

Exploring the Impact of Financial Inclusion on Human Development: Evidence from Developing Countries

Kiran Hayat, Haleema Sadia and Jawad Ahmad Azeez¹

Abstract

Financial inclusion is vital for attaining sustainable development goals. Acknowledging its importance, this study assesses the role of financial inclusion in fostering human development for developing countries from 2004 to 2021. The authors construct two composite indices for financial inclusion. The first index relies on two dimensions: usage and availability of financial services, whereas the second index accounts for three dimensions. The latter considers banking penetration in addition to the first two dimensions. The authors use the System GMM method to evaluate how financial inclusion helps in fostering human development. The study estimates two models involving two and three-dimensional financial inclusion indices. The results reveal that financial inclusion promotes human development in both models. The study proposes attaining financial literacy to reap the benefits of financial inclusion. Further, collaboration between policymakers and financial service providers may enhance financial inclusiveness. Policies may be directed to guarantee that financial services stay affordable for underprivileged individuals. In rural areas, affordability provides a conducive environment for fostering human development.

Key Words: Human development index, Financial inclusion, Financial services, Generalized methods of moments

JEL Classification: G5, G20, O15

1. Introduction

An inclusive financial system plays a vital role in human development. Such a system provides the financial resources to upgrade the lives of people. The significance of this role can be derived from the sustainable development literature. The growing emphasis on sustainable development goals (SDGs) set by the World Bank pinpoints that economic development is not enough unless and until it affects the lives of individuals. Financial inclusion (FI) and human development (HD) are undoubtedly instrumental in

¹ Authors are respectively MS Scholar, Assistant Professor and Lecturer at Department of Economics, International Institute of Islamic Economics, International Islamic University, Islamabad. Email of corresponding author: haleema.sadia@iiu.edu.pk

attaining these SDGs. The financial inclusion strategy aims to achieve 7 out of 17 SDGs, highlighting the policy relevance of financial inclusion for developing countries (Klapper et al., 2016). Likewise, four SDGs emphasize on HD. This relevance prompted the researchers to inquire how FI affects HD in the context of sustainable development literature.

FI has two broader objectives. The first is the economic objective, which includes equitable growth, mobilization of savings, and enhancement of the financial system's volume. The second is social and political objectives, aiming to reduce poverty, achieve sustainable development, and inclusive growth for all. Both these objectives are collectively known as socioeconomic objectives. Attainment of these objectives paves the way for HD (Planning Commission of Pakistan, 2007).

Acknowledging the policy relevance of FI in raising HD, developing countries designed strategies and took initiatives to promote FI. Consequently, FI increased from 42% in 2011 to 71% in 2021 in developing countries (Demirguc-Kunt et al., 2022). This study empirically re-examines whether FI helps developing countries attain the socioeconomic objective of promoting HD.

This study adds to the existing literature in multiple ways. It constructs two multi-dimensional indices of financial inclusion (IFIs). These multi-dimensional indices measure FI more comprehensively than the single-dimensional measures of FI. Also, this study evaluates the influence of computed IFIs on the HD of sampled developing countries.

2. Literature Review

This section briefly reviews previous theoretical and empirical studies concerning the effects of FI on the human development index (HDI). Literature suggests that FI provides an enabling environment for enhancing HD. It carries social benefits for individuals by providing a means of living. Thus, the countries reaping such benefits excel in economic growth, employment, and equality (Helmy, 2024; Klapper et al., 2016; Kling et al., 2020; Miranda-Lescano et al., 2023).

Several studies highlighted that the availability and accessibility of banking services contribute to HD (Mehry et al., 2021; Morgan & Churchill, 2018; Voica, 2017;

Hettiarchchi, 2014). They believe HD enhances when financial services become available at an affordable cost. Likewise, easy access to finance helps the vulnerable segments of society by providing self-employment opportunities. Bihari (2011) theorized that access to financial services enhances the living standards of individuals by acquiring better education and health services and earning income.

Empirically, the literature explored the nexus between FI and HD for panel data. For instance, Ofosu-Mensah Ababio et al. (2020) concluded that an inclusive financial system is a means to alleviate poverty, increase the living standards of households, reduce income inequality, and improve the level of HD for a sample of 20 frontier markets. Similarly, Astuti et al. (2022) inferred that FI enhanced human well-being in 31 Indonesian provinces. They further showed that FI helps to boost the HD level by reducing poverty. Abdelghaffar et al. (2023) also explored a positive nexus between FI and HD in low- and middle-income countries.

A few studies showed how an inclusive financial system elevates the HDI score in Indian economies. Singh and Yadava (2022) revealed that HDI scores followed an upward trend with high FI. Along the same lines, Kumari (2022) studied the role of FI for HD in 28 Indian states. The results revealed that states with the highest rank in FI enjoyed higher HDI scores than states with low FI.

Moreover, Huang et al. (2023) found that lower FI caused a decline in HD in Sub-Saharan Africa. The authors highlighted that income inequality leads to low levels of FI and HD. Another study by Musah (2022) also documented a positive influence of FI and HD in 45 African countries.

Several studies presented how a financially inclusive financial system affects HDI. FI's role in HD in developing countries has yet to be studied for a large sample. This study explores how a financially inclusive society fosters HD in the broader set of developing countries.

3. Methodology

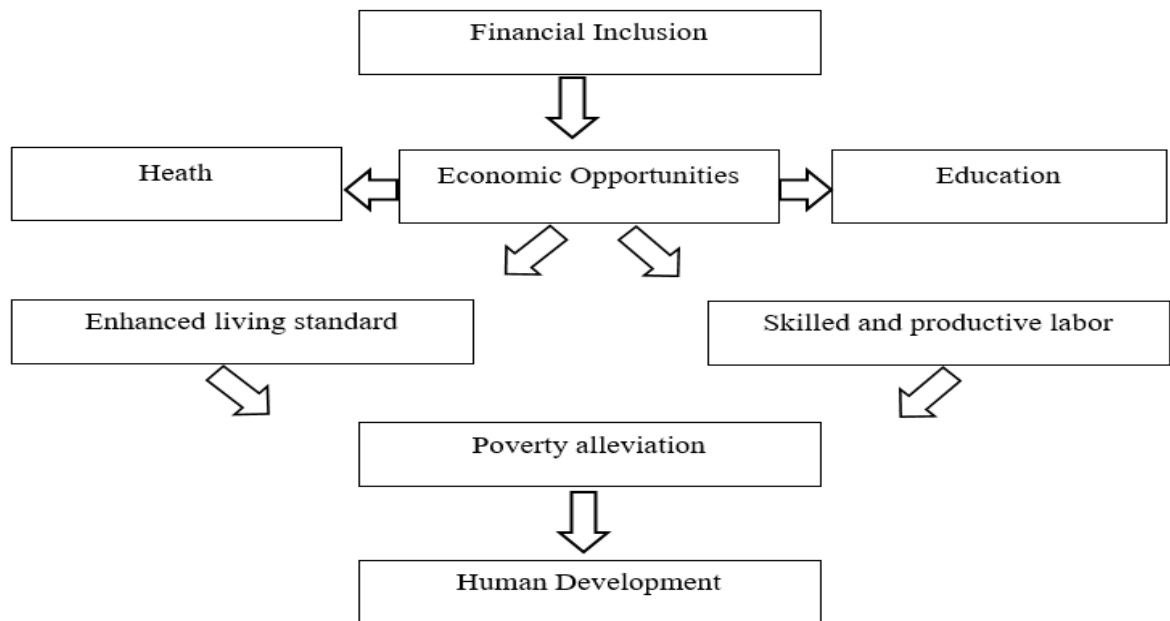
This section outlines the proposed methodology for analyzing how FI affects HD for the panel of developing countries. The first sub-section builds the conceptual framework and specifies the models to be estimated. The following sub-section

discusses data and the construction of variables. The last sub-section explains the estimation procedure for quantifying the impact of FI on HD for the sampled developing countries.

3.1 Conceptual Framework

Theoretical literature suggests various channels through which FI fosters HD. These channels are complex, as pointed out by many researchers (Laha, 2015; Beck et al., 2007). The most significant channel is through the impact of FI on income inequality and poverty. High inequality and poverty hinder the achievement of high HDI scores. Poor people need more capacity to invest in education and healthcare as they stay less engaged in income-earning activities. FI enables them to earn income, narrow income inequality, and alleviate poverty. Figure 1 explains the linkages through which an inclusive financial system affects HD.

Figure 1: Conceptual Framework for Financial Inclusion and Human Development



Source: Author's elaboration

An inclusive financial system provides many economic opportunities for the poor, such as education and healthcare services. These opportunities upgrade their skills and

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

improve their living standards. Thus, high FI helps to attain higher living standards, eradicate poverty and inequality, and promote HD.

Model Specification

This study specifies the following model that aligns with Julius and Oladiipo (2020) to evaluate FI's impact on HD.

$$HDI_{it} = \alpha_1 + \alpha_2 HDI_{it-1} + \alpha_3 IFI_{it} + \sum_j^k \alpha_{4j} X_{jit} + u_{it} \quad (1)$$

where HDI_{it} = Human development index for the i^{th} country at the time t

HDI_{it-1} = Lag term of human development index for the i^{th} country at time t

IFI_{it} = Index of financial inclusion for the i^{th} country at the time t

X_{jit} = j^{th} control variables for the i^{th} country at the time t

Lagged values of the dependent variable are included in the model to explore the dynamic effects in the models.²

3.2 Data and Measurement of Variables

This study considers panel data for developing countries from 2004 to 2021. Since data on financial inclusion is available only from 2004 onwards, this forced us to take 2004 as the starting year. This study selects the samples of developing countries according to the country classification of the United Nations Development Program (UNDP). HDI index for the sampled countries is retrieved from the *UNDP Database*. Data on various dimensions of FI are taken from the *Financial Access Survey* published by IMF. Data on control variables is collected from the *World Development Indicators Database* of the World Bank.

3.2.1 Measurement of Human Development

According to UNDP, HDI is the most appropriate index for measuring HD. It is a multi-dimensional index, comprising three dimensions. A long and healthy life is the first dimension, measured through life expectancy at birth. The second dimension is

²The authors consider higher order lags of HDI. Insignificant impact at higher lags compelled to drop them.

knowledge, evaluated by mean years of schooling (for adults aged 25 and older) and mean years of education (for school-entering-age children). The last dimension is the decent living standards, measured through per capita GNI (PPP\$). This study uses the normalized values of HDI scores.

3.2.2 Measurement of Financial Inclusion

This study builds two IFIs following the methodology of Sarma (2008). The first IFI (Model I) consists of two dimensions: availability and use of banking services for 88 developing countries. The second index contains three dimensions of IFI (Model II). The added dimension is banking penetration, besides the availability and use of banking services. Limited data on banking penetration restricts the sample to 62 countries for the 3-dimensional IFI.³ The authors confined to only three dimensions of FI as consistent data is unavailable for other dimensions for the large sample of developing countries.

Dimension 1: Banking Penetration

Banking penetration (BP) is a fundamental characteristic of an inclusive banking system. It refers to the number of people holding a bank account. It varies between 0 and 1, with one showing that all the individuals in a country keep a bank account, and 0 indicating none of the individuals holds an account.

Dimension 2: Availability of Banking Services

Availability of banking facilities refers to easy availability to the users. The authors measure availability by either the number of bank outlets, the number of ATMs, or the number of bank employees. However, data for the number of employees is unavailable for many developing countries. This data constraint compelled us to use the number of commercial bank branches per 100,000 adults/users and the number of ATMs per 100,000 adults.

Dimension 3: Usage of Banking Services

Usage refers to the characteristic that a bank account holder also adequately uses banking services. These services include loan and mortgage facilities, debit and credit

³ A list of the sampled countries in Model I and Model II is given in appendix Table A1 and A2, respectively.

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

card services, overdraft services, and checking and saving account services. This study takes two indicators to measure this dimension. These are outstanding deposits and outstanding loans as a percentage of GDP.

The choice of indicators solely relies upon data availability for most countries. Other indicators,

such as the number of registered mobile money accounts, the number of registered mobile money agent outlets, the value of mobile money transactions, and affordability and timeliness, are also available for measuring FI. Nevertheless, these are not considered as data before 2012 is not available. This study computes the dimensions of IFI using the following formula.

$$d_i = \frac{A_i - m_i}{M_i - m_i} \quad (2)$$

where A_i = The actual value of the i^{th} dimension

m_i = The minimum value of the i^{th} dimension

M_i = The maximum value of the i^{th} dimension

The value of each dimension lies between 0 and 1. The high value of any dimension (d_i) indicates high achievement in that dimension in the respective country. $D_i = (d_1, d_2, d_3)$ represents three dimensions for the i^{th} country on the three-dimensional Cartesian space. In three-dimensional space, point $O = (0,0,0)$ shows the worst situation, whereas point $I = (1,1,1)$ refers to the highest achievement in all dimensions. This study uses the normalized inverse Euclidean distance of point D_i from the ideal point $I = (1,1,1)$ for computing IFI. Finally, IFI is developed using the following formula:

$$IFI_i = 1 - \frac{\sqrt{(1-d_1)^2 + (1-d_2)^2 + (1-d_3)^2}}{\sqrt{3}} \quad (3)$$

The second expression's numerator denotes D_i 's Euclidean distance from the ideal point. The distance is normalized by subtracting the square root from 1. IFI varies between 0 and 1, where the former manifests the lowest and later denotes the highest level of FI. Inverse distance confirms that a high value of IFI corresponds to a high FI.

3.2.3 Control Variables

This study considers a variety of control variables to avoid the model misspecification. These are GDP per capita, internet penetration, unemployment rate, foreign direct investment, inflation, health expenditure, and trade openness.

GDP per Capita

GDP per capita indicates the country's prosperity and purchasing power. An increase in per capita GDP increases the spending on education and health. This ultimately boosts the HDI score (Miladinov, 2020; Elistia & Syahzuni, 2018).

Internet Penetration

Internet penetration (IP) refers to the fraction of individuals that have used the internet from any location. IP indicates the state of digital infrastructure. Better digital infrastructure contributes to human development through increased education for all beyond physical or geographical barriers through increased research and development for productivity (Grigorescu et al., 2021; Ejemeyovwi et al., 2019).

Unemployment

The unemployment rate (UR) indicates the portion of the unemployed labor force actively seeking a job. Unemployment erodes the purchasing power of individuals and adversely affects HD. High UR decreases the private sector expenditures on the components of human development. This would ultimately lowers the HDI score (Chowdhury & Chowdhury, 2023; Sani, 2021; Ejukwu & Okwudiri, 2019)

Foreign Direct Investment

Foreign direct investment (FDI) is the net inflow of investment. The recent literature emphasized the role of investment policies in enhancing HD (Apinran et al., 2018). Literature has shown a positive and significant impact of FDI on HD for middle and low-income countries (Ofosu-Mensah Ababio et al., 2020). However, some studies raised concerns that the findings are not robust (Matekenya et al., 2021; Apinran et al., 2018).

Inflation

The existing literature suggests that inflation (INF) carries a mixed impact on HD. Few studies mentioned that inflation leads to low HDI scores as it erodes the purchasing

power of individuals and discourages their spending on education and health (Muhammad et al., 2023; Koyuncu & Yalcinkaya, 2022). A low inflation rate creates recession and increases poverty, while too high inflation lowers social welfare.

Health Expenditure

Public expenditure on health (HEX) is one of the main instruments and essential policies to enhance the citizens' quality of life. Higher spending increases life expectancy and HDI scores (Miranda-Lescano et al., 2023; Mirahsani, 2016).

Trade Openness

Trade openness (TO) measures the extent to which a country is engaged in the global trading system. It facilitates access to goods and services, technologies, and ideas, besides providing economic opportunities in the related sector. The ultimate impact is a high level of HD. (Kabadayi, 2013). According to Byaro et al. (2021), TO fosters HD by providing better healthcare facilities.

3.3 Diagnostics and Estimation Procedure

This study uses generalized methods of moments (hereafter GMM) developed by Arellano and Bond (1991) to estimate the impact of FI on HD (Equation 1). Later, Arellano and Bover (1995) and Blundell and Bond (1998) further developed it as a system GMM. This method removes any bias created by unobserved country-specific effects and caters to the endogeneity problem. This method eliminates any bias created by unobserved country-specific effects and caters to the endogeneity problem. The authors perform two diagnostics tests following Sadia et al. (2022). The first test applied is the Arellano-Bond test to check serial correlation. Second is the Hansen's J test to examine the validity of instruments.

4. Results and Discussion

This section discusses the results of regression analysis for Models I and II. The first sub-section discusses the findings of Model I. The following sub-section conducts regression analysis for Model II.

4.1 Result for Model I Involving Two-Dimensional IFI

The study's first objective is to determine how two-dimensional IFI affects the level of HDI. Table 1 presents the results of the regression analysis for 88 developing

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

countries. The lagged value of HDI captures the dynamic effects. The study initially considered three lags of HDI, but the impact at the second and third lags was insignificant, compelling to drop the higher-order lags. The findings reveal that HDI significantly follows the inertia effect as a high HDI in the previous year raises the HDI score in the current year by 0.92 units. The coefficient of IFI is economically and statistically significant. It indicates that a unit increase in IFI raises the HDI score by 0.62 units. The study confirms the findings of Abdelghaffar et al. (2023) and Chowdhury and Chowdhury (2023).

**Table 1: Two-Dimensional Index of Financial Inclusion
and Human Development: System GMM**

Variables	Coefficients
Log(L.HDI)	0.9213*** (0.000)
log((IFI)	0.6020*** (0.001)
log(GDPPC)	0.0126* (0.070)
log(IP)	0.0621*** (0.000)
UR	-0.0836** (0.0400)
log(FDI)	-0.0028 (0.1082)
INF	-0.0247 (0.102)
log(HEX)	0.02515*** (0.000)
log(TO)	0.041* (0.082)
Obs	1370
Countries	88
<i>Diagnostic Tests</i>	
F statistics	224.24*** (0.000)
AR(1) Arrelano-Bond Test	-4.03 (0.000)
AR(2) Arrelano-Bond Test	0.32 (0.752)
Hansen Test	5.85 (0.6125)

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

Source: Author's Estimates

Note: Significance at 1 %, 5%, and 10%, is denoted by ***, **, and *, respectively. The dependent variable is HDI. It refers to the human development index (HDI). IFI refers to a two-dimensional financial inclusion index. The control variables for the study are GDP per capita (GDPPC), internet penetration (IP), unemployment (UR), foreign direct investment (FDI), inflation (INF), health expenditures (HEX), and trade openness (TO). Values in parentheses represent P-values.

Next, the GDP per capita growth rate has a positive and significant coefficient. It reflects an improvement in living standards, which helps to attain a high HDI. This finding is consistent with the study of Miladinov (2020). IP has marginally improved the level of HD. The impact is significant statistically. A 1% increase in internet users increases the HDI by a mere 0.06 units. The small coefficient reflects the poor digital infrastructure in developing countries besides the digital illiteracy. The negative and statistically significant coefficient of UR confirms the theoretical notion that an increase in UR lowers HDI. Unemployment reduces the private sector's health and education spending, besides affecting the quality of life. Ultimately, economies suffering from high unemployment tends to underperform in the HDI score.

An exception to the empirical results exists in the shape of a negative but insignificant coefficient of FDI. It manifests that there is either too low FDI or sub-optimal aid utilization for alleviating poverty and raising HDI. Furthermore, inflation has shown a negative and insignificant impact on HD. High inflation reduces the purchasing power and erodes living standards. Low real income discourages spending on education and health and results in low HD.

The finding is consistent with Koyuncu and Yalcinkaya (2022) and Muhammad et al. (2023). Similarly, high HEX enhances the health dimension index's contribution to HDI. A 1 percent change in HEX fosters HDI by 0.025 units. High spending on health reduces mortality, raises human capital, and promotes HD. TO has a significant positive coefficient. A 1% increase in trade openness brings a 0.014 unit increase in HD. TO promotes access to goods, services, technologies, and ideas, besides increasing employment opportunities in tradable sectors. The ultimate impact is high HD. The value of F statistics is substantially high, indicating the overall goodness of fit. The

bottom part of Table 1 reports the diagnostics. The first is the Arellano-Bond test for serial correlation. The high probability value for AR(2) confirms that the model is free from second-order autocorrelation. The second diagnostic test is the Hansen test. A high probability value indicates that the instruments are valid.

4.2 Result for Model II Involving Three-Dimensional IFI

The second objective of this study is to unfold how a three-dimensional IFI affects HDI in developing countries. Table 2 documents the regression results of system GMM. The findings confirm the inertia effect, as shown by the positive and statistically significant value of the lagged HDI. The conclusion is statistically significant at 1%. The study reconfirms the findings of Matekenya et al. (2021). However, Model II demonstrates more significant results as compared to Model I.

The coefficient of growth in GDP per capita is 0.031, which is statistically significant at 1%. In contrast to Model I, the coefficient of GDP per capita is high in Model II. A unit increase in GDP per capita enhances the HD by 0.031 units. IP boosts the level of HD as the coefficient is positive and significant. A 1 % increase in IP raises HDI by 0.040 units. Empirical results once again show a significant negative impact of UR on HDI. Similarly, INF and FDI have a negative but significant impact on HD. In contrast, the results were insignificant in Model I. The coefficients of TO and HEX are also positive and significant. This shows that promoting TO and enhancing health expenditures enables countries to achieve high HDI scores. An increase in health expenditure makes labor more healthy and productive.

This enables to achieve higher economic growth, which directly affects people's income. Hence, people's living standards and HDI improve. The coefficient of health expenditure has marginally improved in Model II. The diagnostic test for serial correlation in Table 2 reveals that the probability value for AR (2) value is 0.792. this is higher than 0.05. Meanwhile, the probability value of AR (1) is 0.028, which is lower than 0.05. Thus, the null hypothesis of no second-order serial correlation is accepted.

**Table 2: Three-Dimensional Index of Financial Inclusion
and Human Development: System GMM**

Variables	Coefficients
Log(L.HDI)	0.8721*** (0.002)
log(IFI)	0.6912*** (0.000)
log(GGDPC)	0.03120* (0.069)
log(IP)	0.0401*** (0.004)
UR	-0.1786* (0.060)
log(FDI)	-0.0038* (0.072)
INF	-0.0819* (0.086)
log(HEX)	0.1571*** (0.002)
log(TO)	0.027* (0.06)
Obs	925
Countries	62
<i>Diagnostic Tests</i>	
F statistics	219.01*** (0.000)
AR (1) Arrelano-Bond Test	-1.2744 (0.028)
AR (2) Arrelano-Bond Test	0.2915 (0.7921)
Hansen Test	6.4801 (0.671)
Source: Author's Estimates	
<p>Note: Significance at 1 %, 5%, and 10%, is denoted by ***, **, and *, respectively. The dependent variable is HDI. It refers to the human development index (HDI). IFI refers to a two-dimensional financial inclusion index. The control variables for the study are GDP per capita (GDPPC), internet penetration (IP), unemployment (UN), foreign direct investment (FDI), inflation (INF), health expenditures (HEX), and trade openness (TO). Values in parentheses represent P-values.</p>	

The second diagnostic test is the Hansen test. The probability value of the Hansen test is 0.671, which is higher than 0.05. Thus, we accept the null hypothesis that instruments are valid. These diagnostics confirm that GMM estimates are reliable.

5. Conclusion and Policy Recommendations

The study confirms that FI promotes HD significantly in developing countries. However, this impact is more pronounced for the Model involving a three-dimensional IFI. The expected signs of control variables are consistent with the existing literature. The study concludes that GDPPC, IP, HEX, and TO affect HDI positively. Whereas high UR, FDI, and INF discourage HD. IP has the most significant coefficient in Model I. A significant positive impact of GDP per capita, internet penetration, health expenditure, and trade openness on HDI is observed in Model II. However, HEX carries the most significant influence on HDI. The key findings are robust to the measurement of IFI.

The study recommends the following policy measures to enhance the degree of FI in developing countries that may foster HD. First, the policymakers in developing countries may focus on raising financial literacy through a more inclusive financial system that provides awareness about access and use of financial services. Collaboration between policymakers and financial service providers can play a role. Second, policies may be directed to ensure affordable financial services for underprivileged individuals. In rural areas, affordability provides a conducive environment for fostering HD. Third, accessibility to bank branches and ATMs should be enhanced in rural areas. Fourth, enhanced digital infrastructure, literacy rates, and healthcare spending directly influence access to digital resources of knowledge and healthcare, trading, financial technologies, and innovations.

Limitation and Future Direction

Smooth and consistent data is unavailable on various dimensions of FI. Likewise, some other aspects of FI, such as financial technology (Fintech) and inclusive green finance, can further improve the modeling of FI.

References

- Abdelghaffar, R. A., Emam, H. A., & Samak, N. A. (2023). Financial inclusion and human development: Is there a nexus? *Journal of Humanities and Applied Social Sciences*, 5(3), 163–177. <https://doi.org/10.1108/jhass-11-2021-0178>
- Apinran, M. O., Taşpınar, N., & Gökmenoğlu, K. K. (2018). Impact of foreign direct investment on human development index in Nigeria. *Business and Economics Research Journal*, 9(1), 1–13. <https://doi.org/10.20409/berj.2018.90>
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–29. <https://doi.org/10.2307/2297968>
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, Vol. 68(1), 29-51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)
- Astuti, I. P., Sugiyanto, F. X., Kurina, A.S. (2022). The role of financial inclusion in poverty reduction: A production theory approach. *Economic and Business Horizons*, 1(1), 24-32. <https://journal.lifescifi.com/index.php/ebh/article/view/78>
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality, and the poor. *Journal of Economic Growth*, 12, 27-49. DOI:10.1007/s10887-007-9010-6
- Bihari, S. C. (2011). Financial Inclusion for Indian Scene. *SCMS Journal of Indian Management*, 8(3), 7–18.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87, 115–143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
- Byaro, M., Nkonoki, J., & Mayaya, H. (2021). The contribution of trade openness to health outcomes in sub-Saharan African countries: A dynamic panel analysis. *Research in Globalization*, 3, 100067. <https://doi.org/10.1016/j.resglo.2021.100067>
- Chowdhury, E. K., & Chowdhury, R. (2023). Role of Financial Inclusion in Human Development: Evidence from Bangladesh, India and Pakistan. *Journal of the Knowledge Economy*, 1-26. <https://doi.org/10.1007/s13132-023-01366-x>
- Demirguc-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022). *The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19*. World Bank Publications.
- Ejemeyovwi, J. O., Osabuohien, E. S., Johnson, O. D., & Bowale, E. I. (2019). Internet usage, innovation, and human development nexus in Africa: the case of ECOWAS. *Journal of Economic Structures*, 8(1), 1-16. <https://doi.org/10.1186/s40008-019-0146-2>
- Ejukwu, E., & Okwudiri, A. D. (2019). Unemployment And Economic Development In Nigeria (1980-2017). *Advances in Social Sciences Research Journal*, 6(1). <https://doi.org/10.14738/assrj.61.5827>
- Elistia, E., & Syahzuni, B. A. (2018). The correlation of the human development index (HDI) towards economic growth (GDP Per Capita) in 10 ASEAN member countries. *Journal of Humanities and Social Studies*, 2(2), 40–46. <https://doi.org/10.33751/jhss.v2i2.949>
- Grigorescu, A., Pelinescu, E., Ion, A. E., & Dutcas, M. F. (2021). Human capital in the

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

- digital economy: An empirical analysis of Central and Eastern European countries from the European Union. *Sustainability*, 13(4), 1–21. <https://doi.org/10.3390/su13042020>
- Helmy, A. (2024). The mutual interdependence between financial inclusion and human development and their effects on economic development: Comparative study between Egypt and The BRICS countries. *Arab Journal of Administration*, 44(2), 227–244. <https://doi.org/10.21608/aja.2021.65317.1057>
- Hettiarchchi, B. (2014). Impact of financial inclusion for alleviation of poverty and unemployment. *Journal of Social Sciences*, 1(01), 343–356.
- Huang, W., Gu, X., Lin, L., Alharthi, M., & Usman, M. (2023). Do financial inclusion and income inequality matter for human capital? Evidence from sub-Saharan economies. *Borsa Istanbul Review*, 23(1), 22–33. <https://doi.org/10.1016/j.bir.2022.09.002>
- Juliusliu, O., & Oladiipo, E. (2020). Financial inclusion and human development in Sub-Saharan Africa. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 11(1), 01–09.
- Kabadayi, B. (2013). Human development and trade openness: A case study on developing countries. *Advances in Management and Applied Economics*, 3(3), 193–199.
- Klapper, L., El-Zoghbi, M., & Hess, J. (2016). Achieving the sustainable development goals: The role of financial inclusion, 23(5). Available online: <http://www.ccgap.org>.
- Kling, G., Pesque-Cela, V., Tian, L., & Luo, D. (2020). A theory of financial inclusion and income inequality. *The European Journal of Finance*, 28(1), 137–157. <https://doi.org/10.1080/1351847X.2020.1792960>
- Koyuncu, C., & Yalcinkaya, J. (2022). The long-run impact of inflation on human development and poverty in Turkey. *Balkan and Near Eastern Journal of Social Sciences*, 8(03), 129–135.
- Kumari, M. (2022). Financial inclusion and human development in India: An inter-state analysis. *International Journal of Economics Development Research*, 3(1), 1–12.
- Laha, A. (2015). Association between Financial Inclusion and Human Development in South Asia: A Cross-Country Analysis with Special Reference to India, *Journal of Economic Policy and Research*, 10(2), 69–91.
- Matekenya, W., Moyo, C., & Jeke, L. (2021). Financial inclusion and human development: Evidence from Sub-Saharan Africa. *Development Southern Africa*, 38(5), 683–700. <https://doi.org/10.1080/0376835X.2020.1799760>
- Mehry, E. B., Ashraf, S., & Marwa, E. (2021). The impact of financial inclusion on unemployment rate in developing countries. *International Journal of Economics and Financial Issues*, 11(1), 79–93.
- Miladinov, G. (2020). Socioeconomic development and life expectancy relationship: evidence from the EU accession candidate countries. *Genus*, 76(1). <https://doi.org/10.1186/s41118-019-0071-0>
- Mirahsani, Z. (2016). *The relationship between health expenditures and human development index*. *Journal of Research & Health*, 6(3), 373–377.

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

- <https://doi.org/10.7508/jrh.2016.03.011>
- Miranda-Lescano, R., Muinelo-Gallo, L., & Roca-Sagalés, O. (2023). Human development and decentralization: The importance of public health expenditure. *Annals of Public and Cooperative Economics*, 94(1), 191–219. <https://doi.org/10.1111/apce.12373>
- Morgan, L., & Churchill, C. F. (2018). Financial inclusion and health: How the financial services industry is responding to health risks (Paper; No 51), *International Labor Organization*
- Muhammad, T., Temidayo, A. T., & Bashir, B. (2023). Analysis of inflation and standard of living in Nigeria. *Journal of Oil and Gas Research*, 3(1), 52–58.
- Musah, A. (2022). Financial inclusion as a gateway to human development in Africa. *International Journal of Business and Technology Management*, 4(4), 76–82.
- Ofosu-Mensah Ababio, J., Attah-Botchwey, E., Osei-Assibey, E., & Barnor, C. (2020). Financial inclusion and human development in frontier countries. *International Journal of Finance & Economics*, 26(1), 42–59. <https://doi.org/10.1002/ijfe.1775>
- Planning Commission of Pakistan (2007), *The Government of Pakistan*.
- Sadia, H., Bhatti, A. A., & Azeez, J. A. (2022). Determinants of Financial Stress : Panel Data Analysis of Emerging Countries. *Business & Economic Review*, 14(2), 57–78. <http://bereview.pk/index.php/BER/article/view/448/260>
- Sani, Y. (2021). The impact of unemployment on the quality of life IHDI in Nigeria 2010 2019, Bachelors thesis, *Department of Economics*, Ahmadu Bello University
- Sarma, M. (2008). Index of Financial Inclusion. *Indian Council for Research on International Economic Relations*, Working Paper No. 215, New Delhi
- Singh, B. P., & Yadava, A. K. (2022). Technical efficiency of financial inclusion and human development: Insights from the Indian states. *Economic Notes*, 51(2), e12199. <https://doi.org/10.1111/ecno.12199>
- Voica, M. C. (2017). Financial Inclusion As a Tool for Sustainable Development. *Romanian Journal of Economics*, 44(1), 121–129. <http://www.revecon.ro/articles/2017-1/2017-1-10.pdf>

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

Appendix A

Table A1: Sampled Countries for Model 1

S #	Country's Name	S #	Country's Name	S #	Country's Name
1	Albania	31	Fiji	61	Nigeria
2	Algeria	32	Gambia, The	62	North Macedonia
3	Angola	33	Georgia	63	Oman
4	Argentina	34	Ghana	64	Pakistan
5	Armenia	35	Guatemala	65	Panama
6	Azerbaijan	36	Guinea	66	Paraguay
7	Bangladesh	37	Guinea-Bissau	67	Peru
8	Belarus	38	Honduras	68	Philippines
9	Belize	39	India	69	Qatar
10	Benin	40	Indonesia	70	Rwanda
11	Bahamas, The	41	Iraq	71	Saudi Arabia
12	Bhutan	42	Jamaica	72	Senegal
13	Bolivia	43	Kazakhstan	73	Serbia
14	Bosnia and Herzegovina	44	Kenya	74	Singapore
15	Botswana	45	Korea, Rep.	75	South Africa
16	Brazil	46	Kuwait	76	Thailand
17	Brunei Darussalam	47	Kyrgyz Republic	77	Timor-Leste
18	Burkina Faso	48	Lebanon	78	Togo
19	Cabo Verde	49	Lesotho	79	Tunisia
20	Cameroon	50	Madagascar	80	Turkey
21	Chad	51	Malaysia	81	Uganda
22	Chile	52	Mali	82	Ukraine
23	China, People's Republic	53	Mexico	83	United Arab Emirates
24	Colombia	54	Mongolia	84	Uruguay
25	Costa Rica	55	Montenegro	85	Uzbekistan
26	Cote d'Ivoire	56	Morocco	86	Vietnam
27	Dominican Republic	57	Mozambique	87	Zambia
28	Ecuador	58	Namibia	88	Zimbabwe
29	Egypt, Arab Rep.	59	Nepal		
30	El Salvador	60	Nicaragua		

*Exploring the Impact of Financial Inclusion on Human Development:
Evidence from Developing Countries¹*

Table A2: Sampled Countries for Model II

S #	Country's Name	S #	Country's Name
1	Algeria	32	Jamaica
2	Argentina	33	Kenya
3	Armenia	34	Korea, Rep.
4	Azerbaijan	35	Lebanon
5	Bahamas, The	36	Lesotho
6	Bangladesh	37	Madagascar
7	Belize	38	Malaysia
8	Bhutan	39	Mexico
9	Bolivia	40	Mongolia
10	Bosnia and Herzegovina	41	Montenegro
11	Botswana	42	Morocco
12	Brazil	43	Mozambique
13	Brunei Darussalam	44	Namibia
14	Cameroon	45	Nicaragua
15	Chile	46	Republic of North Macedonia
16	China, People's Republic	47	Pakistan
17	Colombia	48	Panama
18	Costa Rica	49	Paraguay
19	Dominican Republic	50	Peru
20	Ecuador	51	Philippines
21	Egypt, Arab Rep.	52	Rwanda
22	El Salvador	53	Saudi Arabia
23	Fiji	54	South Africa
24	Gambia, The	55	Thailand
25	Georgia	56	Turkey
26	Ghana	57	Uganda
27	Guatemala	58	Ukraine
28	Guinea	59	United Arab Emirates
29	Honduras	60	Uzbekistan
30	India	61	Zambia
31	Indonesia	62	Zimbabwe