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Digital Transformation: HDI, Consumption, And Inclusive Economic Growth Link

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Abstract

This research investigates the impact of digital transformation on inclusive economic growth in Indonesia, in light of significant social and economic inequality. While previous studies, particularly in South Africa, have highlighted opportunities for market access, this study focuses on identifying the factors that influence the contribution of digital transformation within the Indonesian context, using Prakash's theory. A quantitative descriptive approach was employed, utilizing secondary data from the Central Statistics Agency across ten provinces in Sumatra. The analysis applied the Panel Vector Autoregressive (PVAR) method to examine the relationships among variables, including the Human Development Index (HDI), consumption, and social inequality. The findings indicate that, in the long term, both consumption and HDI have a negative impact on inclusive economic growth, with t-statistics of -2.452 and -5.093, respectively. Inequality, however, did not show a significant influence, with a t-statistic of 1.148. Similar trends were observed in the short term. The study concludes that a nuanced understanding of the equitable implementation of digital technology is essential for achieving inclusive economic growth. Notably, the negative influence of HDI on economic inclusion suggests that improvements in quality of life do not always correlate directly with economic growth, offering new insights into the discourse on digital transformation and economic inclusion in Indonesia.

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INTRODUCTION

In the era of increasing globalization, digital transformation has become a major driving force influencing various aspects of life, particularly in the economic context (Feroz et al., 2021). Digital transformation refers to using digital technology to enhance operational efficiency, innovation, and competitiveness across various sectors (Berawi et al., 2020). According to Yur'ev (2020), the adoption of digital technology has the potential to improve organizational efficiency and effectiveness, as well as expand market access for diverse community groups. Digital transformation's impact is not always evenly distributed and may contribute to social and economic inequality if not properly managed (Ren et al., 2025).

The Human Development Index (HDI) is an important indicator reflecting community welfare and quality of life (Dasic et al., 2020). A report by the Central Statistics Agency (2021) indicates that although Indonesia has experienced significant economic growth, the growth in HDI has not been proportional, suggesting a gap in the welfare distribution. Aysa (2021) observed that digital transformation can improve HDI through enhanced access to education, healthcare, and employment opportunities (Dasic et al., 2020). However, without appropriate supporting policies, these benefits may not be equitably distributed across all segments of society (Morin et al., 2025).

Changes in consumption patterns driven by digital transformation also significantly influence inclusive economic growth (Zuo & Yu, 2024). Digitalization has improved access to goods and services through e-commerce platforms and mobile applications, enabling consumers to conduct transactions more efficiently (Li et al., 2023). Nonetheless, not all community groups have equal access to technology, and digitally marginalized consumers may not experience the same benefits (Priyadharma, 2024). This situation may exacerbate social and economic inequality, as certain groups gain better access to opportunities than others (Hagar et al., 2024).

One key challenge developing countries such as Indonesia faces is ensuring that digital transformation supports inclusive economic growth. Tuti et al. (2021) underscore that uneven adoption of digital technology can create disparities in access to education, healthcare services, and other economic opportunities. Research by Muhammaditya et al. (2021) highlights the importance of policies oriented toward social inclusion to ensure that digital technology does not exacerbate inequality but instead serves to reduce such gaps.

Research by Manda & Backhouse (2017) demonstrates that in South Africa, digital transformation has become one of the primary strategies adopted by the government to promote inclusive growth. Meanwhile, based on country-specific analyses, Tudose et al. (2023) emphasize the importance of evaluating the impact of digital transformation on economic and social outcomes using econometric methods. Kwilinski et al. (2023) conducted a study covering nearly 200 countries over 25 years, including many developing nations that are often overlooked. Their index tracks progress toward building an inclusive and environmentally sustainable modern economy and serves as a valuable tool for policymakers and analysts. Given the existing body of research, this study was conducted in Indonesia using data from ten provinces and employing different variables. The debate surrounding the effects of digital transformation on inclusive economic growth—whether positive or negative—continues, indicating the necessity for further investigation in this context.

This study examines the linkages between digital technology adoption, the Human Development Index (HDI), and inclusive economic growth. It explores how digital transformation can enhance HDI and generate new consumption patterns that support economic growth, while addressing the challenges associated with social inequality.

The research focuses on the complex interactions among digital transformation, HDI, consumption patterns, and inclusive economic growth. The primary issue concerns how implementing digital technology can positively

influence HDI and consumption and contribute to inclusive economic development. Additionally, the study identifies potential social and economic disparities that may arise from digital transformation, particularly among marginalized groups.

Based on the identified problems, this study formulates several hypotheses: H1: There is a positive relationship between the adoption of digital technology and the increase in the Human Development Index (HDI) in Indonesia. H2: Digital transformation contributes to a more efficient change in consumption patterns, creating inclusive economic growth opportunities. H3: Inequality in adopting digital technologies exacerbates social and economic inequalities. H4: Policies that support digital inclusion will reduce social and economic disparities by ensuring equitable access to technology and knowledge across all society.

RESEARCH METHODS

The study employed a quantitative descriptive method using the Vector Autoregression (VAR) approach. Integrating vector autoregression tree models with Bayesian additive regression improved forecasting accuracy and allowed for stochastic volatility in the error terms (Rossinib, 2021). The general form of the VAR model treats all variables as endogenous. This formulation describes the VAR model with *n* endogenous variables (Widarjono, 2018).

$$Ynt = \beta 01 + \beta in\ p\ i{=}1\ Y1t{-}i + ain\ p\ i{=}1\ Y2t{-}i + \ldots\ldots + \eta in\ p\ {-}{=}1\ Ynt{-}i + ent \quad \ldots\ldots\ldots\ldots (1)$$

Where Ynt represents the vector elements of GDP, CONS, HDI, and KSE. Meanwhile, β01 is the constant vector. βi2, and Yit−1Y are the coefficients of Ynt−1Y, and ppp is the lag length. ete_tet is the vector of shocks to each Variable. Therefore, the VAR model that will be used for estimation can be expressed as follows:

$$GDP_{it}=\alpha_0+\sum_J^n \beta_{1j}\Delta HDI_{,t\text{-}j} + \sum_J^n \beta_{2j}\Delta CONS_{i,t\text{-}j} + \sum_J^n \beta_{3j}\Delta\ KSE_{i,t\text{-}j} + \mathcal{E} \quad \ldots\ldots\ldots\ldots (2)$$

$$HDI_{it}=\alpha_0+\sum_J^n \beta_{1j}\Delta\ CONS_{,t\text{-}j}+\sum_J^n \beta_{2j}\Delta\ KSE_{\ i,t\text{-}j} + \sum_J^n \beta_{3j}\Delta\ GDP_{i,t\text{-}j} + \mathcal{E} \quad \ldots\ldots\ldots\ldots (3)$$

$$CONS_{it}=\alpha_0+\sum_J^n \beta_{1j}\Delta\ KSE_{,t\text{-}j}+\sum_J^n \beta_{2j}\Delta\ GDP_{i,t\text{-}j} + \sum_J^n \beta_{3j}\Delta\ HDI_{i,t\text{-}j} + \mathcal{E} \quad \ldots\ldots\ldots\ldots (4)$$

$$KSE_{it}=\alpha_0+\sum_J^n \beta_{1j}\Delta\ GDP_{t\text{-}j} + \sum_J^n \beta_{1j}\Delta\ HDI_{i,t\text{-}j} + \sum_J^n \beta_{1j}\Delta\ CONS_{i,t\text{-}j} + \mathcal{E} \quad \ldots\ldots\ldots\ldots (5)$$

Where GDP_{it} is Variable of inclusive economic growth first difference; HDI_{it} is Variable of the Human Development Index first difference; $CONS_{it}$ is Variable Consumption level first difference; KSE_{it} is Variable Social and economic inequality first difference; i is represent 10 Provinces; t is Year; β is the Constant; and ε is the Stochastic error term.

RESULTS AND DISCUSSION

Panel data combines cross-sectional and time series data, with each cross-sectional unit observed over multiple time periods. A stationarity test on the time series data is necessary in VAR panel modeling.

Table 1. Stationary Test Results

Variable	Unit Root Variables Test (Level 0)			
	ADF Value	MacKinnon Critical Value		Description
		5%	p-value	
GDP	-0,69430	0,05	0,0000	Statistics on Oder 0
HDI	-0,20131	0,05	0,4202	Unstable on Oder 0
CONS	-7,92126	0,05	0,0000	Statistics on Oder 0
KSE	-4,50296	0,05	0,0000	Statistics on Oder 0
Degree Integration Test (First Difference)				
D(HDI)	-3,85521	0,05	0,0001	Stationary on Oder 1

This can be observed at order 0 (level), where the p-value for each Variable exceeds α = 5%. This indicates acceptance of the null hypothesis (H_0), meaning the presence of a unit root or non-stationary data. As a result, the data requires differencing to achieve stationarity. After differencing, all variables are found to be of order I (first differences), as indicated by p-values for each Variable falling below α = 5%, thereby rejecting the null hypothesis and confirming that the data are stationary.

The estimation of the VAR model begins with determining the appropriate lag length. Selecting the optimal lag length is essential in VAR modeling. If the lag length is too short, it may fail to capture the complete dynamics of the model. Conversely, an excessively long lag length may result in inefficient estimation due to reduced degrees of freedom (Basuki, 2016).

Table 2. Optimal Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-419,5031	NA	0,3598170	10,329340	10,446740	10,376480
1	-330,3507	167,4325	0,0604610	8,545140	9,132145*	8,780814*
2	-318,1224	21,77249	0,0664820	8,637131	9,693739	9,061343
3	-300,3402	29,92604	0,0641160	8,593664	10,119880	9,206415
4	-274,0935	41,61059	0,0506220	8,343745	10,339560	9,145035
5	-259,7652	21,31773	0,0539150	8,384518	10,849940	9,374346
6	-229,2735	42,39101*	0,0391500	8,031060	10,966080	9,209427
7	-209,4412	25,63688	0,0373940	7,937589	11,342220	9,304495
8	-189,5135	23,81596	0,036269*	7,841793*	11,716020	9,397238

Source: Processed Secondary Data (2024)
Note: *indicates lag order selected by the criterion

Lag 8 has the lowest values for the Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ). This indicates that the optimal influence among variables occurs over a time horizon of eight periods. Therefore, lag 8 estimates the Vector Error Correction Model (VECM) parameters.

The Panel Vector Error Correction Model (P-VECM) is applied to examine the variables used in the study through two parameter estimates: the long-term equilibrium relationship parameter and the short-term relationship parameter. In this analysis, lag 8 is employed based on the selected lag length criteria.

Table 3. Long-Term and Short-Term Relationships

Cointegrating Eq:	CointEq1
GDP(-1)	1,000000
CONS(-1)	0,105727
	(0,03528)
	[2,99656]
HDI(-1)	0,556326
	(0,0766)
	[7,26261]
KSE(-1)	1,562206

	(4,39863)			
	[0,35516]			
c	-50,02577			
Error Correction:	**D(GDP)**	**D(CONS)**	**D(HDI)**	**D(KSE)**
CointEq1	-1,039329	-0,888577	-0,941910	0,002092
	(0,20816)	(0,36237)	(0,18493)	(0,00182)
	[-4,99303]	[-2,45212]	[-5,09346]	[1,14847]
D(GDP(-1))	0,159225	0,580809	0,716298	-0,000866
	(0,16201)	(0,28204)	(0,14393)	(0,00142)
	[0,98281]	[2,05932]	[4,97671]	[-0,61080]
D(GDP(-2))	0,072958	0,511793	0,352727	0,000238
	(0,11929)	(0,20766)	(0,10598)	(0,00104)
	[0,61162]	[2.46453]	[3,32840]	[0,22798]
D(CONSI(-1))	0,172712	-0,285172	-0,078974	-0,001032
	(0,05920)	(0,10306)	(0,05259)	(0,00052)
	[2,91750]	[-2,76714]	[-1,50163]	[-1,99261]
D(CONSI(-2))	0,095926	-0,166457	-0,031736	0,000192
	(0,06041)	(0,10516)	(0,05366)	(0,00053)
	[1,58804]	[-1,58294]	[-0,59138]	[0,36266]
D(HDI(-1))	0,241617	0,256820	-0,010864	0,000816
	(0,13018)	(0,22663)	(0,11565)	(0,00114)
	[1.85599]	[1,13322]	[-0,09394]	[0,71585]
D(HDI(-2))	-0,054603	-0,042010	0,010510	-0,000495
	(0,11767)	(0,20484)	(0,10454)	(0,00103)
	[-0,46405]	[-0,20509]	[0,10054]	[0,48020]
D(HDI(-1))	27,2726	17,39369	-11,58955	-0,149972
	(13,3464)	(23,2343)	(11,8569)	(0,11682)
	[2,04343]	[0,74862]	[-0,97745]	[-1,28383]
D(HDI(-2))	-2,350644	58,7521	-4,219062	-0,205669
	(13,0175)	(22,6616)	(11,5647)	(0,11394)
	[-0,18058]	[2,59258]	[-0,36482]	[-1,80513]
C	0,018294	-0,006876	-0,018078	-0,001459
	(0,21800)	(0,37951)	(0,19367)	(0,00191)
	[0,08392]	[-0,01812]	[0,09334]	[-0,76478]
R-squared	0,475260	0,297117	0,386470	0,172000
Adj. R-squared	0,413867	0,214962	0,314759	0,075221
Sum sq. Resids	313,542000	950,221000	247,462700	0,024020
S.E. equation	2,017913	3,512909	1,792708	0,017662
F-statistic	7,747145	3,616536	5,389246	1,777246
Log likelihood	-179,215700	-227,446900	-168,920500	233,025700
Akaike AIC	4,349787	5,458549	4,113114	-5,127029
Schwarz 5C	4,633225	5,741986	4,396552	-4,843591
Mean dependent	0,002299	-0,061034	0,031379	-0,001092
S.D. dependent	2,635751	3,964803	2,165647	0,018366

Determinant resid covariance (dof adj.)	0,038789
Determinant resid covariance	0,023801
Log likelihood	-331,1859
Akaike information criterion	8,624964
Schwarz criterion	9,872090

Source: Data Processed, 2024

Based on Table 3, the long-term relationship shows a negative and significant influence of consumption on inclusive economic growth (-2.452 > 1.96). Similarly, in the long term, the Human Development Index (HDI) also has a negative and significant influence on inclusive economic growth (-5.093 > 1.96). In contrast, inequality does not have a significant long-term effect on inclusive economic growth (1.148 < 1.96). The analysis of the long-term relationship between consumption, HDI, and social and economic inequality on inclusive economic growth indicates that both consumption and HDI exert a negative and significant influence on inclusive economic growth. The t-statistic for consumption is -2.452, which exceeds the critical value of 1.96, indicating that an increase in consumption is not always directly proportional to the growth of inclusive economic growth (Ariutama & Syahrul, 2017; Dhiya & Negara, 2024). This outcome may be attributed to factors such as the unequal distribution of income, which causes most consumption to contribute minimally to overall economic growth (Caous & Huarng, 2020).

Likewise, HDI has a negative and significant effect on inclusive economic growth, with a t-statistic of -5.093. Although HDI is an essential indicator for measuring quality of life and human development, in this context, an increase in HDI does not necessarily lead to an increase in inclusive economic growth (Simarmata & Iskandar, 2022). This condition may reflect a misalignment between improvements in quality of life and sustainable economic growth, where corresponding increases do not match gains in HDI in economic productivity (Amponsah et al., 2023).

Meanwhile, social and economic inequality does not significantly influence inclusive economic growth, as indicated by the t-statistic value of 1.148, which is less than 1.96. This suggests that although inequality remains a critical issue in economic development, it does not consistently influence inclusive economic growth over the long term (Yanuar, 2017). Lukito (2022) states that high inequality can obstruct economic growth if left unaddressed. However, in this case, the impact does not appear substantial enough to directly affect inclusive economic growth (Ahmad et al, 2021).

In this context, digital transformation serves as a key driver of inclusive economic growth in Indonesia. By leveraging digital technology, the government and the private sector create new opportunities for society, particularly for those in the lower economic strata (Rosmayati & Maulana, 2024). Digital transformation expands access to information, education, and financial services, increasing productivity and generating new employment opportunities (Goulart et al., 2022).

Moreover, digitalization reduces inequality by broadening access to economic resources and opportunities. For instance, micro, small, and medium enterprises (MSMEs) utilize digital platforms to reach wider markets, raise income levels, and support inclusive economic growth (Yolanda, 2024). According to Agit (2024), digital transformation enhances economic efficiency and promotes more inclusive and sustainable growth. Despite the negative influence of consumption and HDI on inclusive economic growth and the lack of significant impact from inequality, digital transformation offers an effective approach to supporting inclusive economic growth in Indonesia. Using technology and innovation, Indonesia addresses current challenges and builds a more equitable future for all segments of society (David et al., 2025).

Collaboration among the government, private sector, and civil society remains essential to reinforce inclusive economic growth. The

private sector contributes by providing technology and innovation, while the government formulates regulatory frameworks that support a conducive environment (Ananda et al., 2024). Civil society plays a critical role in policymaking to ensure that the resulting policies reflect public needs and aspirations. Through the adoption of digital transformation, Indonesia holds the potential to realize more inclusive and sustainable economic growth (Yulia & Supriatna, 2024). Nevertheless, challenges such as the digital divide require attention to ensure that all segments of society benefit from these developments (Vassilakopoulou & Hustad, 2023).

Based on Table 3, in the short-term relationship, consumption has a negative and significant influence on inclusive economic growth, with a t-statistic of -2.059, greater than the t-table value of 1.96. Similarly, HDI has a negative and significant influence on inclusive economic growth, with a t-statistic of -4.976. In contrast, inequality does not significantly affect inclusive economic growth in the short term, as indicated by a t-statistic of -0.610, which is smaller than 1.96.

Furthermore, HDI continues to show a negative and significant influence on inclusive economic growth with a t-statistic of -4.976. Although HDI serves as an important indicator for measuring quality of life, in the short term, an increase in HDI does not always correspond to an increase in inclusive economic growth (Muhamad & Rahmi, 2023). This may occur because improvements in quality of life are not accompanied by corresponding increases in economic productivity, making inclusive economic growth unable to match the pace of HDI improvement (Sharma, 2021).

On the other hand, social and economic inequality does not significantly influence inclusive economic growth, as shown by a t-statistic of -0.610, below 1.96. This indicates that in the short term, inequality does not have a significant direct impact on inclusive economic growth. Although inequality remains a serious issue in economic development, in this context, its impact does not appear strong enough to influence economic growth directly (Anwar, 2022).

In this context, digital transformation presents a potential solution for promoting inclusive economic growth in Indonesia. By adopting digital technology, the government and private sector create new opportunities that can be accessed by all levels of society (Fu et al., 2021). Digital transformation improves access to information, education, and financial services, which are critical for enhancing productivity and generating employment (Bahasoan et al., 2024).

Digitalization can also help reduce inequality by giving people wider access to economic resources and opportunities (Bonina et al., 2021). Through digital platforms, individuals and businesses—especially micro, small, and medium enterprises (MSMEs)—can reach broader markets, increase revenue, and contribute to inclusive economic growth (Seele & Lock, 2017; Oloyede et al., 2023). Thus, digital transformation holds the potential to enhance economic efficiency and foster more inclusive and sustainable growth (Rashid, 2019). Overall, despite the negative influence of consumption and HDI on inclusive economic growth and the absence of significant effects from inequality, digital transformation can be an effective tool to promote inclusive economic growth in Indonesia (Liu et al., 2021). By leveraging technology and innovation, Indonesia can address current challenges and create a better future for all segments of society (Shen et al., 2021). Digital transformation can become a key driver in building a more equitable and sustainable economic ecosystem, enabling all parties to benefit from the resulting growth (Lubis & Nasution, 2023).

Based on Table 3, inclusive economic growth has a positive and significant influence on consumption in the short term, as indicated by a t-statistic of 2.917, which is greater than the t-table value of 1.96. Meanwhile, HDI has no significant influence on consumption in the short term, with a t-statistic of -1.501, which is less than 1.96. Furthermore, inequality has a negative and significant influence on consumption in the short term, with a t-statistic of -1.992, which exceeds 1.96 in absolute value.

In analyzing the short-term relationship between inclusive economic growth, HDI, and

social inequality on consumption, the results demonstrate that inclusive economic growth has a positive and significant effect on consumption. A t-statistic of 2.917, greater than the t-table value, suggests that rising inclusive economic growth contributes to increased public consumption. As the economy grows, people's incomes tend to rise, encouraging higher spending on consumption (Permata et al., 2024). Robust economic growth can generate employment and enhance purchasing power, enabling individuals to meet their needs and improve their living standards.

However, in the same analysis, HDI did not significantly affect consumption, with a t-statistic of -1.501, smaller than 1.96. This indicates that, in the short term, improvements in quality of life as measured by HDI do not directly contribute to increased consumption. Although HDI includes important dimensions such as education and health, these factors may not immediately influence consumption patterns. It is possible that the effects of increasing HDI require time to be reflected in consumption behavior, or that other more immediate factors, such as current economic conditions, exert a stronger influence on consumption decisions (Maulida, 2015).

Furthermore, social inequality showed a negative and significant influence on consumption, with a t-statistic of -1.992, greater than 1.96 in absolute value. This suggests that a high level of income inequality can suppress consumption. When income is concentrated among a small segment of the population, the overall purchasing power of society may decline, as low-income groups face limitations in spending (Ulum, 2022). High inequality may also generate social and economic instability, weakening public confidence in spending and investment.

In this context, digital transformation is vital in promoting inclusive economic growth in Indonesia. By leveraging digital technologies, the government and the private sector can expand access to information, education, and financial services. Digital transformation can reduce inequality by providing greater opportunities, particularly for those in lower-income segments (Machin et al., 2023). For example, digital platforms enable micro, small, and medium enterprises (MSMEs) to access wider markets, increase revenue, and contribute to GDP growth. In addition, digitalization can enhance efficiency across trade, education, and health sectors. Through technology, people can access previously unreachable services, thereby improving the quality of life and expanding consumption potential (Carolin et al., 2023). Digital transformation can also generate new employment opportunities and improve productivity, fostering more inclusive economic growth.

Overall, despite the positive influence of inclusive economic growth on consumption and the negative influence of inequality on consumption, digital transformation can effectively foster more equitable and sustainable economic growth in Indonesia. By utilizing technology and innovation, Indonesia is better positioned to address existing challenges and improve the well-being of all segments of society (Puspita, 2025). Digital transformation enhances economic efficiency and helps establish a more inclusive ecosystem, allowing all stakeholders to experience the benefits of economic growth.

Based on Table 3, in the short term, inclusive economic growth has a positive and significant influence on HDI (1.855 > 1.96). At the same time, there is no significant effect of consumption on HDI (1.133 < 1.96), and no significant effect of inequality on HDI (0.715 < 1.96). In the analysis of the short-term relationship between inclusive economic growth, consumption, social inequality, and the Human Development Index (HDI), the results indicate that inclusive economic growth has a positive and significant influence on HDI, with a t-statistic of 1.855, which is greater than the t-table value of 1.96. This finding suggests that economic growth, as reflected in GDP, contributes to improved quality of life as measured by HDI. As the economy grows, the government and the private sector tend to have greater capacity to invest in education, health, and infrastructure, all essential components of HDI (Suparmoko, 2020). Therefore, strong economic growth provides a more favorable environment for people to thrive.

However, in the same analysis, consumption shows no significant effect on HDI,

with a t-statistic of 1.133, smaller than 1.96. This indicates that increased consumption does not directly contribute to an increase in HDI in the short term. Although consumption is an important economic indicator, its effect on quality of life may not be immediately observable (Mastira et al., 2024). It is possible that other factors, such as government policies and investment in the social sector, play a more decisive role in enhancing HDI than individual consumption. In addition, social inequality also shows no significant effect on HDI, with a t-statistic of 0.715, which is smaller than 1.96. This result implies that in the short term, income distribution inequality does not significantly impact the quality of life. Although inequality remains a critical issue in economic development, its impact in this context appears insufficient to directly influence HDI (Hababil et al., 2024). Nevertheless, if left unaddressed, high levels of inequality may hinder economic growth and quality of life in the long term.

In research, digital transformation serves as a key driver for promoting inclusive economic growth in Indonesia. By leveraging digital technology, the government and the private sector can expand access to education, health services, and essential information to improve quality of life (Estiarto et al., 2024). Digital transformation contributes to reducing inequality by offering greater opportunities to society, particularly for those in the lower economic segments. For instance, digital platforms support micro, small, and medium enterprises (MSMEs) in reaching broader markets, increasing revenue, and contributing to inclusive economic growth (Tarumingkeng, 2024). Furthermore, digitalization enhances efficiency across various sectors, including education and healthcare. With the use of technology, individuals can access previously difficult services, thereby improving their quality of life and capacity to contribute to economic growth. Digital transformation also enhances job creation and productivity, supporting more inclusive economic growth (Uken et al., 2024).

Despite the positive influence of inclusive economic growth on HDI and the lack of significant effects from consumption and inequality on HDI, digital transformation remains an effective instrument for fostering more equitable and sustainable economic growth in Indonesia. Through technology and innovation, Indonesia addresses existing challenges and improves outcomes for all segments of society (Massa et al., 2023). Digital transformation enhances economic efficiency and fosters the development of a more inclusive ecosystem, allowing all stakeholders to share in the benefits of ongoing economic growth (Ghandour, 2020).

Based on Table 3, in the short term, inclusive economic growth has a positive and significant influence on inequality (2.043 > 1.96). In contrast, consumption has no significant influence on inequality (0.748 < 1.96), and HDI also has no significant effect on inequality (-0.977 < 1.96). In the analysis of the short-term relationship between inclusive economic growth, consumption, the Human Development Index (HDI), and social inequality, the results show that inclusive economic growth has a positive and significant influence on inequality, with a t-statistical value of 2.043, which is greater than the t-table value of 1.96. This indicates that inclusive economic growth, as reflected in GDP, can increase inequality (Dörffel & Schuhmann, 2022). As the economy grows, the benefits are not always distributed evenly across all segments of society. Some groups may gain more advantages, while others are left behind, contributing to widening inequality (Ribeiro et al., 2020).

On the other hand, consumption does not significantly influence inequality, with a t-statistic of 0.748, which is smaller than 1.96. This indicates that, in the short term, people's consumption levels do not directly affect inequality. Although consumption is an important economic indicator, its impact on inequality may not be immediately evident (Yuan et al., 2022). Structural economic factors, such as government policies and income distribution mechanisms, may be more prominent in shaping inequality than individual consumption patterns. In addition, HDI also shows no significant effect on inequality, with a t-statistic of -0.977, which is smaller than 1.96. This suggests that, in the short term, improvements in quality of life as measured by HDI do not directly and

significantly affect inequality (Morse, 2023). Although HDI encompasses critical dimensions such as education and health, gains in these areas may not be sufficient to reduce inequality. Unequal access to quality education and healthcare may persist, sustaining or exacerbating existing disparities (Hickel, 2020).

In this context, digital transformation offers a potential solution to address inequality and support inclusive economic growth in Indonesia. The government and the private sector can expand access to information, education, and financial services by utilizing digital technology. Digital transformation can reduce inequality by creating broader opportunities for the population, particularly those in lower-income groups. Digitalization can enhance efficiency across various sectors, including education and healthcare. Through technology, individuals can access previously difficult services, thereby improving their quality of life and increasing their capacity to contribute to economic growth. In addition, digital transformation can generate new employment opportunities and enhance productivity, which, in turn, can promote more inclusive economic growth.

Despite the positive influence of inclusive economic growth on inequality and the absence of significant effects from consumption and HDI on inequality, digital transformation remains an effective instrument for fostering more equitable and sustainable economic development in Indonesia. By embracing technology and innovation, Indonesia can address existing structural challenges and improve conditions across all segments of society. Digital transformation not only enhances economic efficiency but also fosters a more inclusive ecosystem, enabling broader participation in and benefit from the economic progress that takes place.

CONCLUSION

This research finds that, in the long term, consumption and the Human Development Index (HDI) have a negative and significant impact on inclusive economic growth in Indonesia. At the same time, inequality does not show a significant effect. Similar patterns are observed in the short term, where consumption and HDI continue to exert a negative and significant influence, whereas inequality remains insignificant. Conversely, inclusive economic growth positively influences consumption, HDI, and inequality. These results highlight the strategic role of digitalization in expanding access to economic opportunities, education, and financial services for low-income groups, thereby enhancing productivity and generating employment.

The implications of these findings indicate that government policy should prioritize improvements in consumption and HDI to support inclusive economic growth. Moreover, digital transformation must be integrated into economic development strategies to promote inclusive and sustainable growth. Expanding access to financial and educational services for disadvantaged groups is also essential to strengthen their economic participation. Further research is recommended to examine the relationship between digitalization and inclusive economic growth in a broader context and its implications for inequality.

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