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Digitalization as an Alternative Pillar: Moderation of Economic Constraints on IHDI in OIC Countries

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Abstract

This study aims to analyze the role of digitalization as a moderator variable in the relationship between economic limitations and the Islamic Human Development Index (IHDI) in the Organization of Islamic Cooperation (OIC) countries. The main problem raised is the low achievement of IHDI and the non-optimal use of digitalization in supporting human development. This study uses a quantitative approach with panel data from 2010 to 2023, with a sample consisting of 10 OIC countries that have complete and representative data. The analysis model used is moderated regression analysis (MRA) with the Fixed Effect Model (FEM) approach. The results show that economic limitations have a positive and significant effect on IHDI. While digitalization does not have a direct effect, it is able to strengthen the effect of the economy on IHDI as a moderating variable. Thus, digitalization can be an alternative pillar in Islam-based human development, especially in the midst of fiscal constraints and social inequality. Therefore, OIC countries need to integrate economic development strategies with digital transformation that is inclusive and based on maqāṣid al-sharī'ah to create sustainable social justice.

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INTRODUCTION

Entering the 21st century, most populations in Islamic countries still face serious challenges in human development, even though the world has entered an era of digital transformation. Amid the rapid advancement of global connectivity, a number of Organization of Islamic Cooperation (OIC) member countries still face significant challenges in the provision of basic services such as education, health, and economic welfare (Mustafa, 2020). This condition is exacerbated by structural economic inequalities and the low level of penetration and utilization of digital technology equally among the people. This imbalance hinders the ability of these countries to optimally utilize digital potential to drive inclusive development and improve the quality of life of their citizens (Asrari & Wau, 2023).

This is reflected in the Islamic Human Development Index (IHDI) indicator, which is an alternative measurement tool specifically designed to assess the quality of human development in Muslim-majority countries. Unlike the conventional Human Development Index (HDI), which focuses more on material and social aspects in general, the IHDI integrates Islamic values comprehensively, including the spiritual and ethical dimensions contained in the maqāṣid al sharī'ah principles (Mardianto, 2023). Thus, IHDI measures the quality of life of Muslims not only in terms of worldly welfare but also considers the fulfillment of basic human needs from an Islamic perspective, such as the protection of religion, soul, mind, offspring, and property (Abdul Rasool et al., 2023). This approach provides a more comprehensive and Islam-compliant picture of assessing human development in Muslim societies.

Based on a recent study, more than 65% of OIC member countries scored below the medium category, indicating that human development achievements from an Islamic perspective are still not optimal and uneven (Tambunan et al., 2022). One of the main causes of the low IHDI score is the weak economic capacity in many OIC countries. This is reflected in the gross domestic product (GDP) per capita data, where Indonesia recorded GDP growth of 5.3% in 2022. Malaysia grew 8.7% in 2022, but declined to 3.7% in 2023. (Macrotrends, 2024), Saudi Arabia and the United Arab Emirates (UAE) continue their policy of economic diversification based on the energy sector (Ayu, 2023), Qatar records growth driven by energy exports and infrastructure development (Bank, 2024), Turkey and Egypt are in the range of around 5% growth, with fiscal and political pressures (Economics, 2025), Bangladesh saw an increase from 6.4% to 6.7% (Cassette, 2023), while Pakistan showed more moderate growth (Economics, 2025), While Nigeria was affected by oil price fluctuations and political instability, it continued to carry out economic activities (Roden & Ramadani, 2023).

This condition is still lower than in non-OIC countries with comparable levels of development, which on average have exceeded USD 8,500 (Bank, 2024). This low economic carrying capacity also limits the country's fiscal ability to invest in strategic sectors such as education, health, and digitalization, which are actually the main foundations in promoting balanced and sustainable human development according to Islamic principles (Canbaz, 2022). From the perspective of Islamic economics, human development covers a broader

dimension than just economic growth, as it is based on the concept of maqāṣid al-sharīʿah, which emphasizes the importance of preserving the soul (ḥifẓ al-nafs), mind (ḥifẓ al-ʿaql), and property (ḥifẓ al-māl), all of which are directly related to the health, education, and economic welfare sectors. Therefore, the Islamic Human Development Index (IHDI) is seen as more representative of the Islamic development paradigm than conventional economic indicators (Abdul Rahim et al., 2022).

As the global order becomes increasingly digitized, digitalization provides a strategic opportunity to overcome various economic limitations, especially in the Organization of Islamic Cooperation (OIC) countries. In the context of this study, digitalization is interpreted as the process of adopting digital technology by the community, especially through the use of the internet to access education, health, and other economic activities. Based on the International Telecommunication Union report (2023), the internet usage rate in OIC countries has increased significantly, from 29.3% in 2015 to 54.7% in 2022. Internet use has been shown to expand inclusive access to online learning services, telemedicine facilities, and digital-based economic activities. A study conducted by Kamonpetch & Chou (2024) showed that a 10% increase in internet penetration in Asian countries contributed to a 1.3-point increase in the human development index. This finding indicates that digitalization has significant potential to drive development, even in the midst of fiscal constraints. Research conducted by Ejemeyovwi et al. (2019) in the West African region reinforces this argument by showing that the internet can replace the weak social role of the state.

On the aspect of digital infrastructure, OIC countries show a significant improvement trend, for example Malaysia, UAE, and Saudi Arabia recorded high scores in global digital indices such as IDI and have developed digital-based public services, 4G/5G penetration, as well as national connectivity (KNEKS, 2024), Indonesia builds strategic projects such as the Palapa Ring (KPPIP, 2019), While Turkey, Qatar, and Egypt are driving the digital transformation of the public and education sectors, countries such as Pakistan, Bangladesh, and Nigeria are beginning to strengthen national digital policies, although they still face access and equity challenges (Bank, 2024). Despite growing digitalization, the gap in human development achievements is still evident from the difference between HDI and IHDI. For example, Indonesia has a gap of 0.125, Nigeria 0.162, Saudi Arabia 0.126, and Bangladesh 0.124. Even countries with high digitization, such as the UAE and Qatar, still show a gap above 0.11 (Development, 2005). This shows that while economic growth and technology are improving, the distribution of development outcomes is still unequal. Therefore, the integration of digital infrastructure is key to strengthening the impact of GDP on more equitable and inclusive human development.

In the context of the Organization of Islamic Cooperation (OIC) countries, economic limitations remain a major challenge in achieving equitable and sustainable human development. However, advances in digitalization offer strategic opportunities to mitigate the negative impact of these economic constraints. Digitalization has the potential to act as a moderator variable that can strengthen the positive relationship between economic growth and human development outcomes, particularly through improved access to

information, public services, and social inclusion. However, studies that explicitly place digitalization as an interaction or moderating variable in relation to economic constraints and the Islamic Human Development Index (IHDI) are still very limited in the scientific literature, such as research by Malik et al. (2024) focuses on digital based economic activities and their contribution to human development from an Islamic perspective, Imsar et al. (2023), discusses the interactive role of the digital economy as an aspect of digitization in influencing national economic growth through its linkages with IHDI and investment, Meanwhile Han (2024), discusses the aspects of digitalization that are studied, namely the adoption of digital technology in the work process and social interactions in the work environment, on the other hand Vinh & Tri (2024), discuss digitalization from the aspects of technology access, digital infrastructure, and digital economy integration in national development, while Ganic (2023), focuses on digital technology infrastructure, openness, and competitiveness as determinants of economic growth and human development. Then, Rozaq (2024) focuses on access to information technology as the main instrument for improving the quality of life and human development based on maqashid sharia.

These studies place digitization as covering aspects of the digital economy, access to information and communication technology, adoption of digital technology in the workplace, openness of the digital economy, digital infrastructure, and digital economic integration. Therefore, digitization as an alternative platform in supporting human development is a novelty offered in this research. Thus, this study aims to explain digitalization as an alternative pillar in moderating the relationship between economic deprivation and the Islamic Human Development Index (IHDI) in OIC countries, as well as emphasizing the importance of a technology-based development approach that is in line with Islamic values and maqāṣid al-sharī'ah principles. Therefore, it is important to highlight digitalization not merely as an instrument for increasing economic productivity, but also as a mechanism for distributing social justice in line with Islamic values. This approach opens up new horizons in understanding human development that is not only based on material growth, but also on moral and spiritual dimensions. Digitalization in this framework, is positioned as an alternative pillar that can strengthen social justice and equitable access to development resources, without having to fully rely on conventional economic indicators such as Gross Domestic Product (GDP) per capita, it is important for OIC countries to formulate technology-based development policies that are inclusive, contextual, and oriented towards improving the quality of life of the people.

METHOD

Research Approach

This study uses a quantitative approach with a panel data analysis design to examine the relationship between economic limitations (GDP per capita), digitalization (internet use by the public), and human development (IHDI) in member countries of the Organization of Islamic Cooperation (OIC). This research is inferential in nature, with the aim of testing the moderating role of digitalization in weakening the negative impact of economic limitations

on IHDI. The model used is moderated regression analysis (MRA) in a data panel framework with a Fixed Effect Model (FEM) or Random Effect Model (REM) approach, depending on the results of the Hausman test.

The quantitative approach and panel data analysis were chosen because they are able to explain the relationship between economy, digitalization, and human development accurately and measurably across OIC countries over time. Meanwhile, a moderation regression model is used to see whether digitalization (through the use of the internet) can reduce the negative impact of economic constraints on IHDI.

Data Source and Scope

This research uses annual secondary data from 2010 to 2023 taken from international official sources, namely:

1. Gross Domestic Product (GDP) per capita (USD) taken from World Bank Development Indicators
2. Internet Usage taken from World Bank Development Indicators
3. Islamic Human Development Index (IHDI) taken from World Bank Development Indicators

Population and Sample

The population in this study includes all 57 OIC member countries. These countries are spread across Asia, Africa, the Middle East, and parts of Europe. A common characteristic of OIC countries is that they still face major challenges in terms of human development inequality, although some of them have shown significant economic progress. Their diverse levels of development and engagement in digital transformation make this group relevant to analyze collectively in the context of this research.

Based on the overall population, this study took a sample of 10 OIC member countries, namely: Indonesia, Malaysia, Turkey, Saudi Arabia, Qatar, United Arab Emirates (UAE), Bangladesh, Pakistan, Nigeria, and Egypt. This sample was purposively selected with several strategic considerations, namely: First, all countries in the sample have relatively complete and consistently accessible data on three key variables: Gross Domestic Product (GDP) growth, human development index (HDI and IHDI. Secondly, they represent the full spectrum of development conditions in the Islamic world, from countries with high economies and advanced digitalization (such as the UAE and Qatar), countries with active industrialization and structured digital transformation (such as Malaysia and Turkey), to developing countries that are accelerating their digitalization amid various structural limitations (such as Bangladesh, Pakistan and Nigeria). Third, there is diversity in the HDI-IHDI gap among these countries, which is an important indicator in analyzing human development inequality and the potential role of digitalization as a moderating factor.

Model Specifications

The econometric model used is as follows:

$$IHDIit=\beta0+\beta1GDPit+\beta2DIGit+\beta3(GDPit*DIGit)+\varepsilon it \quad (1)$$

Description:

IHDI: Islamic Human Development Index
GDP: Gross Domestic Product per capita
DIG: Digitalization
GDP*DIG: Moderation interaction
β0 : Constant
β1- β3: Coefficient matrix for each variable
i: Country
t: Time
ε: Error term

RESULT AND DISCUSSION

Model Selection Analysis

Model testing is carried out to see the best model in panel data regression, which is then considered the best estimation result in this study. The model tests carried out are as follows: first the Lagrange Multiplier test, which is carried out to obtain the best model between the common effect model (CEM) and the random effect model (REM), second the chow test, which is carried out to obtain the best model between the common effect model (CEM) and the fixed effect model (FEM), and the hausman test, which is carried out to obtain the best model between the random effect model (REM) and the fixed effect model (FEM). The model test results are depicted in the table below.

Table 1. Model Selection Analysis

Model	Chow Test	Hausman Test	Lagrange Multiplier Test
Common Effect Model	-	-	-
Fixed effect model	0.000	-	-
Random Effect Model	-	0.0036	-

Source: Eviews 12

Based on the table above, it can be explained that the selection of the best model through the Chow test compares the common effect model and the fixed effect model. The result of the prob value of the cross-sectional chi-square of 0.0000 is smaller than 0.05, so the fixed effect model is the best regression. Furthermore, the Hausman test was conducted to compare the fixed effect model and the random effect model. The results obtained by the random cross-section prob value of 0.0036 are smaller than 0.05, so the selected model is the fixed effect model; there is no need to test the model at the next stage, because in the Chow and Hausman tests, the selected model is the fixed effect model. Because this study will use the fixed effect model as the best estimate. However, the model will still be tested for classical assumptions.

Classical Assumptions

Multicollinearity test

The multicollinearity test is carried out to obtain an overview of the regression model in the study. There is a correlation between the independent variables. A good regression model should not have a correlation relationship between the independent variables. To detect the presence or absence of a correlation relationship between independent variables, the correlation matrix value between variables can be seen. If the matrix value of each relationship between independent variables is greater than 0.90, then this indicates multicollinearity. The following multicollinearity test results are depicted in the table below.

Table 2. Multikolinieritas Test

	PDB	DGL
PDB	1	-0,1223881
DGL	-0,1223881	1

Source: Eviews 12

The results above show that each matrix value between independent variables is smaller than 0.90, then it indicates the absence of multicollinearity in the model, the best of the fixed effect panel data regression model.

Panel Data Regression Analysis

Based on the results of the model selection test, the panel data regression used in the study uses the Fixed Effect Model approach and Moderated Regression Analysis as a regression analysis to test the digitalization variable as a moderating variable. The statistical results are obtained as described in the table below:

Table 3. Panel Data Regression and MRA

	Coefficient	Prob
C	3310.362	0.0000
PDB	64.69356	0.0350
DGL	0.265821	0.9583
PDB*DGL	1.189011	0.0052
F Statistic	383.3846	0.0000
R Squared	0.970542	-

Source: Eviews 12

The results of the Fixed Effect Model panel data regression test) obtained a prob value of the economic limitation variable of 0.0350, smaller than 0.05, which means that economic limitations have a significant positive effect on IHDI with a coefficient value of 64.69356, and digitalization has a prob value of 0.9583 greater than 0.05, meaning that digitalization has no significant positive effect on IHDI with a coefficient value of 0.265821. While the prob value of the interaction variable of economic limitations and digitalization is 0.0052, smaller than 0.05, meaning that digitalization moderates the effect of economic

limitations on IHDI. Then the F-statistic test obtained the probability value of F-statistic is smaller than 0.05, so statistically the variables of economic limitations and digitalization together have a significant effect on the IHDI variable. While the R-squared value in the Fixed Effect Model panel regression obtained 0.970542, which shows the ability of economic limitations and digitalization variables to explain the IHDi variable by 97 percent in the model, and the remaining 3 percent is explained by other variables outside the research model.

Economic Constraints on IHDI in OIC Countries

The results show that Economic Limitations, as measured by Gross Domestic Product (GDP) per capita, as a representation of a country's economic capacity, have a positive and significant influence on the Islamic Human Development Index (IHDI), with a coefficient of 64.69 and a significance level of 0.0350. This indicates that an increase in GDP per capita can significantly improve the quality of human development based on Islamic values in OIC member countries. This finding reflects that although most OIC countries face acute economic limitations, such as low fiscal capacity and limited public investment, national income growth is still able to sustain improvements in the quality of life of the people. The improvement is mainly seen in the fulfillment of basic needs such as education, health, and decent livelihoods, which in the IHDI framework are not only assessed from the material dimension, but also reflect the principles of maqāṣid al-sharī'ah.

This finding is in line with the view of the Endogenous Growth Theory (Romer, 1990), which asserts that a country's economic growth will have maximum impact if it is accompanied by investment in human capital and improved institutions. In the context of the Organization of Islamic Cooperation (OIC) countries, an increase in per capita Gross Domestic Product (GDP) plays a strategic role in providing wider fiscal space for the government. This fiscal space does not simply mean additional state spending funds, but further reflects the ability of the state to carry out its distributive and protective functions towards society more optimally. With increased state revenues from the economic sector, the government has greater capacity to allocate budgets to public sectors that form the backbone of human development, such as education, health, basic infrastructure, as well as social security and protection of vulnerable groups.

Quality and affordable education a key elements in sustainable human development. When GDP increases, the state can build more schools, improve the quality of teachers, and develop a curriculum that is relevant to the needs of the times, including religious education that reflects Islamic values. In terms of ḥifẓ al-'aql (protection of the intellect), the state's investment in education is a tangible form of implementing maqāṣid al-sharī'ah, which makes knowledge the foundation of civilization. Meanwhile, the results of previous studies also reinforce these findings, such as Abdul Rahim et al. (2022), emphasizing that human development in Islam cannot be separated from economic power as the foundation of the implementation of maqāṣid values. Similarly, Canbaz (2022) states that sustainable development in Islam requires a balance between economic growth and the fulfillment of

the five basic principles of maqāṣid al-sharī'ah. On the other hand, data from the World Bank (2024) shows that the majority of OIC countries are still below the ideal threshold of GDP per capita, which is less than USD 8,500 on average. This condition also explains the low achievement of IHDI in the region, as mentioned by Tambunan et al. (2022), who found that more than 65% of OIC countries obtained IHDI scores in the moderate to low category.

Thus, economic development in OIC countries is not only important from a macroeconomic perspective but is a moral and spiritual prerequisite for realizing social justice, equitable distribution of welfare, and a quality of life in accordance with Islamic values. Increasing GDP is not an end in itself, but a means to restore the state's function as the protector and servant of society within the overarching framework of maqāṣid al-sharī'ah

Digitalization as an Alternative Pillar in Moderating Economic Limitations on IHDI in OIC Countries

The results of the study show that digitalization, in this case measured through internet usage, does not have a significant direct effect on increasing the Islamic Human Development Index (IHDI), but instead plays an important role as a moderating variable on the relationship between economic limitations and IHDI, so the development of the role of digitalization as a moderating variable on human development (IHDI) is important to be understood comprehensively, especially in the context of OIC countries which have structural characteristics in the form of fiscal limitations, geographical disparities, and weak social infrastructure. Digitalization in this case serves not only as a support, but as a functional substitute for the role of the state in the provision of essential basic services, so that it can bridge the shortcomings due to weak economic capacity.

This finding can be explained through the approach of the Digital Transformation and Equity of Access Theory introduced by Castells (2011), in which information technology becomes a means of democratizing access to education, health, and economic resources. In the context of countries with limited fiscal capacity, such as many OIC countries, there is often not enough budget to build schools or hospitals in every corner of the region. This is where digital transformation takes over as an enabler, for example, through e-learning platforms that allow people in remote areas to still get quality education without having to access physical infrastructure directly. Similarly, in the health sector, the existence of telemedicine applications and online consultations is a new channel that is inclusive for low-income people who previously experienced mobility limitations or were unable to reach formal health services in the city center. This is in line with the research results of Kamonpetch & Chou (2024), which show that a 10% increase in internet penetration can increase the human development index by 1.3 points, as well as the findings of Ejemeyovwi et al. (2019), in West Africa, which proves that the internet can replace the social functions of the state in the context of public services. Research by Imsar et al. (2023) and Malik et al. (2024) shows that digitalization strengthens human development in the maqāṣid perspective, while Rozaq (2024) adds that digitalization distributes justice values through the

Islamic financial system and information literacy. In this context, digitalization is not a substitute for economic growth, but a catalyst that accelerates and expands the impact of growth on the quality of life of Muslim societies.

Thus, digitalization can be a moderating variable as it provides an alternative and efficient pathway to fulfilling basic human development rights amid structural limitations. Digitalization bridges the gap between economic potential and social achievement, opens equal access to resources, and accelerates the realization of maqāṣid values in contemporary development practices in Islamic countries. Therefore, development strategies in OIC countries that rely solely on economic growth without digital acceleration will find it difficult to produce optimal, equitable, and sustainable IHDI achievements. Therefore, human development in OIC countries cannot solely rely on increasing GDP, but must be integrated with a digital transformation that is inclusive and rooted in Islamic values. Digitalization must be understood as an alternative pillar, not just a technical tool, but as a spiritual and social instrument in realizing adl, rahmah, and maslahah. Thus, digital technology-based development policies in the Islamic world must be holistic, contextual, and maqāṣid-oriented as a way to break the barriers of inequality and promote sustainable social justice.

CONCLUSION

Based on the research results, economic limitations represented by GDP per capita have a positive and significant influence on the Islamic Human Development Index (IHDI) in OIC countries. This shows that economic growth remains an important foundation in improving the quality of life of Muslim communities. Although digitalization does not have a significant direct effect on IHDI, it plays an important role as a moderator variable that strengthens the positive impact of GDP on IHDI.

As such, digitalization serves as an alternative pillar in human development, especially amid fiscal and infrastructure constraints, so development strategies in OIC countries cannot simply focus on the economy, but also need to strengthen digital transformation that is inclusive and Islamic in nature. Therefore, it is recommended to explore broader indicators of digitalization, such as the quality of ICT infrastructure and digital literacy, and use a mixed-methods approach to make it more contextual. In practical terms, digitalization should be positioned as a tool for equal access to basic services, not just technology, but also as a spiritual instrument in realizing the values of social justice, compassion, and benefit in the development of the ummah.

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