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The impact of financial inclusion on economic growth in developing countries

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Abstract

This study analyzes the impact of financial inclusion on economic growth in 104 developing countries from 2004–2019. We construct a novel composite financial inclusion index and apply the dynamic panel estimation technique to examine the impact of financial inclusion. The results indicate that financial inclusion positively correlates with economic growth in developing countries but not in high-income countries. This study shows that financial inclusion affects economic growth primarily by expanding opportunities for lower-income people. With increased financial access, those in the lower-income bracket can expand their economic activity, which results in economic growth in developing countries. In high-income countries, access to financial services is already high, and financial inclusion may not offer new opportunities to a larger segment of the population. The study also compares financial inclusion and financial development. The results suggest that financial inclusion contributes to financial development in developing countries by enhancing access to financial services. The findings recommend that policymakers in developing countries may use financial inclusion to increase economic growth.

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Access to finance
Economic growth
Financial development
Financial inclusion.

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1. Introduction

This study investigates the impact of financial inclusion on economic growth in developing countries.[1] It compares the impact of financial inclusion and financial development on economic growth in both developing and high-income countries. The results indicate that financial inclusion affects economic growth primarily by expanding opportunities for lower-income people.

Country-specific studies by Brune, Giné, Goldberg, and Yang (2011), Babajide, Adegboye, and Omankhanlen (2015), and Lenka and Sharma (2017) indicate that financial inclusion improves resource allocation and increases economic growth in developing countries. Cross-country and panel studies show

[1] The World Bank's income categories are used to classify countries into four groups: high-income, upper-middle-income, lower-middle-income, and low-income countries. Upper-middle-income, lower-middle-income, and low-income countries are labeled as developing countries. The list of countries organized by income groups is presented in Appendix A.

different ways through which financial inclusion can affect economic growth. Cabeza-García, Del Brio, and Oscanoa-Victorio (2019) argue that financial inclusion encourages the economic participation of women and contributes to gross domestic product (GDP) growth in developing countries. Kim (2016) claims that financial inclusion also reduces income inequality and increases economic growth. Younas, Qureshi, and Saleh (2022) found that financial inclusion can improve economic growth by reducing the size of the shadow economy in developing countries. A detailed literature review is provided in Section 2 of this article.

Although previous studies have proposed alternative explanations on how financial inclusion affects economic growth, they do not clarify why financial inclusion affects economic growth differently among the different income groups of countries. This study aims to examine this issue. The Global Financial Inclusion (Global Findex) Database (2017) reveals that a large segment of financially excluded people has low income and cannot access formal financial services, primarily due to poverty. Access to financial services allows these people to expand their economic activities, which may help achieve higher economic growth in developing countries. The significant positive impact of financial inclusion is expected only within developing countries because, due to the current level of high financial access in high-income countries, financial inclusion may not offer new opportunities to a larger proportion of the population. This study proposes that financial inclusion affects economic growth by expanding opportunities for financially excluded people, particularly those in the lower-income bracket. This study constructs a novel financial inclusion index to examine the effects of financial inclusion on economic growth. The results show that financial inclusion has a significant positive impact on economic growth in developing countries but not in high-income countries. This study also investigates the impact of financial inclusion on poverty and income inequality in explaining the proposed transmission mechanism. It argues that if financial inclusion achieves economic growth due to increased economic activities among the lower-income population, the poverty rate and income inequality should also fall. The study found that poverty and income inequality indeed drop due to financial inclusion in developing countries.

This research also compares the effects of financial inclusion and financial development on economic growth. It finds that in contrast to financial inclusion, which only has a significant impact in developing countries, financial development has a significant positive impact on economic growth in both developing and high-income countries. This study argues that financial inclusion contributes more to financial development in developing countries by enhancing the depth and access to financial services. In addition to access to financial services, the efficiency of financial institutions and markets is also essential for financial development. As developing countries do not usually have active capital markets or very efficient institutions, this study suggests that financial inclusion may influence financial development to some extent in developing countries.

The findings of this study offer important recommendations for policymakers. In developing countries where many are still financially excluded, financial inclusion should be increased to promote economic growth, and disadvantaged groups, such as women, should have more access to financial services. To attain a higher level of financial development, it is also suggested that policymakers in developing countries should improve the efficiency of financial institutions and capital markets. The rest of this article is set out as follows: Section 2 reviews literature on financial inclusion and economic growth; Section 3 explains the theoretical framework and the construction of the financial inclusion index and compares financial inclusion and financial development; Section 4 discusses the methodology and results; and Section 5 contains a summary discussion and policy recommendations.

2. Financial Inclusion and Economic Growth: Review of Literature

Country-specific studies have analyzed the impact of financial inclusion on economic growth primarily by applying time series techniques. Several studies have found that financial inclusion supports economic growth by ensuring higher deposit mobilization. Brune et al. (2011) found that the microfinance program promotes savings in Malawi. Babajide et al. (2015) showed that more deposit allocation through financial inclusion leads to increased investment and economic growth in Nigeria. Using the autoregressive distributed lag (ARDL) technique and the error correction model (ECM), Lenka and Sharma (2017) found similar results in India. Aduda and Kalunda (2012) and Omojolaibi (2017) identified that lowering collateral requirements and increasing access to credit have contributed to economic growth and poverty reduction in Kenya and Nigeria. Angadi (2003); NealL (1990) and North (1990) opined that financial inclusion increases economic growth by helping to establish a well-developed financial infrastructure. Beck, Demirgüç-Kunt, and Levine (2007) argued that financial inclusion channelizes money to lower-income people and contributes to increasing economic growth. Khan (2011) and Serrao, Sequeira, and Hans (2012) found that access to essential financial services boosts the economic participation of disadvantaged groups in India, resulting in higher economic growth. Ghosh (2011) also found a significant impact of financial inclusion but argued that the quality of state-level institutions and infrastructure affects economic growth through financial inclusion. Various researchers have analyzed the impact of financial inclusion on economic growth using cross-country and panel data estimation techniques. Kim (2016) found that financial inclusion positively affects growth primarily by improving the income inequality scenario in 40 Organization for Economic Co-operation and Development (OECD) and European Union (EU) countries from 2004 to 2011. Kim, Yu, and Hassan (2018) examined the relationship between financial inclusion and economic growth in 55 Organization of Islamic Cooperation (OIC) countries from 1990 to 2013, adopting system generalized method of moments (GMM) and vector autoregressive (VAR) methodologies. The study found that

financial inclusion had a positive impact on the economic growth of OIC countries. Karim, Nizam, Law, and Hassan (2022) examined the impact of financial inclusiveness on economic growth using a sample of 60 emerging and less developed countries from 2010 to 2017. Adopting a dynamic panel threshold estimation technique, the authors found that the impact of financial inclusion is positive and has a more significant growth-enhancing effect among less developed and emerging market countries relative to developed ones. Cabeza-García et al. (2019) showed that greater financial inclusion of women, measured by access to bank accounts and credit cards, has a positive effect on economic development in 91 developing countries. Emara and El Said (2021) investigated the relationship between financial inclusion, governance, and economic growth in 44 Middle Eastern and North African (MENA) countries.

The results indicate that financial inclusion has a significant impact only in the presence of strong institutions. Huang, Kale, Paramati, and Taghizadeh-Hesary (2021) adopted the fully modified least squares (FMOLS) method to examine the relationship between financial inclusion and economic development in 27 European Union (EU) countries from 1995 to 2015. The results indicate that financial inclusion indicators have a significant positive impact on economic growth in EU countries and the impact is stronger in new EU and low-income EU economies. Marcelin, Egbendewe, Oloufade, and Sun (2022) analyzed the impact of financial inclusion and bank ownership structure using data from 44 developing countries from 2004 to 2017. The study used the dynamic panel estimation method and found that financial services support economic growth, but foreign bank participation reduces GDP growth through restricted intermediation.

Studies that have focused on developing countries have found several other ways by which financial inclusion affects economic growth. Younas et al. (2022) found that financial inclusion can improve economic growth by reducing the size of the shadow economy in developing countries. Several studies have identified that financial inclusion facilitates the creation of a well-organized financial system that promotes economic growth. Andrianaivo and Kpodar (2011) showed that mobile phone development consolidates the impact of financial inclusion on economic growth in African countries. Inoue and Hamori (2016) found that financial access has a statistically significant and robust effect on increasing economic growth in 37 Sub-Saharan African countries. Andrianaivo and Kpodar (2011) used the generalized method of moments (GMM) approach and found that financial inclusion positively and significantly impacts economic growth in 44 African countries. Rasheed, Law, Chin, and Habibullah (2016) used bank branches and the number of automated teller machines (ATMs) per 100,000 adults to measure financial inclusion.

They investigated the impact of financial inclusion on economic growth in 97 countries during the 2004–2012 period, and the results indicate that financial inclusion positively affects economic growth. Sethi and Acharya (2018) applied the dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS) methods in 31 countries and found that financial inclusion positively influences economic growth in these countries. Studies on financial development have mostly found that it has a positive impact on economic growth. Using World Bank survey data on six different countries, Dabla-Norris, Yan, Townsend, and Unsal (2015) showed that alleviating different financial frictions contribute to economic growth, and country-specific characteristics play a central role in determining the linkages and trade-offs between inclusion, economic growth, and inequality.

Hassan, Sanchez, and Yu (2011) found a positive relationship between financial development and economic growth in developing countries but argued that a well-functioning financial system is necessary but is in an insufficient condition to reach steady economic growth in developing countries. Most studies found that financial development primarily increases economic growth by ensuring efficient intermediation and resource allocation. Nguyen, Le, Ho, Nguyen, and Vo (2022) found that financial development positively impacts economic growth and has a bidirectional causality with economic growth in 22 emerging market countries. Samargandi, Fidrmuc, and Ghosh (2015) investigated the relationship between financial development and economic growth in a panel of 52 middle-income countries from 1980–2008. They showed an inverted U-shaped relationship between finance and growth using pooled mean group estimations in a dynamic panel setting. Some studies did not find a positive impact of financial inclusion on economic growth.

Pearce (2011) argues that the inability of financial services to reach the majority of the population, including the poor, women, elders, and other disadvantaged groups, could be the reason behind the non-significant effect. Moore and Craigwell (2003) claim that smaller financial products do not produce a higher financial return for commercial banks compared to the operating costs of providing the service. Natamba, Mangeni, Nakabuye, Brendah, and Agasha (2013) found similar results concerning the impact of the high transaction costs of micro-finance products.

Although the impact of financial inclusion on economic growth has been extensively studied from various perspectives, some questions remain unanswered. Existing studies have proposed several channels through which financial inclusion might affect economic growth but have not adequately investigated these channels. Moreover, why financial inclusion significantly impacts economic growth in developing countries but not in high-income countries has not been evaluated. Also, previous studies have not shed light on the interlinkage between financial inclusion and financial development. This study contributes to the existing literature by providing new explanations for these issues.

3. Financial Inclusion and Financial Development

3.1. Theoretical Framework and Financial Inclusion Index Construction

In developing countries, many financially excluded people are living below the poverty line and as such, do not have access financial services.[2] If these excluded groups could gain access to financial services, they could use them to smooth out consumption, increase savings, and open and expand businesses. Financial inclusion provides these disadvantaged groups with opportunities to expand their economic activities, which might contribute to higher economic growth. This study examines the possibility that financial inclusion influences economic growth primarily by expanding opportunities for lower-income people.[3]

The model specification of previous studies (Hassan et al., 2011; Kim et al., 2018; Nguyen et al., 2022; Samargandi et al., 2015) is used to analyze the impact of financial inclusion on economic growth in a panel setting. To investigate the effectiveness of the channel, this study examines the impact of financial inclusion on poverty and income inequality because if financial inclusion achieves economic growth due to increased economic activities of lower-income people, the poverty rate and income inequality should also fall.

This study constructs an equal-weighted composite financial inclusion index to investigate the impact of financial inclusion on economic growth. The index applies six sub-indicators and uses data from commercial banks, credit unions, credit cooperatives, and microfinance institutions. The composite index value ranges between zero and one, where a higher value indicates a higher financial inclusion level. The particulars of the indicators of the index are presented in Table 1.

Table 1. Indicators used for the construction of the financial inclusion index.

SL	Name of the indicators	Observation
1.	Number of financial institution branches per 100,000 adults	3.040
2.	Number of ATMs per 100,000 adults	2.667
3.	Number of depositors with financial institution per 1,000 adults	3.036
4.	Number of deposit accounts with financial institutions per 1,000 adults	1.760
5.	Number of borrowers with financial institutions per 1,000 adults	1.460
6.	Number of loan accounts from financial institutions per 1,000 adults	1.490

Source: Financial Access Survey (FAS), IMF.

The index is constructed by improving the methodology used by Sarma (2012). First, the standardized score for each indicator is estimated by applying Equation 1.

$$d_{ijt} = \frac{x_{ijt} - m_i}{M_i - m_i}, \tag{1}$$

Where, d_{ijt} represents standardized value for an indicator of a country at time *t*, x_{ijt} is the actual value of indicator *i* for country *j* at time *t*, M_i is the upper limit and m_i is the minimum value of indicator *i*. Equation 1 ensures that each indicator has a standardized score (dit) that lies between zero and one.

After the standardization, all the indicators are aggregated based on normalized Euclidean distance as follows:

$$FII = \frac{1}{2}(X_1 + X_2), \tag{2}$$

$$X_1 = \frac{\sqrt{d_1^2 + d_2^2 + \cdots + d_6^2}}{\sqrt{w_1^2 + w_2^2 + \cdots + w_6^2}}, \tag{3}$$

$$X_2 = 1 - \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \cdots + (w_6 - d_6)^2}}{\sqrt{w_1^2 + w_2^2 + \cdots + w_6^2)}}. \tag{4}$$

In Equations 2–4, FII (the financial inclusion index) measures the financial inclusion score of each country. X_1 represents the Euclidian distance from the worst point, while X_2 is the inverse distance from an ideal point. In addition, d_i represents the indicator-specific scores of the countries gathered from Equation 1, and w_i indicates the weight of each dimension. In contrast to Sarma (2012), this study assigns equal weight to each dimension. It also uses six dimensions instead of three used by Sarma (2012). This study also resolves the missing value problem in any given period by assigning zero weights for indicators with missing values. This method is better suited for developing countries, which have missing values for different indicators.

[2] Global Financial Inclusion (Global Findex) Database (2017) also identifies poverty as a primary reason for financial exclusion.
[3] Previous studies have suggested several channels through which financial inclusion might affect economic growth in developing countries, such as improved intermediation, greater employment of women, and a reduced shadow economy due to a higher level of financial inclusion.

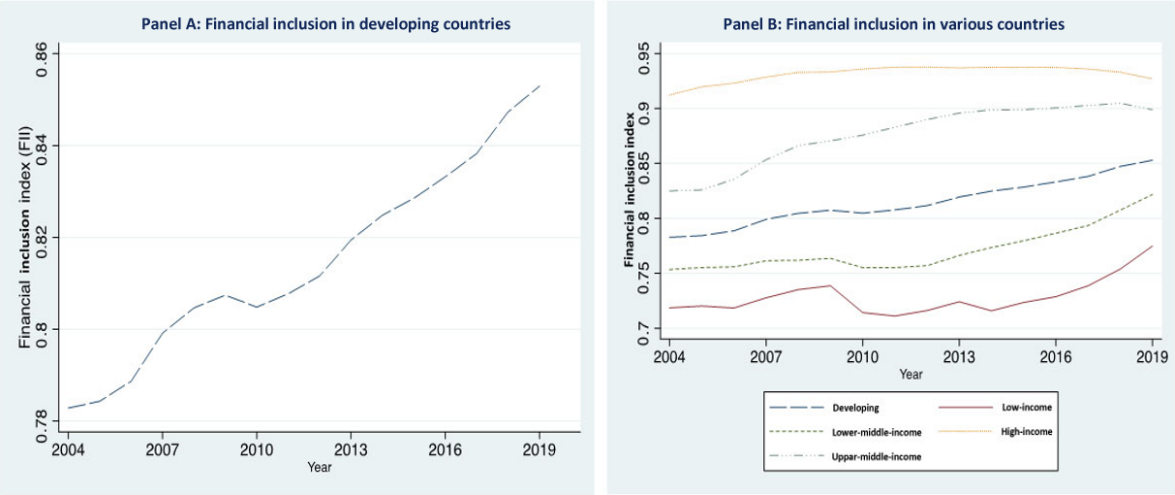

Figure 1. Financial inclusion index in different groups of countries.

Source: Financial Access Survey (FAS), the IMF.

The composite index has maximum, minimum, and average values of 1, 0.094, and 0.851, respectively, for all countries from 2004 to 2019. The country-wise index is presented in Appendix B.[4] Panel A of Figure 1 above shows the gradual increase in financial inclusion level in developing countries over the years, whereas Panel B shows the scenario for the different income groups of countries. From Panel B, it is evident that there is scope for more financial inclusion in developing countries. In high-income countries, the current level of financial inclusion is relatively high, and there is not much scope for more financial inclusion.

3.2. Financial Inclusion and Financial Development in Developing and High-Income Countries

According to the World Bank, the financial sector is a set of institutions, instruments, markets, and legal and regulatory frameworks that permit transactions. Financial development generally means reducing costs incurred in the financial system, such as the costs of acquiring information, and enforcing contracts, which results in the emergence of financial contracts, markets, and intermediaries. This study uses the financial development index developed by the International Monetary Fund (IMF) to measure financial development. As per the IMF methodology, the financial development index examines the quality of financial institutions and financial markets in terms of their depth (size and liquidity), efficiency (financial institutions' ability to provide financial services at low costs and activity level in capital markets), and access (the ability of people to access financial services). The index values range from zero and one, and a higher value indicates more financial development.

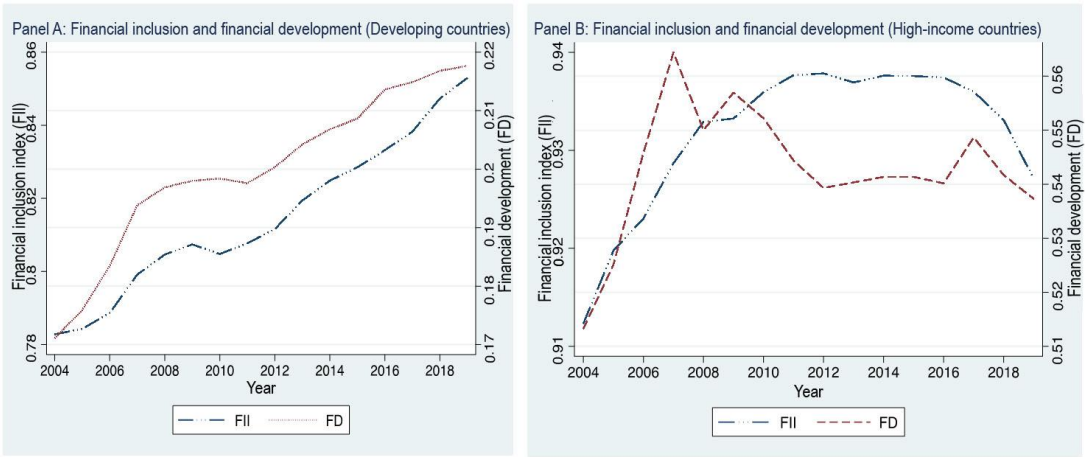

Figure 2. Financial inclusion and financial development in developing and high-income countries.

Source: Financial Access survey (FAS), IMF.

Panel A of Figure 2 reveals that the financial inclusion and financial development indices follow a similar trend in developing countries. Financial inclusion may contribute to more financial development by improving the access component of financial development. As developing countries do not have very active capital markets,

[4]Panel B lists the financial inclusion index scores for 128 developing countries. However, the regression results cover fewer countries due to missing values for relevant variables in some countries.

improvement in the efficiency of the capital market does not play a significant role in improving financial development. Panel B of Figure 2 shows that financial inclusion and financial development do not always follow a similar trend in high-income countries. Although financial inclusion mostly follows an upward trend, the financial development index is more volatile, especially during the global financial crisis. In high-income countries, the efficiency of financial institutions and capital markets plays a more critical role in achieving higher financial development. As the depth and access to financial services are already high in these countries, financial inclusion has a limited role in improving financial development. Figure 2 shows that the financial development (FD) index has higher values in high-income countries compared to developing countries, suggesting that financial inclusion may not substantially improve financial development without improving financial institutions and capital market efficiency.[5]

Previous studies, such as those by Babajide et al. (2015) and Lenka and Sharma (2017), opine that financial inclusion may increase economic growth through improved intermediation. However, this study argues that better resource allocation and intermediation primarily happen through financial development. Financial inclusion has a limited role because it may not affect the efficiency of the capital market and financial institutions, which are essential for better intermediation. In contrast to improved intermediation, this study proposes that financial inclusion may affect economic growth by opening opportunities for lower-income people.

4. Empirical Examination of Financial Inclusion's Impact on Economic Growth

4.1. Model Specification, Data, and Method

The list of variables used in this study and their definitions and data sources are presented in Table 2.

Table 2. Definitions of variables and data sources.

Variable	Definition	Source
GDP growth per capita (GDPPCGR)	Real annual growth of GDP per capita measured in constant USD 2010 prices.	World Development Indicators (WDI), World Bank (WB)
Financial inclusion index (FII)	An equal weighted composite financial inclusion index. The index value remains between zero and one, where a higher value indicates higher financial inclusion.	Financial access survey (FAS), IMF.
Initial log of GDP per capita (lnGDPPC)	Log of GDP per capita in the year 2004.	WDI, WB
Trade openness (TRADE)	Trade openness is measured by the sum of exports and imports as a percentage of GDP.	WDI, WB
Govt. expenditure (GOVT)	Government consumption expenditure as a percentage of GDP.	WDI, WB
Human capital (HUMAN CAP)	Gross primary school enrolment ratio.	WDI, WB
Gross capital formation (GCF)	Gross capital formation consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	WDI, WB
Inflation (INF)	Annual change in price level.	WDI, WB
Poverty	Log poverty headcount ratio at USD 1.9 a day, measured in 2011 international prices.	WDI, WB
Log of Gini	Log of the Gini coefficient.	WDI, WB
Rule of law (Rule)	Perceptions of the extent to which agents have confidence in and abide by the rules of society.	World Governance Indicators, WB.
Financial development (FD)	Index constructed by the IMF. The index values lie between zero and one.	Financial Development Index database, IMF

This study uses data from the IMF's Financial Access Survey (FAS) for the index construction. For the financial development index, the IMF's financial development index database was used. For most control variables, the study relies on the World Bank's World Development Indicators (WDI), and for the "Rule of law" variable, data were collected from the World Bank's World Governance Indicators (WGI).

The study constructs a database for 104 countries covering the period from 2004 to 2019. Real GDP growth per capita is the dependent variable for this analysis. Table 3 presents the descriptive statistics for other key variables for developing countries. Due to the difference in the number of observations for each variable, the structure is unbalanced panel data.

[5] Figure 2 shows that high-income countries also have a higher level of financial inclusion than developing countries. However, the difference in financial inclusion between high-income and developing countries is substantially smaller than the difference in their financial development levels, highlighting the importance of improving the efficiency of financial institutions and capital markets.

Table 3. Descriptive statistics of the key variables: Developing countries.

Variable	Observations	Mean	Std. deviation	Minimum	Maximum
GDP growth per capita (GDPPCGR)	2,089	2.601	5.466	-62.378	121.780
Financial inclusion index (FII)	2,064	0.814	0.100	0.094	1
Trade openness (TRADE)	1,940	79.821	37.405	0.167	347.997
Govt. expenditure (GOVT)	1,812	16.031	10.365	2.047	115.933
Human capital (HUMAN CAP)	1,193	88.745	12.647	35.251	100.001
Gross capital formation (GCF)	1,799	24.808	9.562	-3.945	79.401
Inflation (INF)	2,095	7.230	10.206	-26.700	174.858
Financial development (FD)	2,000	0.199	0.133	0	0.740
Poverty headcount	617	11.203	17.364	0	94.300
Rule of law	2,169	-0.572	0.647	-2.606	1.410

Source: World development indicators (WDI), World governance indicators (WGI), the World bank, and the IMF financial access survey (FAS). Computation of financial inclusion index.

The study applies the two-stage system generalized method of moments (GMM) method for the analysis. This method uses both the level and lag values of the variables as instruments and is more appropriate for addressing the endogeneity and serial correlation issues. Our model is shown in Equation 5.

$$GDPPCGR_{it} = \alpha + \beta_1 GDPPCGR_{it-1} + \beta_2 FII_{it} + \gamma Z_{it} + \varepsilon_{it} \qquad (5)$$

Here, the dependent variable is per capita real GDP growth (GDPPCGR). As the study follows the system GMM method, the lag value of the dependent variable is used as an independent variable. The composite financial inclusion index (FII_{it}) is the primary independent variable. Z_{it} is a vector of control variables, which includes the initial log GDP per capita (initial log GDPPC), trade openness (TRADE), government expenditure as a percentage of GDP (GOVT), primary school enrolment (HUMAN CAPITAL), gross capital formation (GCF), and inflation rate (INF). This study expects a positive and significant coefficient for the financial inclusion index, indicating that financial inclusion increases economic growth. The initial log of GDP per capita is used to capture the difference in growth rate due to the differences in initial income level. A negative coefficient will support the convergence hypothesis that per capita income in lower-income countries tends to grow faster than in higher-income countries. Trade openness (TRADE) captures the influence of international factors on economic activity. Government expenditure as a percentage of GDP (GOVT) is used to capture the impact of public spending. The primary school enrolment (HUMAN CAP) rate is used as a proxy for human capital. Gross fixed capital formation (GCF) accounts for investment in physical capital, and inflation (INF) is used as a proxy for macroeconomic environments. We perform several statistical tests before conducting the regression analysis. Since the panel database has many missing values, the study applies the Fisher-type unit root test to assess the stationarity properties of the variables. Most variables were found to be stationary at level. The study examines the correlation matrix among the variables. Due to the low correlation among the variables, it is assumed that the multicollinearity problem does not have a major impact on the regression results. The study also applies the Granger causality test and the results indicate that financial inclusion Granger causes economic growth, and reverse causality is not detected. By applying the modified Wald test, heteroskedasticity was found in the data and robust standard errors were used to address the issue.

4.2. Empirical Results

4.2.1. Impact of Financial Inclusion on Economic Growth in Developing Countries

Table 4 presents the results of the impact of financial inclusion on economic growth in developing countries using the system GMM method.

Column 1 of the table shows that the financial inclusion index (FII) has a significant positive coefficient with per capita GDP growth, suggesting that financial inclusion contributes to increasing economic growth. This result supports previous studies (Emara & El Said, 2021; Huang et al., 2021; Kim et al., 2018). This study proposes that financial inclusion influences economic growth primarily by facilitating increased economic activities among lower-income people.[6] Trade openness and gross fixed capital formation (GCF) have significant positive coefficients. The results also support the convergence theory. In column 2, an account in a financial institution is used as a measure of financial inclusion. Even with this simple indicator, the earlier finding remains valid as it has a significant positive coefficient. Human capital was also found to be significant in this case. The diagnostic tests indicate that all GMM requirements are satisfied and the model is well specified. The AR2 statistics in Table 4 indicate that no second-order autocorrelation exists, and the Hansen J statistics also show no over-identification problem in the analysis.

[6] Previous studies (Chliova, Brinckmann, & Rosenbusch, 2015; Duvendack et al., 2011; El-Zoghbi, Holle, & Soursourian, 2019; Kara, Zhou, & Zhou, 2021); also confirm that access to financial services opens up different opportunities for financially excluded people.

Table 4. Impact of financial inclusion on economic growth in developing countries: Dynamic two-stage system GMM method.

Time frame: 2004–2019, yearly panel		
Variable	**(1)**	**(2)**
	Dependent variable: GDPPC growth	
Lag of the dependent variable	0.133	0.167
	(0.084)	(0.105)
Initial log of GDPPC	-22.563***	-22.569***
	(4.777)	(6.972)
FII	35.249**	
	(14.787)	
Account in a financial institution		0.006*
		(0.003)
Trade openness	0.069*	0.098
	(0.042)	(0.072)
Government	-0.196	0.187
	(0.155)	(0.521)
Human capital	0.308	0.323*
	(0.228)	(0.186)
Gross capital formation	0.166*	-0.040
	(0.094)	(0.141)
Inflation rate	0.058	-0.010
	(0.056)	(0.087)
Constant	115.718***	134.368***
	(25.276)	(45.032)
Diagnostic tests		
Observations	940	481
Number of countries	104	70
Number of instruments	71	69
AR2	0.494	0.319
Hansen J statistics	0.147	0.506

Note: Dynamic two-stage system GMM panel method. Significance levels are denoted by *** p < 0.01, ** p < 0.05, and * p < 0.1. Robust standard errors are in parentheses.

4.2.2. Comparison of the Effect of Financial Development and Financial Inclusion on Economic Growth

This section compares the effect of financial development and financial inclusion on economic growth.

Table 5. Impact of financial development on economic growth in developing and high-income countries: Two-stage system GMM method.

Time frame: 2004–2019, yearly panel		
Variable	**Developing countries**	**High-income countries**
	(1)	**(2)**
	Dependent variable: GDPPC growth	
Lag of the dependent variable	0.103	0.232***
	(0.088)	(0.081)
Initial log of GDPPC	-18.741***	-25.046***
	(5.191)	(7.784)
Financial development	59.668**	59.446**
	(33.483)	(26.583)
Trade openness	0.098**	0.045
	(0.048)	(0.033)
Government	-0.258**	0.131
	(0.116)	(0.362)
Human capital	-0.076	-0.331
	(0.155)	(0.413)
Gross capital formation	0.107	0.132
	(0.109)	(0.201)
Constant	135.888***	245.690**
	(37.178)	(94.339)
Diagnostic tests		
Observations	921	570
Number of countries	102	55
Number of instruments	70	44
AR2	0.277	0.114
Hansen J statistics	0.172	0.143

Note: Dynamic two-stage system GMM panel method. Significance levels are denoted by *** p < 0.01 and ** p < 0.05. Robust standard errors are in parentheses.

Table 5 shows that the financial development index has significant positive coefficients in developing and high-income countries. The results align with previous studies (Hassan et al., 2011; Nguyen et al., 2022; Samargandi et al., 2015) that argue that financial development increases economic growth by ensuring an efficient intermediation process.

Does financial inclusion affect economic growth in a similar way to financial development? This study suggests that financial inclusion can partially affect financial development because by enabling financially excluded people to access and utilize financial services, financial inclusion improves the access component of financial development. However, other factors also affect financial development, such as improving the efficiency of financial institutions and markets. As more financial inclusion does not necessarily contribute to improved efficiency of financial institutions and capital markets, financial inclusion should not influence economic growth in the same way as financial development does.

In contrast to financial development, which significantly impacts economic growth in both developing and high-income countries, financial inclusion influences economic growth only in developing countries.

Table 6. The impact of financial inclusion on economic growth in developing and high-income countries: two-stage system GMM method.

Time frame: 2004–2019, yearly panel		
Variable	**Developing countries**	**High-income countries**
	(1)	**(2)**
	Dependent variable: GDPPC growth	
Lag of the dependent variable	0.083	0.249***
	(0.102)	(0.063)
Initial log of GDPPC	-27.877***	-12.492*
	(7.029)	(6.334)
FII	31.950**	4.741
	(16.611)	(50.113)
Trade openness	0.075	0.017
	(0.058)	(0.028)
Government	-0.262	0.134
	(0.173)	(0.334)
Human capital	0.854***	0.090
	(0.267)	(0.253)
Gross capital formation	0.018	-0.080
	(0.115)	(0.155)
Constant	112.095***	122.360*
	(29.384)	(61.876)
Diagnostic tests		
Observations	940	570
Number of countries	104	55
Number of instruments	46	44
AR2	0.967	0.051
Hansen J statistics	0.170	0.131

Note: Dynamic two-stage system GMM panel method. Significance levels are denoted by *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. Robust standard errors are in parentheses.

Table 6 shows the analysis results of the impact of financial inclusion on economic growth in developing and high-income countries. Column 1 of Table 6 reveals that financial inclusion significantly impacts economic growth in developing countries. However, column 2 shows that the financial inclusion index (FII) coefficient is insignificant in high-income countries.

The results are similar to Karim et al. (2022), who also found that financial inclusion is more effective in lower-income countries. If financial inclusion affects economic growth through improved intermediation, it should also significantly impact high-income countries because they have a higher level of financial inclusion than developing countries. However, the information in Table 6 suggests that financial inclusion might affect economic growth in other ways besides improved intermediation.

In developing countries, financial inclusion can facilitate the economic activities of lower-income people by offering financial services. It is therefore proposed that improved intermediation through financial inclusion should happen due to the increased economic activities of people who were previously excluded financially. If financial inclusion affects economic growth by expanding opportunities to lower-income people, it is expected to have a less significant impact in high-income countries than in developing countries. As the financial inclusion level is very high and the poverty level is already low in high-income countries, financial inclusion is not likely to offer new opportunities to a larger segment of the population. Hence, an insignificant impact of financial inclusion is found in column 2 of Table 6.

When most people are financially included, further financial development and improved intermediation can happen only through improving the efficiency of financial institutions and capital markets. Figure 2 also supports the argument that financial inclusion contributes to financial development in developing countries but has a limited role in high-income countries. Previous studies (Huang et al., 2021; Karim et al., 2022) also indicate that the influence of financial inclusion is limited in lower-income countries.

4.2.3. Financial Inclusion's Impact on Economic Growth through the Expansion of Opportunities for Lower-Income People

This section investigates the validity of the expansion of opportunities channel. Two scenarios are expected if financial inclusion increases economic growth by expanding opportunities for lower-income people. First, the poverty rate must fall, as the rise in the income level of lower-income people is the driver of economic growth. Second, financial inclusion should reduce income inequality due to the income rise of lower-income people.

As financial inclusion enables lower-income people to enhance their economic activities, the resulting income rise may help to reduce poverty. Table 7 investigates the impact of financial inclusion on poverty in developing countries.

This study uses the log of poverty headcount of USD 1.9 per day to quantity poverty. Other control variables used in this analysis are taken from previous literature (Omar & Inaba, 2020; Park & Mercado Jr, 2018). In Table 7, the financial inclusion index (FII) has a significant negative coefficient, which suggests that financial inclusion reduces poverty in developing countries. This result supports the argument that financial inclusion expands opportunities for lower-income people.

Table 7. The impact of financial inclusion on poverty level in developing countries: Two-stage system GMM method.

Time frame: 2004–2019, yearly panel	
Variable	**Dependent variable: Log poverty headcount at $1.9 a day**
Lag of the dependent variable	0.129
	(0.189)
FII	-9.946***
	(3.039)
Log of Gini	3.443***
	(1.000)
Trade openness	0.001
	(0.005)
Government	-0.059
	(0.044)
School enrolment	0.014
	(0.019)
Inflation	-0.032***
	(0.011)
Rule	0.338
	(0.329)
Constant	-3.145
	(3.904)
Diagnostic tests	
Observations	262
Number of countries	34
No. of instruments	32
AR2	0.72
Hansen J statistics	0.48

Note: Dynamic two-stage system GMM panel method. Significance level is denoted by ***p < 0.01. Robust standard errors are in parentheses.

Studies by Gutiérrez-Romero and Ahamed (2021); Jong-Hee (2016) and Omar and Inaba (2020) found that financial inclusion reduces income inequality in developing countries. This study examines the impact of financial inclusion on income inequality in developing countries using the control variables from the Jong-Hee (2016) study.[7] Table 8 reveals that financial inclusion contributes to income inequality reduction as the financial inclusion index has a significant negative coefficient.

[7]Unemployment rate, inflation, and population growth are used as control variables.

Table 8. The impact of financial inclusion on income inequality in developing countries: two-stage system GMM method.

Time frame: 2004–2019, yearly panel	
Variable	**Dependent variable: Log of Gini**
Lag of the dependent variable	0.746***
	(0.098)
FII	-0.445*
	(0.259)
Unemployment	0.001
	(0.001)
Inflation	-0.002*
	(0.001)
Population growth	0.023*
	(0.014)
Constant	1.319**
	(0.540)
Diagnostic tests	
Observations	352
Number of countries	36
Number of instruments	30
AR2	0.698
Hansen J statistics	0.534

Note: Dynamic two-stage system GMM panel method. Significance levels are denoted by *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.1$. Robust standard errors are in parentheses.

4.3. Discussion

The Global Financial Inclusion (Global Findex) Database (2017) as well as studies by Kara et al. (2021) and Klapper and Singer (2015) reveal that lower-income people are often financially excluded. Accessing and utilizing financial services opens up opportunities for the financially excluded population to start or expand businesses, increasing overall economic growth. The results of this study support this argument and also support the statement that financial inclusion increases economic growth in developing countries by expanding opportunities for lower-income people. Table 7 shows that financial inclusion significantly reduces poverty. Poverty is reduced as economic activities among financially excluded people increase their income level. If economic growth had occurred without a significant contribution from lower-income people, poverty reduction would not have happened. This study also finds that financial inclusion reduces income inequality, which supports an income rise for lower-income people. If economic growth is induced by a shadow economy reduction and a tax revenue increase, income inequality would not have reduced.

If financial inclusion improves economic growth by ensuring better resource allocation and intermediation, it should significantly impact economic growth both in developing and high-income countries. However, the results indicate that the impact of financial inclusion is limited within developing countries. The expansion of the opportunities channel better explains this scenario. This study suggests that an increase in economic activities of lower-income people induced by financial inclusion is one of the primary reasons for improved intermediation and economic growth in developing countries. Panel B of Figure 1 shows that the proportion of financially excluded people is high in developing countries but not in high-income countries.[8] As most people in high-income countries are already financially included, financial inclusion cannot offer new opportunities to many people and cannot substantially boost economic activities.

The Global Findex Database (2021) reveals that financial inclusion improves the economic empowerment of women. Cabeza-García et al. (2019) showed that the financial inclusion of women improves GDP growth in developing countries. The data of this study reveal that women have proportionally lower account ownership in formal financial institutions than men in developing countries.[9] This study acknowledges the importance of the financial inclusion of women but argues that it's not only women who contribute to economic growth. It suggests that opportunities used by financially excluded people, irrespective of gender, influence economic growth, and financial inclusion expands opportunities for both men and women.

There is a possibility that financial inclusion does not induce economic growth. Instead, improved economic growth enables financial services to expand. The study examines this possible reverse causality issue and finds that financial inclusion Granger causes economic growth, and there is no reverse causality. Financial services can reach people who were previously excluded financially as policymakers adopt policies targeting this group. The advancement of mobile money and affordable mobile phone-based digital services have also expanded, leading to more rapid financial inclusion.

[8]The graph for the developing countries is well below the upper limit of financial inclusion, which is one. The high-income countries have financial inclusion levels close to the upper limit.
[9]The average female-to-male bank account ratio is 0.787, suggesting that women have approximately 21 percent less account ownership than men.

It was also found that financial inclusion has a significant positive impact on economic growth in sub-groups of developing countries. The results remain valid for lower-middle and low-income countries. The robustness of the results was checked using alternative control variables. Foreign direct investment (FDI) is applied instead of trade openness, and the population growth rate and institutional quality are incorporated as additional control variables. Even with these alternative sets of control variables, a significant positive impact of financial inclusion on economic growth was found in developing countries.

The findings offer important recommendations. Policymakers in developing countries can strive for more financial inclusion to promote economic growth. This tool should be more effective in countries where many are still financially excluded. Previous studies (Andrianaivo & Kpodar, 2011; Karim et al., 2022; Kim et al., 2018) have also proposed that financial inclusion can be used to increase economic growth in developing countries. Cabeza-García et al. (2019) argued that greater economic participation of women through financial inclusion improves GDP growth in developing countries. Data in this study revealed that women have lower account ownership than men. Policymakers should therefore ensure that disadvantaged groups, such as women, have access to financial services. As panel B of Figure 1 indicates that there is a scope for expanding financial services to untapped customers in developing countries, this study recommends that financial institutions grow their business by offering customized financial services that meet the needs of the users. To attain economic growth through financial development, policymakers in developing countries should focus on improving the efficiency of financial institutions and capital markets in addition to increased financial inclusion.

This study acknowledges that other transmission channels might be valid to some extent but argues that expanding the opportunities channel better explains economic growth through financial inclusion. There is, however, one possible limitation. This study has not examined whether financial inclusion contributes to reducing the size of the shadow economy channel. This issue can be investigated in the future by obtaining more information on the size of the shadow economy in developing countries.

5.Conclusion

This study examined the impact of financial inclusion on economic growth in developing countries, and the results suggest that financial inclusion has a significant positive effect on economic growth. The study argues that financial inclusion affects economic growth primarily by expanding opportunities to lower-income people in developing countries. It supports this argument by showing that financial inclusion also reduces poverty and income inequality, indicating that increased economic activities of those in the lower-income bracket contribute to higher economic growth. This study also compared financial inclusion and financial development and found that financial development may affect economic growth in developing countries through financial inclusion as it enhances the depth of and access to financial services. In high-income countries, the efficiency of financial institutions and markets is more critical for economic growth. These findings suggest that policymakers in developing countries can use financial inclusion to increase economic growth. When countries achieve a higher level of financial inclusion, they should focus on improving the financial development level by adopting policies that enhance the efficiency of financial institutions and capital markets.

References

Aduda, J., & Kalunda, E. (2012). Financial inclusion and financial sector stability with reference to Kenya: A review of literature. *Journal of Applied Finance & Banking, 2*(6), 95-120.

Andrianaivo, M., & Kpodar, K. (2011). *ICT, financial inclusion, and growth: Evidence from African countries. Review of Economic and institution.* Washington: International Monetary Fund.

Angadi, V. (2003). Financial infrastructure and economic development: Theory, evidence and experience. *Reserve Bank of India Occasional Papers, 24*(1/2), 191-223.

Babajide, A. A., Adegboye, F. B., & Omankhanlen, A. E. (2015). Financial inclusion and economic growth in Nigeria. *International Journal of Economics and Financial Issues, 5*(3), 629-637.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth, 12*(1), 27-49. https://doi.org/10.1007/s10887-007-9010-6

Brune, L., Giné, X., Goldberg, J., & Yang, D. (2011). *Commitments to save: A field experiment in rural Malawi. World Bank Policy Research Working Paper, No. (5748).* Retrieved from

Cabeza-García, L., Del Brio, E. B., & Oscanoa-Victorio, M. L. (2019). Female financial inclusion and its impacts on inclusive economic development. *Women's Studies International Forum, 77*, 102300. https://doi.org/10.1016/j.wsif.2019.102300

Chliova, M., Brinckmann, J., & Rosenbusch, N. (2015). Is microcredit a blessing for the poor? A meta-analysis examining development outcomes and contextual considerations. *Journal of Business Venturing, 30*(3), 467-487. https://doi.org/10.1016/j.jbusvent.2014.10.003

Dabla-Norris, E., Yan, J., Townsend, R. M., & Unsal, F. D. (2015). *Financial deepening, growth, and inequality: A structural framework for developing countries. IMF Working Paper, International Monetary Fund.* Retrieved from https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Identifying-Constraints-to-Financial-Inclusion-and-Their-Impact-on-GDP-and-Inequality-A-42649

Duvendack, M., Palmer-Jones, R., Copestake, J. G., Hooper, L., Loke, Y., & Rao, N. (2011). *What is the evidence of the impact of micro finance on the well-being of poor people? EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.* Retrieved from https://www.givedirectly.org/wp-ontent/uploads/2019/06/DFID_microfinance_evidence_review.pdf

El-Zoghbi, M., Holle, N., & Soursourian, M. (2019). *Emerging evidence on financial inclusion. Consultative Group to Assist the Poorest (CGAP) Report, Focus Note, CGAP, World Bank.* Retrieved from https://www.cgap.org/sites/default/files/publications/2019_07_FocusNote_Emerging_Evidence.pdf

Emara, N., & El Said, A. (2021). Financial inclusion and economic growth: The role of governance in selected MENA countries. *International Review of Economics & Finance, 75*, 34-54. https://doi.org/10.1016/j.iref.2021.03.014

Ghosh, S. (2011). Does financial outreach engender economic growth? Evidence from Indian states. *Journal of Indian Business Research, 3*(2), 74-99. https://doi.org/10.1108/17554191111132206

Global Financial Inclusion (Global Findex) Database. (2017). *The World Bank/Microdata library/ Central Data Catalog / GLOBAL-FINDEX / WLD_2017_FINDEX_V02_M.* Retrieved from https://microdata.worldbank.org/index.php/catalog/3324

Gutiérrez-Romero, R., & Ahamed, M. (2021). COVID-19 response needs to broaden financial inclusion to curb the rise in poverty. *World Development, 138*, 105229. https://doi.org/10.1016/j.worlddev.2020.105229

Hassan, M. K., Sanchez, B., & Yu, J.-S. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance, 51*(1), 88-104. https://doi.org/10.1016/j.qref.2010.09.001

Huang, R., Kale, S., Paramati, S. R., & Taghizadeh-Hesary, F. (2021). The nexus between financial inclusion and economic development: Comparison of old and new EU member countries. *Economic Analysis and Policy, 69*, 1-15. https://doi.org/10.1016/j.eap.2020.10.007

Inoue, T., & Hamori, S. (2016). Financial access and economic growth: Evidence from Sub-Saharan Africa. *Emerging Markets Finance and Trade, 52*(3), 743-753. https://doi.org/10.1080/1540496x.2016.1116282

Jong-Hee, K. (2016). A study on the effect of financial inclusion on the relationship between income inequality and economic growth. *Emerging Markets Finance and Trade, 52*(2), 498-512. https://doi.org/10.1080/1540496x.2016.1110467

Kara, A., Zhou, H., & Zhou, Y. (2021). Achieving the United Nations' sustainable development goals through financial inclusion: A systematic literature review of access to finance across the globe. *International Review of Financial Analysis, 77*, 101833. https://doi.org/10.1016/j.irfa.2021.101833

Karim, Z. A., Nizam, R., Law, S. H., & Hassan, M. K. (2022). Does financial inclusiveness affect economic growth? new evidence Using a dynamic panel threshold regression. *Finance Research Letters, 46*, 102364. https://doi.org/10.1016/j.frl.2021.102364

Khan, H. (2011). *Financial inclusion and financial stability: Are they two sides of the same coin? Address by Shri H R Khan, Deputy Governor, Reserve Bank of India. BIS Central Bankers' Speeches.* Retrieved from https://www.bis.org/review/r111229f.pdf

Kim, D. W., Yu, J. S., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance, 43*, 1-14. https://doi.org/10.1016/j.ribaf.2017.07.178

Kim, J.-H. (2016). A study on the effect of financial inclusion on the relationship between income inequality and economic growth. *Emerging Markets Finance and Trade, 52*(2), 498-512. https://doi.org/10.1080/1540496x.2016.1110467

Klapper, L., & Singer, D. (2015). The role of informal financial services in Africa. *Journal of African Economies, 24*(suppl_1), i12-i31. https://doi.org/10.1093/jae/eju027

Lenka, S. K., & Sharma, R. (2017). Does financial inclusion spur economic growth in India? *The Journal of Developing Areas, 51*(3), 215-228. https://doi.org/10.1353/jda.2017.0069

Marcelin, I., Egbendewe, A. Y., Oloufade, D. K., & Sun, W. (2022). Financial inclusion, bank ownership, and economy performance: Evidence from developing countries. *Finance Research Letters, 46*, 102322. https://doi.org/10.1016/j.frl.2021.102322

Moore, W., & Craigwell, R. (2003). The relationship between commercial banks' interest rates and loan sizes: evidence from a small open economy. *Applied Financial Economics, 13*(4), 257-266. https://doi.org/10.1080/09603100110116434

Natamba, B., Mangeni, P., Nakabuye, Z., Brendah, A., & Agasha, E. (2013). Transaction costs and outreach of micro finance institutions in Uganda. *Issues in Business Management and Economics, 1*(6), 125-132.

NealL, D. (1990). *The rise of financial capitalism: International capital markets in the age of reason.* Cambridge, UK: Cambridge University Press.

Nguyen, H. M., Le, Q. T.-T., Ho, C. M., Nguyen, T. C., & Vo, D. H. (2022). Does financial development matter for economic growth in the emerging markets? *Borsa Istanbul Review, 22*(4), 688-698. https://doi.org/10.1016/j.bir.2021.10.004

North, D. (1990). *Institutions, institutional change, and economic performance.* UK: Cambridge University Press.

Omar, M. A., & Inaba, K. (2020). Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. *Journal of Economic Structures, 9*(1), 1-25. https://doi.org/10.1186/s40008-020-00214-4

Omojolaibi, J. A. (2017). Financial inclusion, governance and economic progress in Nigeria: What happens to the welfare of the poor. *Arabian Journal of Business and Management Review (Oman Chapter), 6*(7), 72-85. https://doi.org/10.12816/0036845

Park, C.-Y., & Mercado Jr, R. (2018). Financial inclusion, poverty, and income inequality. *The Singapore Economic Review, 63*(01), 185-206. https://doi.org/10.1142/s0217590818410059

Pearce, D. (2011). *Financial inclusion in the middle East and North Africa: Analysis and roadmap recommendations.* World Bank Policy Research Working Paper, No. 5610.

Rasheed, B., Law, S.-H., Chin, L., & Habibullah, M. S. (2016). The role of financial inclusion in financial development: International evidence. *Abasyn University Journal of Social Sciences, 9*(2), 330-348.

Samargandi, N., Fidrmuc, J., & Ghosh, S. (2015). Is the relationship between financial development and economic growth monotonic? Evidence from a sample of middle-income countries. *World Development, 68*, 66-81. https://doi.org/10.1016/j.worlddev.2014.11.010

Sarma, M. (2012). *Index of Financial Inclusion- A measure of financial sector inclusiveness. Berlin Working Papers No. 07/2012 on Money, Finance, Trade and Development.* Retrieved from https://finance-and-trade.htw-berlin.de/fileadmin/HTW/Forschung/Money_Finance_Trade_Development/working_paper_series/wp_07_2012_Sarma_Index-of-Financial-Inclusion.pdf

Serrao, M. V., Sequeira, A., & Hans, B. (2012). Designing a methodology to investigate accessibility and impact of financial inclusion. *Household Finance E-Journal-CMBO*, 1-14. http://dx.doi.org/10.2139/ssrn.2025521

Sethi, D., & Acharya, D. (2018). Financial inclusion and economic growth linkage: Some cross country evidence. *Journal of Financial Economic Policy*, *10*(3), 369-385. https://doi.org/10.1108/jfep-11-2016-0073

The Global Findex Database. (2021). *The world bank.* Retrieved from https://www.worldbank.org/en/publication/globalfindex/Data

Younas, Z. I., Qureshi, A., & Saleh, A.-F. M. A. (2022). Financial inclusion, the shadow economy and economic growth in developing economies. *Structural Change and Economic Dynamics*, *62*, 613-621. https://doi.org/10.1016/j.strueco.2022.03.011

Appendix A. List of developing countries included in the sample.

Low income countries
Burkina Faso, Burundi, Central African Republic, Chad, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Madagascar, Mali, Mozambique, Niger, Rwanda, Sierra Leone, South Sudan, Sudan, Tajikistan, Togo, Uganda.
Lower-middle income countries
Algeria, Angola, Bangladesh, Benin, Bhutan, Bolivia, Cabo Verde, Cambodia, Cameroon, Comoros, Congo, Cote d'Ivoire, Egypt, El Salvador, Eswatini, Ghana, Honduras, India, Kenya, Kiribati, Kyrgyz Republic, Lao PDR, Lesotho, Mauritania, Micronesia, Moldova, Mongolia, Morocco, Myanmar, Nepal, Nicaragua, Nigeria, Pakistan, Philippines, Senegal, Solomon Islands, Sri Lanka, Tanzania, Timor-Leste, Tunisia, Ukraine, Uzbekistan, Vanuatu, West Bank and Gaza, Zambia, Zimbabwe.
Upper-middle income countries
Albania, Argentina, Armenia, Azerbaijan, Belarus, Belize, Botswana, Brazil, Bulgaria, Colombia, Costa Rica, Dominican Republic, Ecuador, Equatorial Guinea, Fiji, Georgia, Guatemala, Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Malaysia, Maldives, Marshall Islands, Mexico, Montenegro, Namibia, North Macedonia, Paraguay, Peru, Russian Federation, Serbia, South Africa, Suriname, Thailand, Tonga, Turkey, Venezuela.

Appendix B. Composite financial inclusion index (FII). (Constructed for all, but only scores of developing countries are reported).

SL	Country	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
1	Afghanistan	0.094	0.148	0.149	0.151	0.670	0.671	0.602	0.601	0.608	0.605	0.609	0.610	0.611	0.610	0.612	0.613
2	Albania	0.693	0.725	0.764	0.788	0.830	0.838	0.851	0.858	0.865	0.862	0.864	0.862	0.941	0.926	0.916	0.920
3	Algeria	0.816	0.778	0.782	0.789	0.791	0.782	0.788	0.794	0.798	0.800	0.800	0.802	0.799	0.798	0.802	0.807
4	Angola	0.733	0.736	0.743	0.749	0.756	0.765	0.774	0.783	0.792	0.697	0.704	0.708	0.710	0.721	0.714	0.646
5	Argentina	0.805	0.828	0.844	0.863	0.879	0.890	0.900	0.913	0.925	0.934	0.937	0.940	0.944	0.946	0.948	0.949
6	Armenia	0.710	0.737	0.760	0.824	0.857	0.857	0.888	0.926	0.957	0.973	0.987	0.990	0.992	0.993	0.996	0.998
7	Azerbaijan	0.828	0.748	0.752	0.781	0.799	0.777	0.803	0.834	0.869	0.905	0.916	0.894	0.890	0.888	0.887	0.887
8	Bangladesh	0.840	0.841	0.842	0.841	0.843	0.844	0.851	0.857	0.860	0.863	0.866	0.872	0.875	0.879	0.883	0.887
9	Belarus	0.776	0.793	0.806	0.828	0.840	0.848	0.858	0.864	0.872	0.879	0.883	0.706	0.705	0.706	0.704	0.705
10	Belize	0.864	0.885	0.946	0.953	0.959	0.964	0.964	0.943	0.939	0.932	0.934	0.929	0.937	0.925	0.933	0.922
11	Benin	0.849	0.841	0.839	0.825	0.924	0.923	0.886	0.838	0.822	0.867	0.854	0.821	0.828	0.730	0.741	0.737
12	Bhutan	0.731	0.689	0.694	0.704	0.719	0.732	0.783	0.820	0.741	0.840	0.859	0.873	0.885	0.887	0.946	0.960
13	Bolivia	0.814	0.811	0.823	0.778	0.750	0.770	0.789	0.818	0.829	0.841	0.851	0.861	0.920	0.926	0.930	0.934
14	Bosnia and Herzegovinian	0.804	0.817	0.812	0.896	0.909	0.924	0.917	0.923	0.926	0.929	0.931	0.932	0.930	0.929	0.929	0.929
15	Botswana	0.911	0.916	0.926	0.956	0.960	0.961	0.952	0.940	0.937	0.933	0.938	0.943	0.930	0.949	0.951	0.961
16	Brazil	0.875	0.916	0.920	0.908	0.920	0.938	0.948	0.949	0.961	0.963	0.973	0.973	0.973	0.974	0.975	0.975
17	Bulgaria	0.830	0.902	0.922	0.932	0.935	0.934	0.931	0.929	0.931	0.931	0.932	0.931	0.930	0.930	0.933	0.944
18	Burkina Faso	0.828	0.828	0.828	0.983	0.982	0.988	0.869	0.869	0.867	0.878	0.761	0.761	0.756	0.761	0.759	0.755
19	Burundi	0.606	0.608	0.612	0.696	0.702	0.713	0.719	0.723	0.732	0.735	0.746	0.743	0.726	0.828	0.828	0.828
20	Cabo Verde	0.775	0.784	0.802	0.825	0.843	0.853	0.862	0.867	0.860	0.858	0.880	0.888	0.888	0.888	0.894	0.899
21	Cambodia	0.828	0.729	0.733	0.735	0.653	0.659	0.664	0.789	0.794	0.799	0.808	0.816	0.825	0.833	0.842	0.852
22	Cameroon	0.760	0.760	0.764	0.767	0.769	0.610	0.732	0.624	0.629	0.634	0.748	0.751	0.753	0.754	0.762	0.828
23	Central African rep.	0.730	0.667	0.668	0.671	0.627	0.629	0.632	0.635	0.636	0.639	0.607	0.607	0.616	0.612	0.828	0.828
24	Chad	0.730	0.730	0.730	0.730	0.668	0.731	0.669	0.670	0.670	0.600	0.599	0.601	0.603	0.602	0.605	0.601
25	China	0.828	0.828	0.705	0.714	0.725	0.738	0.752	0.766	0.906	0.917	0.924	0.933	0.935	0.936	0.999	0.998
26	Colombia	0.858	0.876	0.895	0.898	0.934	0.915	0.920	0.922	0.935	0.941	0.941	0.942	0.941	0.942	0.944	0.945
27	Comoros	0.674	0.741	0.738	0.744	0.785	0.804	0.724	0.739	0.738	0.738	0.735	0.735	0.726	0.726	0.719	0.721
28	Congo, Democratic Republic	0.734	0.734	0.729	0.737	0.737	0.629	0.596	0.606	0.613	0.614	0.616	0.623	0.605	0.606	0.608	0.828
29	Congo, rep.	0.670	0.671	0.672	0.675	0.630	0.634	0.637	0.640	0.643	0.676	0.701	0.708	0.703	0.706	0.828	0.828
30	Costa Rica	0.905	0.933	0.959	0.967	0.964	0.967	0.966	0.972	0.973	0.980	0.983	0.982	0.985	0.987	0.990	0.989
31	Cote d'Ivoire	0.828	0.828	0.828	0.828	0.828	0.828	0.746	0.749	0.748	0.754	0.758	0.759	0.759	0.760	0.759	0.756
32	Djibouti	0.733	0.733	0.734	0.734	0.606	0.615	0.623	0.626	0.632	0.667	0.683	0.699	0.668	0.690	0.674	0.675
33	Dominica	0.809	0.815	0.815	0.803	0.815	0.854	0.841	0.873	0.872	0.877	0.874	0.866	0.862	0.855	0.854	0.850

SL	Country	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
34	Dominican Republic	0.917	0.933	0.899	0.914	0.920	0.926	0.932	0.940	0.936	0.944	0.951	0.963	0.966	0.966	0.965	0.968
35	Egypt, Arab rep.	0.741	0.708	0.705	0.718	0.732	0.736	0.743	0.728	0.733	0.766	0.767	0.773	0.833	0.851	0.871	0.888
36	El Salvador	0.851	0.858	0.866	0.862	0.869	0.860	0.848	0.860	0.860	0.863	0.872	0.899	0.901	0.904	0.904	0.904
37	Equatorial Guinea	0.634	0.637	0.639	0.608	0.613	0.617	0.619	0.629	0.637	0.629	0.634	0.648	0.657	0.675	0.685	0.693
38	Eswatini	0.776	0.801	0.815	0.837	0.880	0.880	0.886	0.826	0.849	0.877	0.896	0.874	0.884	0.893	0.896	0.829
39	Ethiopia	0.729	0.779	0.710	0.714	0.712	0.720	0.721	0.726	0.727	0.829	0.829	0.829	0.829	0.829	0.829	0.829
40	Fiji	0.827	0.843	0.868	0.861	0.880	0.877	0.891	0.901	0.904	0.920	0.949	0.958	0.963	0.956	0.953	0.947
41	Gabon	0.829	0.629	0.635	0.640	0.652	0.655	0.664	0.674	0.702	0.799	0.829	0.829	0.829	0.829	0.829	0.829
42	Gambia	0.823	0.773	0.774	0.775	0.792	0.791	0.781	0.797	0.795	0.706	0.712	0.715	0.722	0.818	0.818	0.820
43	Georgia	0.695	0.731	0.801	0.874	0.913	0.920	0.932	0.940	0.949	0.942	0.946	0.947	0.948	0.948	0.947	0.948
44	Ghana	0.721	0.737	0.740	0.740	0.715	0.716	0.726	0.730	0.675	0.681	0.703	0.719	0.717	0.783	0.827	0.829
45	Grenada	0.849	0.854	0.856	0.862	0.868	0.871	0.875	0.873	0.855	0.870	0.843	0.861	0.867	0.864	0.868	0.870
46	Guatemala	0.796	0.830	0.855	0.879	0.891	0.890	0.893	0.898	0.908	0.912	0.915	0.914	0.915	0.915	0.911	0.911
47	Guinea	0.660	0.662	0.663	0.664	0.679	0.683	0.692	0.736	0.741	0.763	0.744	0.738	0.750	0.757	0.754	0.766
48	Guinea-Bissau	0.829	0.829	0.829	0.829	0.829	0.829	0.736	0.736	0.739	0.747	0.748	0.748	0.751	0.751	0.750	0.754
49	Guyana	0.756	0.763	0.751	0.768	0.793	0.802	0.810	0.822	0.825	0.828	0.829	0.833	0.834	0.836	0.833	0.838
50	Haiti	0.648	0.652	0.657	0.661	0.666	0.669	0.667	0.667	0.725	0.723	0.678	0.713	0.710	0.710	0.717	0.829
51	Honduras	0.779	0.785	0.790	0.821	0.822	0.844	0.847	0.872	0.886	0.887	0.892	0.898	0.899	0.899	0.901	0.903
52	India	0.855	0.812	0.815	0.821	0.828	0.831	0.844	0.846	0.852	0.859	0.874	0.881	0.886	0.893	0.895	0.899
53	Indonesia	0.801	0.807	0.807	0.837	0.857	0.865	0.871	0.885	0.901	0.912	0.918	0.940	0.940	0.954	0.952	0.952
54	Iran, Islamic rep.	0.977	0.870	0.886	0.905	0.920	0.935	0.959	0.971	0.984	0.989	0.989	0.991	0.990	0.987	0.984	0.829
55	Iraq	0.829	0.829	0.829	0.833	0.736	0.738	0.743	0.742	0.742	0.737	0.739	0.740	0.743	0.744	0.749	0.748
56	Jamaica	0.938	0.945	0.952	0.952	0.957	0.956	0.956	0.957	0.958	0.959	0.962	0.962	0.964	0.957	0.956	0.957
57	Jordan	0.823	0.826	0.829	0.826	0.827	0.837	0.821	0.820	0.820	0.817	0.812	0.810	0.823	0.830	0.827	0.828
58	Kazakhstan	0.772	0.791	0.808	0.856	0.880	0.884	0.888	0.890	0.891	0.892	0.893	0.892	0.893	0.893	0.894	0.894
59	Kenya	0.645	0.654	0.676	0.696	0.715	0.735	0.756	0.748	0.752	0.795	0.832	0.863	0.877	0.871	0.869	0.873
60	Kiribati	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.652	0.653	0.679	0.829	0.829	0.829	0.829	0.829	0.829
61	Kosovo	0.753	0.737	0.751	0.784	0.818	0.837	0.848	0.866	0.867	0.852	0.856	0.857	0.859	0.893	0.899	0.829
62	Kyrgyz republic	0.673	0.675	0.675	0.679	0.687	0.718	0.719	0.741	0.755	0.771	0.792	0.824	0.861	0.869	0.885	0.942
63	Lao PDR	0.829	0.829	0.829	0.829	0.741	0.691	0.701	0.709	0.717	0.708	0.728	0.729	0.734	0.742	0.745	0.829
64	Lebanon	0.846	0.888	0.901	0.913	0.924	0.930	0.933	0.933	0.933	0.929	0.926	0.925	0.923	0.925	0.927	0.927
65	Lesotho	0.681	0.706	0.716	0.728	0.690	0.696	0.683	0.699	0.695	0.719	0.732	0.713	0.718	0.729	0.737	0.829

66	Liberia	0.829	0.829	0.829	0.829	0.635	0.648	0.656	0.657	0.663	0.665	0.633	0.735	0.712	0.728	0.746	0.754
67	Libya	0.752	0.750	0.749	0.747	0.749	0.774	0.778	0.765	0.746	0.746	0.746	0.746	0.746	0.746	0.745	0.829
68	Madagascar	0.650	0.654	0.654	0.658	0.716	0.718	0.727	0.725	0.728	0.732	0.739	0.740	0.742	0.748	0.768	0.829
69	Malawi	0.636	0.636	0.639	0.650	0.644	0.654	0.658	0.680	0.677	0.677	0.648	0.682	0.745	0.719	0.726	0.720
70	Malaysia	0.883	0.883	0.884	0.910	0.913	0.923	0.924	0.923	0.923	0.944	0.942	0.942	0.940	0.939	0.938	0.937
71	Maldives	0.745	0.786	0.793	0.829	0.826	0.805	0.797	0.843	0.840	0.829	0.843	0.851	0.859	0.873	0.875	0.875
72	Mali	0.829	0.829	0.829	0.829	0.829	0.829	0.742	0.744	0.744	0.747	0.748	0.749	0.750	0.751	0.750	0.752
73	Marshall Islands	0.829	0.829	0.829	0.742	0.742	0.742	0.742	0.755	0.755	0.755	0.755	0.755	0.755	0.756	0.756	0.755
74	Mauritius	0.902	0.907	0.911	0.919	0.921	0.923	0.932	0.936	0.935	0.935	0.930	0.940	0.935	0.931	0.928	0.927
75	Mexico	0.846	0.853	0.865	0.872	0.901	0.906	0.917	0.908	0.918	0.922	0.924	0.926	0.932	0.930	0.936	0.939
76	Micronesia	0.715	0.716	0.717	0.715	0.713	0.720	0.747	0.749	0.767	0.766	0.767	0.754	0.750	0.747	0.745	0.746
77	Moldova	0.784	0.806	0.822	0.845	0.859	0.849	0.851	0.821	0.828	0.835	0.843	0.834	0.842	0.856	0.916	0.926
78	Mongolia	0.816	0.836	0.846	0.874	0.853	0.856	0.867	0.890	0.906	0.914	0.926	0.935	0.945	0.941	0.957	0.973
79	Montenegro	0.829	0.789	0.829	0.913	0.938	0.940	0.940	0.939	0.938	0.939	0.939	0.939	0.940	0.938	0.939	0.939
80	Morocco	0.831	0.848	0.845	0.854	0.862	0.812	0.818	0.826	0.834	0.840	0.847	0.881	0.888	0.892	0.894	0.896
81	Mozambique	0.680	0.643	0.651	0.686	0.693	0.709	0.719	0.740	0.755	0.773	0.786	0.805	0.821	0.820	0.824	0.826
82	Myanmar	0.650	0.651	0.651	0.651	0.651	0.651	0.652	0.651	0.624	0.643	0.658	0.674	0.704	0.719	0.779	0.863
83	Namibia	0.758	0.768	0.768	0.775	0.843	0.861	0.850	0.894	0.907	0.920	0.926	0.932	0.942	0.939	0.942	0.945
84	Nepal	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.839	0.812	0.822	0.831	0.837	0.841	0.849	0.861	0.872
85	Nicaragua	0.701	0.710	0.717	0.727	0.774	0.756	0.744	0.754	0.764	0.776	0.792	0.807	0.816	0.823	0.821	0.809
86	Niger	0.829	0.829	0.829	0.731	0.749	0.754	0.692	0.692	0.687	0.687	0.674	0.675	0.676	0.737	0.737	0.737
87	Nigeria	0.829	0.733	0.737	0.749	0.718	0.730	0.730	0.730	0.731	0.734	0.748	0.747	0.744	0.741	0.741	0.829
88	North Macedonia	0.740	0.715	0.800	0.889	0.961	0.961	0.963	0.962	0.959	0.959	0.958	0.959	0.958	0.955	0.954	0.956
89	Oman	0.824	0.830	0.836	0.843	0.850	0.854	0.881	0.884	0.881	0.885	0.878	0.877	0.877	0.882	0.879	0.829
90	Pakistan	0.660	0.665	0.676	0.692	0.696	0.697	0.700	0.702	0.709	0.717	0.730	0.742	0.753	0.763	0.782	0.788
91	Papua New Guinea	0.740	0.741	0.737	0.736	0.740	0.745	0.745	0.757	0.759	0.758	0.761	0.751	0.753	0.757	0.769	0.829
92	Paraguay	0.872	0.811	0.788	0.808	0.810	0.800	0.825	0.838	0.857	0.871	0.878	0.868	0.868	0.908	0.921	0.928
93	Peru	0.856	0.850	0.878	0.910	0.938	0.940	0.951	0.962	0.969	0.972	0.983	0.977	0.979	0.979	0.981	0.985
94	Philippines	0.846	0.853	0.859	0.860	0.866	0.869	0.875	0.884	0.885	0.897	0.901	0.908	0.915	0.919	0.925	0.926
95	Russian federation	0.796	0.819	0.846	0.871	0.888	0.893	0.893	0.892	0.892	0.892	0.892	0.892	0.892	0.892	0.892	0.892
96	Rwanda	0.587	0.706	0.701	0.666	0.705	0.751	0.770	0.785	0.794	0.800	0.806	0.806	0.806	0.805	0.818	0.839
97	Samoa	0.807	0.826	0.823	0.828	0.832	0.836	0.843	0.886	0.873	0.884	0.883	0.885	0.898	0.902	0.910	0.740
98	Sao tome and Principe	0.829	0.829	0.829	0.801	0.806	0.813	0.817	0.814	0.833	0.802	0.796	0.846	0.840	0.862	0.849	0.829
99	Senegal	0.829	0.829	0.829	0.829	0.829	0.829	0.747	0.750	0.751	0.751	0.752	0.754	0.754	0.754	0.754	0.756
100	Serbia	0.829	0.787	0.818	0.872	0.883	0.884	0.892	0.893	0.926	0.921	0.920	0.920	0.924	0.920	0.922	0.923

SL	Country	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
101	Sierra Leone	0.737	0.737	0.737	0.739	0.679	0.680	0.680	0.681	0.684	0.829	0.829	0.829	0.829	0.829	0.829	0.829
102	Solomon Islands	0.771	0.773	0.775	0.777	0.781	0.784	0.762	0.760	0.729	0.730	0.750	0.746	0.745	0.742	0.829	0.829
103	South Africa	0.911	0.915	0.929	0.941	0.960	0.971	0.977	0.982	0.991	0.993	0.992	0.990	0.987	0.987	0.986	0.988
104	South Sudan	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.591	0.592	0.594	0.598	0.599	0.601	0.598	0.597	0.600
105	Sri Lanka	0.919	0.917	0.921	0.849	0.861	0.870	0.880	0.890	0.895	0.929	0.929	0.930	0.829	0.829	0.829	0.829
106	St. Lucia	0.840	0.839	0.841	0.847	0.845	0.839	0.869	0.871	0.872	0.871	0.869	0.869	0.856	0.867	0.866	0.865
107	St. Vincent	0.812	0.812	0.815	0.827	0.826	0.822	0.829	0.829	0.809	0.844	0.843	0.849	0.851	0.853	0.852	0.851
108	Sudan	0.857	0.854	0.753	0.755	0.758	0.760	0.763	0.765	0.767	0.767	0.793	0.781	0.736	0.737	0.789	0.829
109	Suriname	0.760	0.764	0.780	0.787	0.790	0.797	0.776	0.775	0.778	0.778	0.784	0.944	0.945	0.947	0.946	0.963
110	Syrian Arab Republic	0.829	0.829	0.829	0.829	0.683	0.699	0.708	0.699	0.691	0.705	0.829	0.829	0.829	0.829	0.829	0.829
111	Tajikistan	0.733	0.679	0.697	0.716	0.722	0.715	0.720	0.736	0.750	0.768	0.770	0.763	0.758	0.760	0.765	0.829
112	Tanzania	0.829	0.829	0.646	0.662	0.634	0.637	0.644	0.654	0.655	0.654	0.792	0.660	0.829	0.829	0.829	0.829
113	Thailand	0.895	0.902	0.930	0.943	0.950	0.944	0.947	0.950	0.953	0.964	0.968	0.969	0.970	0.970	0.972	0.973
114	Timor-Leste	0.757	0.773	0.770	0.765	0.700	0.701	0.706	0.743	0.787	0.784	0.794	0.803	0.803	0.842	0.835	0.859
115	Togo	0.829	0.829	0.967	0.996	1.000	0.998	0.894	0.893	0.896	0.898	0.754	0.754	0.756	0.747	0.756	0.756
116	Tonga	0.908	0.931	0.896	0.886	0.900	0.895	0.889	0.890	0.890	0.912	0.897	0.856	0.872	0.887	0.876	0.829
117	Tunisia	0.751	0.869	0.884	0.894	0.900	0.905	0.913	0.920	0.850	0.856	0.862	0.868	0.873	0.877	0.878	0.875
118	Turkey	0.959	0.965	0.968	0.972	0.976	0.978	0.986	0.990	0.993	0.995	0.996	0.997	0.996	0.996	0.996	0.996
119	Uganda	0.688	0.701	0.705	0.707	0.710	0.715	0.646	0.652	0.643	0.646	0.648	0.670	0.676	0.684	0.729	0.737
120	Ukraine	0.810	0.875	0.888	0.905	0.917	0.918	0.919	0.921	0.922	0.921	0.922	0.921	0.921	0.922	0.922	0.922
121	Uzbekistan	0.627	0.636	0.654	0.668	0.681	0.687	0.715	0.716	0.730	0.744	0.754	0.776	0.816	0.842	0.867	0.903
122	Vanuatu	0.751	0.757	0.756	0.774	0.808	0.822	0.834	0.836	0.851	0.854	0.839	0.864	0.866	0.870	0.872	0.877
123	Venezuela, RB	0.829	0.847	0.874	0.892	0.895	0.897	0.904	0.905	0.906	0.905	0.901	0.904	0.829	0.829	0.829	0.829
124	Vietnam	0.738	0.744	0.747	0.765	0.782	0.793	0.803	0.841	0.856	0.864	0.874	0.882	0.890	0.890	0.899	0.903
125	West Bank and Gaza	0.829	0.829	0.764	0.774	0.797	0.792	0.802	0.827	0.835	0.839	0.845	0.851	0.859	0.859	0.869	0.879
126	Yemen, Rep.	0.732	0.735	0.686	0.693	0.698	0.698	0.682	0.684	0.693	0.701	0.709	0.706	0.829	0.829	0.829	0.829
127	Zambia	0.699	0.703	0.709	0.720	0.742	0.708	0.679	0.719	0.738	0.760	0.766	0.760	0.758	0.762	0.770	0.762
128	Zimbabwe	0.779	0.757	0.718	0.695	0.687	0.702	0.716	0.733	0.763	0.782	0.772	0.780	0.781	0.803	0.874	0.860