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*Original Article*

# The Effect of Regional Fiscal Capacity Index, Government Expenditure, and Inflation on Human Development in Indonesia

**Said Fachrizal Sasra Ayed [a], Apridar Apridar [a] and Vivi Silvia [a,*]**

[a] Department of Economics, Faculty of Economics and Business, Universitas Syiah Kuala, 23111 Syiah Kuala, Banda Aceh City, Aceh Province, Indonesia; ayedfachrizal@gmail.com (S.F.), apridar@usk.ac.id (A.A.)
* Correspondence: vivisilvia@usk.ac.id (V.S.)

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**Abstract:** Although still below the global average, Indonesia Human Development Index is increasing annually. The HDI of provinces in Indonesia also exhibited an upward trend. Fiscal capacity, government spending, and inflation are subject to continuous fluctuation. Consequently, this study aims to analyze the effects of regional fiscal capacity, government spending, and inflation on Indonesia's Human Development Index in both the short and long terms. Secondary quantitative data were also used in this study. This study employs panel data from the Ministry of Finance and Central Bureau of Statistics, focusing on 33 Indonesian provinces. The data used for this study comprised 594 observations, which were analyzed using the ARDL method. The results indicate that the fiscal capacity variable positively affects the Human Development Index in the short run but has no effect in the long run. The government expenditure variable does not affect the Human Development Index in the short term but exhibits a positive impact in the long term. Conversely, the inflation variable negatively affects the Human Development Index in the short term but positively affects it in the long term. The Indonesian government should implement more intensive policies to improve its HDI. It includes utilizing fiscal space with a budget that prioritizes education, health, and economic improvement and maintaining inflation stability to enhance people's welfare as an indicator of the HDI calculation. Researchers in the same field should consider incorporating additional variables and employing a larger sample size to produce more comprehensive, in-depth research and more precise results regarding the Human Development Index in Indonesia.

**Keywords:** Regional fiscal capacity; Government expenditure; Inflation; Human Development Index.



## 1. Introduction

The development process aims to raise the population's standard of living and create positive changes or additions to the physical, economic, environmental, social, and demographic components. It also creates or expands local or regional employment opportunities and income streams without unduly depleting the available ecological resources (Agbo et al., 2021). The HDI is a socio-demographic variable introduced by the United Nations Development Programme (UNDP) in 1990. It measures three crucial components: having a decent standard of living (Income), acquiring knowledge (Education), and living a long and healthy life (García-Tizón Larroca et al., 2020). Indonesia's HDI score is quite low compared to other nations. Based on UNDP (2021) data, Indonesia is rated fifth in ASEAN, behind Singapore, Brunei Darussalam, Malaysia, and Thailand, and 114th out of 191 countries worldwide.

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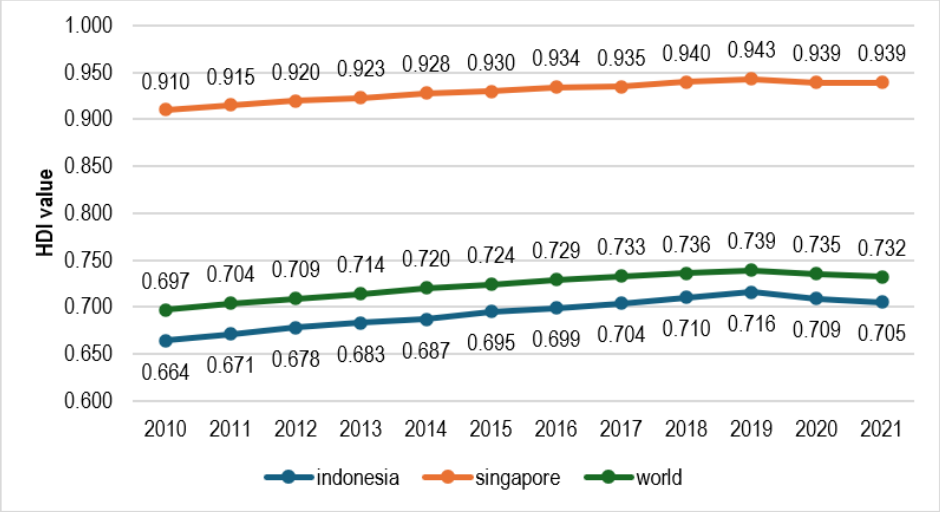


**Figure 1.** Human Development Index Values for Indonesia, Singapore and the World for 2010-2021
Source: United Nations Development Programme (2021)

Figure 1 captures the Human Development Index (HDI) for the world in 2021 is 0.732, a considerable rise from 1990, when it was only 0.601 points, as seen in Figure 1.1. All nations, including Indonesia, saw increased HDI values throughout this time. Indonesia's HDI score increased by 0.179 points to 0.705 in 2021 from 0.526 in 1990 (UNDP, 2021). This suggests that throughout the past 30 years, significant progress has been made in society's welfare in terms of income, health, and education. When we compare Indonesia's HDI rating to Singapore, which has an HDI score of 0.939 in 2021, we can see that it is still much behind the global average. Aside from that, the trend shows that Indonesia's HDI value increased from 2010 to 2019, with the HDI value reaching 0.716 in that year. However, the COVID-19 pandemic caused a fall in Indonesia's HDI value in 2020 and 2021, which in turn caused a slowdown in the increase of life expectancy and education. Additionally, the contraction in economic growth resulted in a decline in real per capita spending (Wicaksono, 2020).

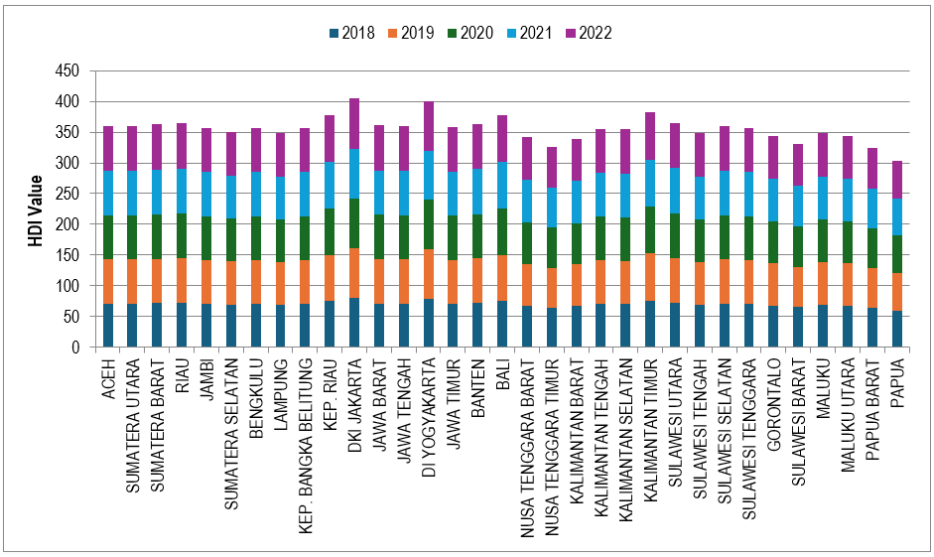


**Figure 2.** Human Development Index Values in 33 Provinces in Indonesia 2018 – 2022
Source: Badan Pusat Statistik (2022)

As illustrated in Figure 2, Papua Province has had the lowest HDI value in Indonesia during the past five years. In contrast, DKI Jakarta Province has had the highest HDI value in the area. Indonesia's Human Development Index (HDI) will be 72.91 points in 2022; province HDI values will be between 61.39 to 81.65 points. The greater the HDI score, the better society is doing in terms of economic, educational, and health-related factors. The province with the greatest HDI value is DKI Jakarta, while the province with the lowest HDI value is Papua Province. Apart from DKI Jakarta, there are only ten other provinces that have HDI values above Indonesia's values, namely the Provinces of West Sumatra, Riau, Riau Islands, West Java, DI Yogyakarta, Banten, Bali, East Kalimantan, and North Sulawesi. These distinctions explain

why this investigation employs research areas up to the provincial level. Several previous studies found that the HDI value is indeed influenced by regional fiscal capacity (Siregar & Pratiwi, 2017; Syam & Chandrarin, 2019; Juma'eh et al. 2020 and Khusaini, 2020). If a region can autonomously supply money deriving from original regional income for sustainable regional development, then the HDI in that region will likewise improve. According to research conducted in the provinces of North Sumatra and Sri Lanka by Sari et al. (2017) and Vijesandiran & Selvarasa (2018), fiscal independence forces the government to prioritize increasing public and capital spending to raise the Human Development Index in the future.

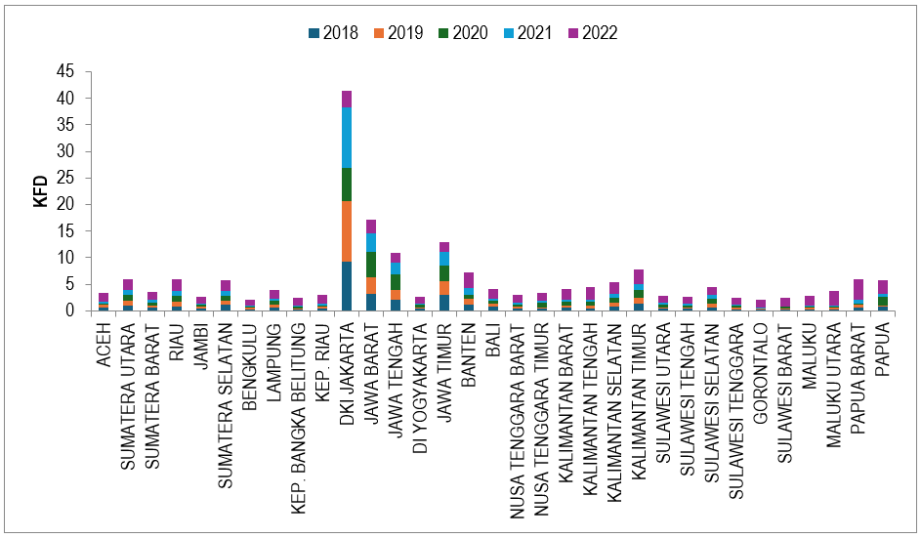


**Figure 3.** Regional Fiscal Capacity Index in 33 Provinces in Indonesia 2018-2022

Source: Ministry of Finance (2022)

Figure 3 captures a substantial regional fiscal competency index variation among the 33 provinces. With a five-year average of 8.26, DKI Jakarta Province has the highest Regional Fiscal Capacity Index score, followed by Gorontalo Province, which has the lowest average value of 0.401. Government spending, especially that on health and education, two components of the HDI cannot be isolated from its influence on shifts in the HDI value, as Haque & Khan (2019) found in Saudi Arabia (Okafor, 2023; Fadilah et al., 2018; Muhammad et al., 2018; Maharda & Aulia, 2020 and Lantion et al., 2023). It would also be easier to achieve high HDI values if government spending is managed prudently and on time. Even if it is simple, if government investment is not done correctly, the aim of increasing human capital will not be achieved (Ho, 2022).

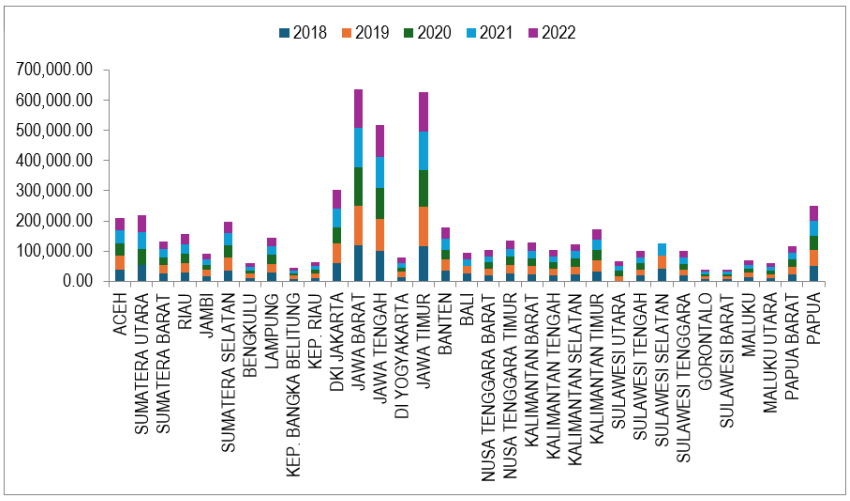


**Figure 4.** Government Expenditures in 33 Provinces in Indonesia 2018-2022

Source: Ministry of Finance (2022)

West Java is the province with the biggest government expenditures, as shown by Figure 4, with a total expenditure of 635,869 trillion rupiah from 2018 to 2022, or an average of 127,174 trillion rupiah. On the other hand, the province of Gorontalo spends the least amount of money overall on government, averaging 7,867 trillion rupiah per

year or 39,329 trillion rupiah from 2018 to 2022. The last variable in our analysis is the inflation rate. According to Osiakwan (2013) and Yolanda (2017), inflation positively and considerably influences the Human Development Index. A high buying power index boosts the HDI score and causes inflation, indicating that people's well-being is also increasing. According to studies done in Nigeria and Indonesia by Ogbebor et al. (2020), Runtunuwu (2020) and Herman (2021), the Human Development Index would decline with each increase in inflation.

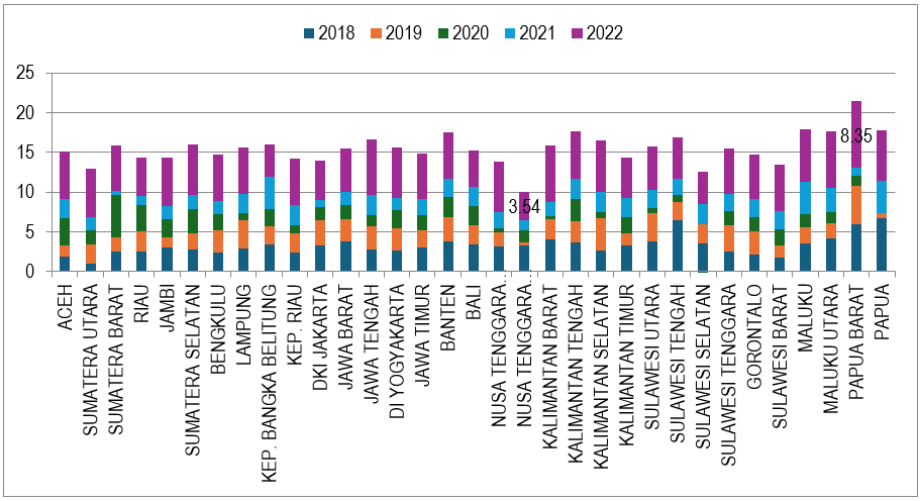


**Figure 5.** Inflation Rates in 33 Provinces in Indonesia 2018-2022

Source: Badan Pusat Statistik (2022)

Figure 5 shows that the rate of inflation differs across all provinces. The provincial capital's inflation rate is used to calculate this inflation rate. Over the past five years, West Papua Province has generally experienced the highest inflation rate. West Papua Province's inflation rate is projected to be 8.35% in 2022. With an inflation rate of 3.54 percent in 2022, East Nusa Tenggara Province has the lowest inflation rate. To explain the Human Development Index in Indonesia from a different, more complex, and detailed perspective, this research uses the three variables mentioned above. It examines their relationship with the index using cointegration (short-term and long-term) with the most recent research period. It is hoped that this research will be more helpful in resolving the Human Development Index issue in Indonesia.

## 2. Materials and Methods

The neoclassical economics paradigm is where the concept of human capital originated. Therefore, to have a clear and thorough knowledge of the neoclassical economic model, we must understand its underlying assumptions about human behavior. This model assumes that individuals wish to maximize their financial interests. Tan (2014) posits that the human capital theory implies individuals should invest in education and training with the expectation of future financial gain. Several variables impact the value of human capital. According to Todaro & Smith (2015), funding for healthcare, workplace training programs, and education contributes to human capital development. Government spending will surely increase human capital, especially in education and health. Another factor influencing the human development index is inflation. According to Blanchard & Johnson (2012), not all prices and incomes increase proportionally during periods of inflation. The capacity to buy goods decreases as prices grow, but wages either do not increase or tend to remain constant, which is one of the elements determining the human development index. It implies that as inflation increases, the HDI will decrease.

Economic and non-economic variables are often included in the analytical components of the Human Development Index Indicator. While economic factors are determined by income, which indicates a person's purchasing power, non-economic variables are determined by public health and education levels (Maulida & Silvia, 2016). Secondary, quantitative data were employed in this study. Panel data, or a combination of time series and cross-sections, is the data employed in this study (Silvia, 2020). Data from 2005 to 2022 make up the time series that was used. The Ministry of Finance and the Central Statistics Agency provided this data. Although there are now 38 provinces in Indonesia, 33 provinces are the subject of this research's investigation due to data accessibility.

Thus, 594 observation data points constitute the entire data set in this study. The ARDL (Auto Regressive Distributed Lag) model, introduced by Pesaran & Smith (1995) and uses panel data, is used in this research to test the short-term and long-term impacts of regional and government fiscal capacity. Expenditure, and inflation factors on the Indonesian Human Development Index. Accordingly, the ARDL model, utilized in earlier studies by Wardhana et al. (2021) and Silvia & Fitra (2023), is the appropriate model to employ in this study. The unit root test, figuring out how

long the lag is in the estimate model, cointegration test, ARDL estimation model, and model stability test are some of the analysis techniques employed. This study aims to ascertain the short- and long-term impacts of regional fiscal capacity, government expenditure, and inflation factors on Indonesia's Human Development Index. The ARDL estimating model is employed to achieve this objective.

## 2.1. Unit Root Test

This test's goal is to ensure that no long-term changes are taking place that can bias the estimation findings. To determine whether the observed data is steady, apply the unit root test. Conclusions using non-stationary variables or variables with unit roots are nonsensical. This is defined by a high R square and statistically significant t values, ultimately leading to incorrect guidance and improper application of regulations. Dickey-Fuller, ADF (Augmented Dickey-Fuller Test), PP (Philip-Perron), and KPSS (Kwiatkowski Philips Schmidt Shin) are a few of the techniques available for doing unit root testing. The PP (Phillips Perron) testing model is the unit root testing model used in this study. The first and second differences can be used if the data is not stationary at the added level. According to (Pesaran & Smith, 1995a), test data is considered static if the PP statistic's absolute value is larger than the critical value. Conversely, the data is not considered static if the PP statistic's absolute value is less than the crucial value. The Phillip-Perron (PP) test can be determined as in equation (1)

$$\Delta Yt = \eta 0 + \eta 1t + \delta \gamma t{-}1 + \upsilon 1, \quad (1)$$

Hypothesis tested:

H0: δ = 0 (contains unit root, data is not stationary)

H1: δ < 0 (does not contain unit root, data is stationary)

## 2.2. Determination of Lag Optima

This test aims to evaluate theories about how many delays the research model should have to give a realistic image of the relationship between the research variables. The ARDL model requires the determination of the lag at which the variable will yield the best estimate. The Schwarz Criterion (SC) and the Akaike Information Criterion (AIC) are used to select the optimal lag in the Auto Regressive Distributed Lag Model. The number of lags is chosen if the magnitude of a lag yields the model's minimum SC and AIC values.

## 2.3. Cointegration Test

To ascertain whether there is a long-term link between variables, the ARDL method cointegration test is conducted. If the regression model is cointegrated, then it is claimed that there is a long-term link. The Bound Test Cointegration approach, which compares the F-statistic value with the F-table created by Pesaran (1997), can be used to determine whether cointegration exists. It may be said that there is no cointegration if the F-statistic value is less than the lower bound value. Cointegration occurs if the F-statistic value exceeds the upper bound value I(1). The results, however, are not convincing if the F-statistic falls between the upper bound I(1) and lower limit I(0). The following is the hypothesis for this F test: There is no long-term connection (not cointegrated); H0 = $\delta_1 = \delta_2 = \delta n = 0$. There is a long-term link (cointegration): $H \neq \delta_1 \neq \delta_2 \neq \theta n \neq 0$. We cannot reject H0 if the F-statistic value is less than the lower limit value, indicating no cointegration. In contrast, reject H0 to allow cointegration if the F-statistic value is greater than the upper limit value. Therefore, it cannot be determined if the F-statistic falls between the lower and higher limit values.

## 2.4. ARDL Panel Model

Referring to the research results of Pesaran & Smith (1995), which were confirmed by Hazmi et al. (2024)**.** Auto Regressive Distributed Lag panel model in this research can be written as follows:

$$\Delta IPM_{i,t} = \alpha_{\square} + \sum_{j=1}^{n} \alpha_0 \Delta IPM_{i,t-1} + + \sum_{j=1}^{n} \alpha_{1i} \Delta RFC_{i,t-1} + \sum_{j=1}^{n} \alpha_{2i} \Delta LOG\_GE_{i,t-1} + \sum_{j=1}^{n} \alpha_{3i} \Delta I_{i,t-1} + \beta_0 lPM_{i,t-1} + \beta_1 KFD_{i,t-1} + \beta_2 LOG\_GE_{i,t-1} + \beta_3 I_{i,t-1} + u_{i,t}, \quad (2)$$

Where, HDI is Human Development Index (dependent variable), RFC is Regional Fiscal Capacity, LOG_G is Government Expenditure Log, I is inflation, $\alpha_1$ to $\alpha_2$ is Short-term coefficient, $\beta_1$ to $\beta_2$ is Long term coefficient, t is Years, namely 2010-2022, i is 33 Provinces in Indonesia, j is a lag sequence, Δ is first difference operator, u is error term. Because the value of each variable uses percentage and point units, it is feared that very large differences in variable values will affect the estimation results. The government expenditure (GE) variable, which uses expenditure

realization data in the Provincial regional income and expenditure budget in rupiah units in this model, will be used as LOG_GE.

# 3. Results

## 3.1. Unit Root Testing

The stationary test aims to ascertain whether the variables have a unit root or, in other words, whether the data are stationary. If the data are not stationary, the regression results will be skewed. When the variables in the model are unrelated to one another, the regression results display a statistically significant regression coefficient and a high coefficient of determination value. This is known as lag-regression. This study's stationarity test employed the Fisher Chi-square - PP (Philip-Perron) method.

**Table 1.** Panel Unit Root PP (Philip-Perron) - Fisher Chi-square

| Variable(s) | Individual Intercept | | Individual Intercept and Trend | |
|---|---|---|---|---|
| | I(0) | I(1) | I(0) | I(1) |
| HDI | 38.607 | 317.309*** | 23.135 | 277.867*** |
| RFC | 47.324 | 385.505*** | 34.164 | 341.153*** |
| GE | 513.620*** | | 90.773** | |
| I | 457.760*** | | 477.961*** | |

Notes: *,**,*** is significant at level 10, 5 and 1 percent.

Table 1 shows that each variable has a distinct stationarity at either the first difference level (I (1)) or the level (I (0)). For instance, the variables regional fiscal capacity (RFC) and human development index (HDI) are stationary at first difference, whereas government expenditure (GE) and inflation (I) are stationary at level. The ARDL panel model satisfies the requirements for usage in this study due to variations in stationarity.

## 3.2. Optimal Lag Length

The next stage in calculating this study model is determining the optimal latency. Lag is used to quantify the amount of time it takes for an influence to generate an IPM reaction. The best lag for the model may be determined using the Schrawrtz-Bayesian Criteria (SBC), Akaike Information Criteria (AIC), or other criteria information with the lowest criterion information value.

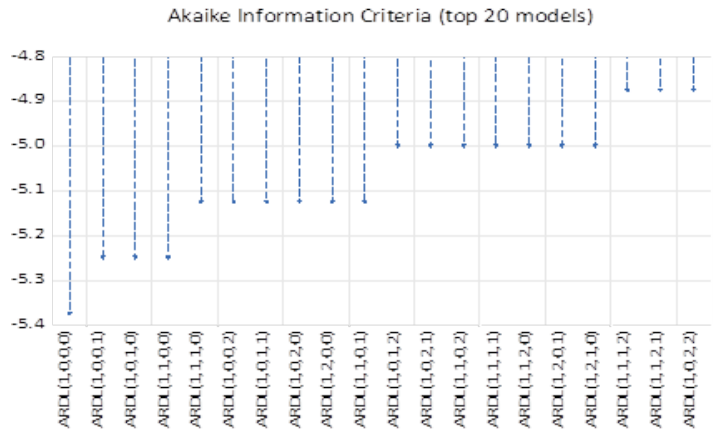


**Figure 6.** Result of Optimal Lag Length

This study uses the Akaike Information Criteria (AIC) value to determine the ideal latency. The ARDL Panel, which yields the best model in this study, is the lag chosen by examining the AIC criterion, which is 1.1.1.1. The independent variable regressor employs a lag of 0, thus it cannot be estimated in the near term. 1.1.1.1 is the best lag that can be utilized in this research, even though this lag is not the minimum AIC value that can be picked (see Figure 6).

### 3.3. Cointegration Test

A cointegration test on the model is the next step. Finding out if non-stationary variables are cointegrated or not is the goal of the cointegration test.

**Table 2.** Result of Cointegration Test

| Pedroni Cointegration Test | Statistics | Weighted Statistics |
|---|---|---|
| v-Statistics panel | 0.522 (0.301) | -1.328 (0.908) |
| rho-Statistics panel | -5,148 (0.000) | -4.553 (0.996) |
| PP-Statistics Panel | -20,082 (0.000) | -17,542 (0.000) |
| ADF-Statistics Panel | -6,770 (0.000) | -6,249 (0.000) |
| Group rho-Statistics | -2,749 (0.003) | |
| Group PP-Statistics | -24,005 (0.000) | |
| Group ADF-Statistics | -7,215 (0.000) | |
| KAO Cointegration Test | t-statistic | |
| ADF | -10,502 (0.000) | |

To identify several integrated variables in distinct orders, I(0) or I(1), the panel cointegration test with Pedroni and KAO-based is used in this study. It can be inferred from Table 2 that there is a short- to long-term link between the four variables since the cointegration panel test findings between HDI, RFC, GE, I, and C are significant at the 5 percent and 1 percent levels.

### 3.4. Estimation of the ARDL Model

The findings of the ARDL panel regression satisfy the criteria due to the substantial and negative slope of the Error Correction Term coefficient. As seen in Table 3, this model satisfies the requirements and may be used to analyze the impact of inflation, government expenditure, and regional fiscal capability on Indonesia's Human Development Index.

**Table 3.** Result of Panel Regression

| Estimate | Variable | Coefficient | t-Statistics | Prob. |
|---|---|---|---|---|
| Long-term | RFC | -0.038548 | -0.114368 | 0.9090 |
| | LOG_GE | 8.258709 | 7.073297 | 0.0000 * |
| | INF | 0.298482 | 2.946115 | 0.0034 * |
| | C | 38.25391 | 8.682750 | 0.0000 * |
| Short-term | ∆RFC | 0.509109 | 5.223678 | 0.0000 * |
| | ∆LOG_GE | 1.267476 | 1.260359 | 0.2081 |
| | ∆INF | -0.126049 | -7.220638 | 0.0000 * |
| | ECT (-1) | -0.191779 | -8.591977 | 0.0000 * |

Notes: * and ** significance levels 1%, and 5%

Determining how quickly the short-term balance is adjusted in favor of the long-term is one of the ECT-1 coefficient's other functions. The ECT-1 coefficient in the ARDL panel regression in the above table is -0.191779. This coefficient value indicates that corrections or adjustments to the imbalance (disequilibrium) in the Human Development Index variable itself will be carried out immediately at 19 percent each period if there is a difference between the desired results and those that occur or if there is an error disturbance that increases or decreases the index by 1 percent. The T-test was used to conduct a hypothesis test like the following test. According to the first hypothesis of this study, government expenditure and regional fiscal capacity have a positive short-term impact on Indonesia's Human Development Index, whereas inflation has a negative one. The ARDL panel is used to test this hypothesis, and the findings are shown in Table 3. At the one percent significance level, it is proven that fiscal capacity positively affects the Human Development Index, with a probability value of 0.000<0.005 and a positive coefficient. This suggests that the hypothesis H0 is rejected. Government spending has no short-term impact on HDI, as indicated by the probability value of 0.208>0.005 for the government expenditure variable, indicating that H0 is accepted. The probability value of the inflation variable, which is the final variable to be tested, is 0.000<00.5 with a negative coefficient value, indicating that H0 is rejected, and that inflation has a short-term negative impact on HDI.

The second hypothesis of this study is that, over time, inflation hurts Indonesia's Human Development Index whereas regional fiscal capacity and government expenditure have a favorable impact. The fiscal capacity variable has

a probability of 0.909>0.05, indicating that H0 is accepted, and that fiscal capacity has no long-term influence on HDI, according to the findings of the T-test. The government spending variable is the next one to be evaluated. It has a probability value of 0.000<0.005 and a negative coefficient value, indicating that government expenditure would eventually positively impact HDI. The final variable examined was inflation, which has a long-term beneficial impact on HDI with a probability value of 0.003<0.05 and a positive coefficient.

## 4. Discussion

With a coefficient value of 0.509, fiscal capacity has a short-term positive and considerable impact on Indonesia's development index. This indicates that for every one-point rise in the fiscal capacity ratio, 0.509 HDI points would be gained. The findings of this study are consistent with research by Sari & Riharjo (2020), Siregar & Pratiwi (2017) and Khusaini (2020), who demonstrate that precise and careful management of regional fiscal capacity coupled with effective and efficient budget management will significantly increase human development. Tümay (2021)and Jin & Jakovljevic (2023) also found similar results to previous stu conducted in 50 countries. While there is a short-term positive correlation between fiscal capacity and the Human Development Index (HDI), this relationship breaks down over time because estimates of fiscal capacity's long-term impacts on the HDI in Indonesia are predicated on this supposition. This implies that the monies allotted to each province are only momentarily used to further human growth. The results of this study agree with the findings published by Sari & Riharjo (2020) and Handayani et al. (2023). Ineffective fiscal capacity management will hinder the optimal implementation of essential development for community welfare (Handayani et al., 2023).

Government expenditure has little effect on Indonesia's short-term Human Development Index. This demonstrates that government investment in every Indonesian province promotes an increase in the Human Development Index despite the effect being negligible or nonexistent. Riana & Khafid (2022), Annisa & Indraswanti (2024) and Okeke (2017) have carried out comparable studies in Nigeria. Even though education is one of the key components of the Human Development Index, these researchers found that government spending on education did not influence the index. This result supports the claim made by Ho (2022) that obtaining a high HDI value will be simpler if government expenditure is properly controlled and on target. If government spending is not done as effectively as possible, increasing human capital will not be feasible. On the other hand, over time, government spending has had a substantial and favorable impact on the Human Development Index. This conclusion is consistent with earlier study findings by Fadilah et al. (2018) which demonstrate that government expenditure on the economy, health care, and education significantly improves each factor of the East Java Province's Human Development Index. Government spending was a significant contributor to Saudi Arabia's Human Development Index growth between 1990 and 2016, according to Haque & Khan (2019) conclusions, which were also supported by Shenai & Montenegro (2019), Herianingrum et al., (2019), and Manullang et al. (2024).

According to Masduki et al. (2022), the constructs of priority, allocation, time, accountability, and effectiveness support the quality of government spending. This means that when government spending is viewed through these five constructs, it can be considered quality and has the potential to raise the Human Development Index. According to short-term estimation results, inflation significantly and negatively impacts the human development index. These findings suggest that any short-term decrease in the Human Development Index will arise from increased inflation. The empirical findings of Osiakwan (2013), Ogbebor et al. (2020), Koyuncu & Yalcinkaya (2022), Sumiyarti et al. (2022), Annisa (2022), Gabriel Osakwe Ikediashi et al. (2023) and Afolabi Azeez (2024) are consistent with the findings of this study. A rise in inflation reflects rising costs for products and services over an extended period, which lowers the currency's value for various reasons. Purchasing power parity (PPP) is an indicator used to construct the Human Development Index, causes people's buying power to decline concurrently with rising prices for goods and services. As a result, rising inflation automatically lowers the HDI score.

However, as this research and earlier studies by Yolanda (2017) and Islam (2022) show, rising inflation will eventually raise the Human Development Index due to the government's emphasis on improvements in the health and education sectors, which will also influence rising people's income. Depending on how severe the inflation is, Runtunuwu (2020) claims that it might have both good and bad effects on the economy. A modest rate of inflation (less than ten percent) will boost national income and encourage saving, investing, and working, which will benefit the economy. However, if the inflation that happens is not reined in, the economy will become chaotic and sluggish, which would naturally lower the standard of social welfare.

## 5. Conclusions

This study concludes that ARDL panel regression results fulfill the condition because the coefficient of the error correction term is sloped negative and significant with a mark ECT coefficient of -0.191779, which means the speed adjustment balance period is shortly going to period long by 19 percent in each period. Variable capacity fiscal influential is positive and significant to the Human Development Index in the short term. However, there is no significant in the

long term. Variable expenditure government No influence on the Human Development Index in the term, but influential positive significant in the long term. Variable inflation has an influential negative significance to the Human Development Index in the short term and vice versa, with influential positive significance in the long term.

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