi-Square, RMSEA, GFI, AGFI, RMR, and SRMR tests. The method of incremental fit indices, also known as comparative (Miles & Shevlin, 2007) or relative fit indices (McDonald & Ho, 2002), is a group of indices that do not use the chi-square in its raw form but compare the chi-square value with the baseline model. Included in this category are NFI (TLI) and CFI. Table 1 shows that the goodness of fit index value parameter follows the required standard so that the overall analysis model can be considered fit and there is a match between the model and the data.

Table 1. Model evaluation results (Output of R-studio, created by researchers, 2022)

Test User Model	Cut-Off Value	Output RStudio
Test User Model (Method of Absolute fit indices)		
Test statistic (X^2) <i>Chi-Square</i> (CMIN/DF)	Small	0.00
Root mean square error of approximation:		
RSMEA	< 0.08	0.00
90% confidence interval - lower	< 0.05	0.00
90% confidence interval - upper	< 0.05	0.00
GFI	≥ 0.9	1.00
AGFI	≥ 0.9	1.00
Root mean square residual (RMR)	<0.08	0.00
Standardized Root Mean Square Residual (SRMR)	< 0.08	1.00
Test Baseline Model (Incremental fit indices)		
P-value	< 0.05	0.00
User Model versus Baseline Model		
Comparative Fit Index (CFI)	≥ 0.95	1.00
Tucker-Lewis Index (TLI)	≥ 0.95	1.00

The research findings show that infrastructure expenditure has a positive and significant effect on the quality of human development with a value of 0.998 with a significant value of 0.059 (Table 2). A significant difference in the quality of human development exists between KBI and KTI. Meanwhile, the difference in the effect of infrastructure expenditure

on the quality of human development with an estimated value of -1.549. This shows the large difference in infrastructure expenditure between KBI and KTI on the quality of human development by 1.549%. This means that infrastructure spending on KBI has a smaller effect on the quality of human development with a difference of 3.038% compared to KTI.

Table 2. Estimation result of direct effect of economic growth (Y1), employment absorption (Y2), and quality of human development (Y3) (Output of R-studio, created by researchers, 2022)

Variable		Estimation	Error Standard	t value	Pr(> t)	Description
Exogenous	Endogenous					
Infrastructure Expenditure (X1)	Economic growth (Y1)	1.102	0.061	18.019	0.000**	Significant
Regional dummy (X2)	Economic growth (Y1)	-3.468	2.308	-1.503	0.133	Not significant
Infrastructure expenditure dummy (X1X2)	Economic growth (Y1)	0.146	0.08	1.834	0.067*	Significant
Economic growth (Y1)	Employment Absorption (Y2)	0.623	0.044	14.002	0.000**	Significant
Infrastructure Expenditure (X1)	Employment Absorption (Y2)	-0.11	0.071	-1.546	0.122	Not significant
Region dummy (X2)	Employment Absorption (Y2)	-12.356	1.962	-6.296	0.000**	Significant
Infrastructure expenditure dummy (X1X2)	Employment Absorption (Y2)	0.433	0.068	6.388	0.000**	Significant
Economic growth (Y1)	Quality of human development (Y3)	1.225	0.408	2.998	0.003**	Significant
Employment Absorption (Y2)	Quality of human development (Y3)	-2.068	0.388	-5.325	0.000**	Significant
Infrastructure Expenditure (X1)	Quality of human development (Y3)	0.998	0.53	1.885	0.059*	Significant
Regional dummy (X2)	Quality of human development (Y3)	46.147	15.289	3.018	0.003**	Significant
Infrastructure expenditure dummy (X1X2)	Quality of human development (Y3)	-1.549	0.529	-2.931	0.003**	Significant

Notes: ** significant 1%; * significant 10%

Meanwhile, the indirect effect through economic growth, it was found that infrastructure spending had a

positive and significant effect with an estimated value of 1.35 with $Pr = 0.003$ (Table 3). Furthermore, the absorption of labor has a positive and insignificant effect on the quality of human development. Likewise, it was found that there was no difference in the effect of

the quality of human development between KBI and KTI through economic growth. Alternatively, if the absorption of labor has a different effect, infrastructure spending on KBI has a smaller effect, with a difference of 1,066% compared to KTI.

Table 3. Indirect effects of human development through economic growth and employment absorption (Output of R-studio, created by researchers, 2022)

Variable		Estimation	Error Standard	t value	Pr(> t)	Description
Exogenous	Endogenous					
Infrastructure Expenditure (X1)	quality of human development (Y3) by economic growth (Y1)	1.35	0.456	2.958	0.003**	Significant
Regional dummy (X2)		-4.247	3.162	-1.343	0.179	Not significant
infrastructure expenditure dummy (X1X2)		0.179	0.114	1.564	0.118	Not significant
Infrastructure Expenditure (X1)	Quality of human development (Y3) to Employment Absorption (Y2)	0.228	0.154	1.485	0.138	Not significant
Regional dummy (X2)		25.547	0.283	4.066	0.000**	Significant
infrastructure expenditure dummy (X1X2)		-0.895	0.219	-4.09	0.000**	Significant
Infrastructure Expenditure (X1)	Quality of human development (Y3) by Economic growth (Y1) and Employment Absorption (Y2)	0.685	0.369	1.858	0.063*	Significant
Regional dummy (X2)		-2.157	1.842	-1.171	0.242	Significant
infrastructure expenditure dummy (X1X2)		0.091	0.069	1.309	0.191	Significant

Notes: ** significant 1%; * significant 10%

4. Discussion

4.1. The Effect of Infrastructure Expenditure on the Quality of Human Development, Both Directly and through Economic Growth and Employment Absorption

The results show that infrastructure expenditure has a positive and significant impact on the quality of human development in KBI and KTI. This finding conforms to Kusharjanto and Kim (2011), Sapkota (2014); and Mohanty et al. (2016) explained that infrastructure expenditure is used to provide facilities and infrastructure to encourage human development. The results of this study are also in line with Fattah and Muji (2012), Edeme (2014), and Mohanty and Bhanumurthy (2018) that government expenditure on infrastructure significantly affects HDI.

Indirectly, the findings of this study indicate that infrastructure expenditure has a positive and significant impact on the quality of human development through economic growth. Infrastructure expenditure has a positive and significant impact on economic growth, followed by a positive and significant impact on the quality of human development. Empirically, the increase in infrastructure expenditure has been responded to by positive and rapid economic growth and has also impacted improved the quality of human development. This finding indicates the influence of economic performance on the quality of human development in KBI and KTI. Great economic growth plays a role in encouraging the quality of human development toward a better direction through increasing the education index and the index of people's purchasing power. The contribution of economic performance to human development is mainly through

household activities.

This finding also shows that infrastructure expenditure has a positive and insignificant effect on the quality of human development through employment absorption. Infrastructure expenditure has a negative and insignificant effect on employment absorption, but a decrease in employment absorption can improve the quality of human development. An increase in infrastructure expenditure will reduce employment absorption. This indicates that the allocation of infrastructure expenditure used for developing basic infrastructure and the economic infrastructure that is created is not in sectors that require increased absorption of employment. This is because infrastructure development projects have shifted from employment-intensive to capital-intensive so that the increase in infrastructure expenditure is inversely proportional to the absorption of employment. This means that the greater the expenditure on infrastructure, the greater the human development if the absorption of employment decreases. This situation shows that the increase in infrastructure expenditure has not been responded to by an increase in the quality of human development.

Furthermore, these findings indicate that infrastructure expenditure has a positive and significant impact on the quality of human development through economic growth and employment absorption. This indirect effect shows that the increase in infrastructure expenditure positively contributes to improving the quality of human development through economic growth and employment absorption. These results indicate that an increase in infrastructure expenditure can encourage increased economic growth and employment absorption and the quality of human

development. This indicates that capital-intensive-oriented infrastructure projects encourage positive economic growth and have a positive impact on employment absorption.

4.2. Direct and Indirect Differences in the Quality of Human Development between KBI and KTI, Either Directly or Indirectly through Economic Growth and Employment Absorption

Directly, the research findings indicate that there are differences in characteristics between KBI and KTI on the quality of human development. Basic services are a factor causing the gap between the KBI and KTI regions. Fulfilling access to education, health, housing, drinking water, and sanitation, are basic services that are crucial in improving the quality of life of the Indonesians and have a direct impact on human development. On average for the period 2010 - 2020, the quality of human development processed from BPS data shows that 2 of 16 provinces in KTI, or around 15.38% have scores below the national average (69.48) while in KBI 9 of 17 provinces or 45% who have scores below the national HDI. The level of human development in an area is inseparable from the quality of accessibility to basic services, in this case, educational facilities, health, and economic resources; furthermore, this condition impacts the low productivity of the community.

Indirectly, the findings of this study indicate that there is no difference in characteristics between KBI and KTI on the quality of human development through economic growth. Changes in economic growth that are expected to improve the quality of human development in KBI and KTI have the same value. According to previous findings that economic growth has a positive and significant effect on the quality of human development. This finding conforms to Ranis and Stewart (2005), revealing the importance of a two-way relationship between economic growth and human development so this relationship is mutually reinforcing. The implication is that the government's policy toward improving the quality of human development for KBI and KTI is appropriate through economic growth.

The findings of this study also indicate that there are differences in characteristics between KBI and KTI on the quality of human development through employment absorption, where the effect of employment absorption in KBI is greater than in KTI. Taking into account the effect of absorption of employment as a whole can reduce the quality of human development. Descriptively also illustrates that the absorption of employment in KTI is not followed by an increase in the quality of human development. Alternatively, in KBI, low-employment absorption has a high quality of development. This indicates a different factor of employee productivity. Indonesia is still experiencing

problems related to regional economic disparities, including in terms of employee productivity (Yuniasih et al., 2013). Rahmah and Noorasiah (2012) explained the same thing about regional disparities in employment productivity being an obstacle to increasing national income because they can trigger income distribution disparities. This is the cause the influence of employment absorption in KBI is greater than in KTI.

Furthermore, indirectly, the findings of this study indicate that there is no difference in characteristics between KBI and KTI on the quality of human development through economic growth and employment absorption. This shows that changes in economic growth and employment in KBI and KTI have the same effect on the quality of human development. Referring to the previous results, it is shown that economic growth has a positive and significant effect on the quality of human development, in contrast to employment absorption, which is significant but negative. This indicates that the workforce is not only seen in terms of quantity but how the quality of the workforce, in addition to the level of productivity it has.

4.3. Differences in the Effect of Infrastructure Expenditure on the Quality of Human Development between KBI and KTI, Either Directly or through Economic Growth and Employment Absorption

Directly, the findings of this study indicate a difference in the effect of infrastructure expenditure between KBI and KTI on the quality of human development. The influence of infrastructure expenditure in KTI has a greater value than that in KBI on the quality human development. This finding agrees with Mohanty and Bhanumurthy (2018) that there are large differences between districts in terms of human development achievements.

Indirectly, the research findings show that there is no difference in the effect of infrastructure expenditure between KBI and KTI on the quality of human development through economic growth. The impact of infrastructure expenditure policies in KBI and KTI has the same value on the quality of human development through economic growth. However, the estimation results of infrastructure expenditure on the quality of human development through economic growth have a significant influence. The implication is that the government must encourage economic growth, both in KBI and KTI to improve the quality of human development.

Furthermore, the research findings indirectly indicate a difference in the effect of infrastructure expenditure between KBI and KTI on the quality of human development through employment absorption. The impact of infrastructure expenditure policies in KTI is greater than that in KBI on the quality of human development through employment absorption.

However, the results of the estimation of infrastructure expenditure on the quality of human development through employment absorption have a significant influence. The implication is that government policies in terms of infrastructure expenditure should be more focused on labor-intensive capital expenditures so that government expenditure through increasing employment absorption can encourage improvements in the quality of human development by focusing more on KBI than KTI.

Finally, indirectly, the findings of this study indicate that there is no difference in the effect of infrastructure expenditure between KBI and KTI on the quality of human development through economic growth and employment absorption. The impact of infrastructure expenditure policies in both KBI and KTI has the same value on the quality of human development through economic growth and employment absorption. Infrastructure expenditure in KTI had a greater impact on economic growth than in KBI. However, the results of the estimation of infrastructure expenditure on the quality of human development through economic growth and employment absorption have no significant effect. The implication is that there is a need to evaluate infrastructure expenditure policies at both KBI and KTI to encourage the quality of human development through economic growth and employment absorption.

5. Conclusion

Infrastructure expenditure, which is proxied from the function of expenditure on housing and public facilities and the economic function has a positive and significant direct effect on the quality of human development. This finding conforms to Kusharjanto and Kim (2011), Tachiwou and Hamadou (2011), Fattah and Muji (2012), Sapkota (2014), Edeme (2014), and Mohanty et al. (2016). However, this finding is in contrast to Edeme and Nkalu's (2019) expenditure on energy, expenditure on housing and environmental protection harms human development. This result also differs from that of Herinoto and Zulfanetti (2021) that expenditure on the infrastructure sector has a negative and significant effect on HDI. The indirect effect found a significant effect on the quality of human development through economic growth and employment absorption in KBI and KTI. This indicates that an increase in infrastructure expenditure can improve the quality of human life, in line with Arfiyansyah (2018), Wahyudin and Suhab (2015), and Akinbode et al. (2020) explain that economic expenditure influences economic growth so that it has an impact on the quality of human development.

A difference in the quality of human development exists between KBI and KTI, either directly or through employment absorption, with the estimated KBI being higher than KTI. However, this has no difference regarding economic growth. In contrast to Ranis and Stewart (2005), who explained the importance of a two-way relationship between economic growth and human development. In line with that of Yuniasih et al. (2013),

Rahmah and Noorasiah (2012), explain that regional disparities in labor productivity distribution of income are uneven. Furthermore, there is a difference in the effect of infrastructure expenditure between KBI and KTI on the quality of human development both directly and through employment absorption, where the influence of KTI is greater than KBI, but there is no difference if it is through economic growth. This finding is similar to Mohanty and Bhanumurthy (2018), and Fadilah et al. (2018), which found differences in the achievement of the quality of human development in each region.

Improving the quality of human development thus requires sustainability not only reflected in the availability of employment and income guarantees but how to fulfill the basic rights of every human being to obtain adequate public services. Additionally, it is hoped that the budget allocation in the public sector will be efficient because even though the allocation of expenditure is large and continues to increase, without efficiency it is impossible to have an impact on quality and sustainable development outcomes. Therefore, an in-depth study of the efficiency and effectiveness, as well as the proportion of infrastructure expenditure, is required.

6. Limitations and Further Study

This research only focuses on infrastructure expenditure to examine its effect on the quality of human development in KBI and KTI. Future studies will focus more on or add other types of expenditure such as social protection expenditure, and environmental expenditure, to find out which types of expenditure directly affect the quality of human development. Additionally, determining other variables that can encourage the improvement of the quality of human development such as investment, economic institutions, and others as well as the development of measurement of the quality of human development such as the democracy index and the happiness index.

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