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Measuring Financial Inclusion Index for Developing Countries

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ABSTRACT

This research focuses on the multifaceted realm of financial inclusion within Developing Countries. It unfolds a meticulous exploration by formulating a financial inclusion index based on data extracted from a sample comprising 75 Developing Countries, spanning the period from 2010 to 2018. The index's creation comprises of two distinct stages. In stage one, a principal component analysis is applied to derive sub-indices encapsulating the dimensions of access, utilization of financial services, technological advancements, and infrastructure, drawing from an array of 24 financial indicators. Subsequently, the second stage normalizes values within each dimension, culminating in an overall index through the application of the Euclidean Formula. The findings of this study emphasized the pivotal role of a National Financial Inclusion Strategy in enhancing financial inclusion in each respective country. Customization of these strategies to align with specific economic goals of each nation is paramount. Central to these objectives are primary priorities, which diverge among countries. Notably, countries like Romania, Serbia, and Mauritius place a premium on fostering financial literacy, while others such as Pakistan, Costa Rica, Rwanda, and Guinea emphasize the growth of Small and Medium Enterprises. In contrast, nations like Guatemala, Mauritania, Thailand, and Ukraine concentrate on expanding their financial networks. Furthermore, countries grappling with low levels of financial inclusion attribute this challenge to factors such as deficient financial literacy, the absence of a well-defined financial inclusion strategy, financial constraints, a preference for traditional financial services, and limited awareness surrounding digital innovations. Conversely, nations boasting moderate levels of financial inclusion, yet not progressing towards higher levels, point to the dearth of technological innovation and restricted prudential measures as pivotal stumbling blocks. This comprehensive analysis underscores the necessity of dynamic strategies tailored to individual countries to achieve robust financial inclusion on a global scale.

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1. Introduction

Financial Inclusion, as defined by the World Bank Group, signifies the unrestricted access of consumers and entrepreneurs to a range of financial products that cater to their various needs. It poses a challenge for policymakers to provide affordable solutions, ensuring access for everyone, including those in impoverished and underserved regions. Access to financial resources not only facilitates daily transactions but also promotes savings culture. According to Global Findex Database 2021, 76% of adults hold financial accounts, while a significant 1.4 billion adults remain excluded. Notably, developing countries grapple with a 6 % gender gap in account ownership, accentuating the need for enhanced financial inclusion for women. Many nations with robust financial inclusion have implemented initiatives such as government payment transfers into bank accounts, mobile financial accounts, innovative e-commerce models, and national financial inclusion strategies (NFIS). NFIS, regarded as guidelines and action frameworks at the sub-national and national levels, aim to achieve predefined objectives, ultimately fostering sustainable financial inclusion. Notable countries that have implemented NFIS include Pakistan, Peru, Paraguay, Ethiopia, Haiti, and Mozambique, all striving to promote financial reforms and stability. This study focuses on key innovation players in the financial landscape: digital banks, Fintech startups, and platforms, shedding light on their transformative impact, including scalability, cost-efficiency, operational capabilities, and personalized financial experiences. Three financial inclusion models are explored: fully digital retail banks, banking as a service, and marketplace banks, each offering unique advantages.

Addressing the pressing challenge of poverty in developing countries, this research underscores the importance of raising the living standards of impoverished populations by granting them access to financial services. The study's central objective is to estimate the Financial Inclusion Index, providing insights into the struggles of developing nations in achieving financial inclusion targets. Additionally, it investigates whether current economic policies align with the goal of financial inclusion. While this study seeks to expand the criteria of dimensions and financial indicators to match contemporary needs, it acknowledges limitations, such as data availability, and assigns equal weight to available indicators to construct sub-indices. Financial inclusion, often wrongly perceived as a single-focused process, requires a broader perspective, emphasizing the consistent use of financial services. In summary, this study encompasses sections on literature review, research methodology, research analysis, policy recommendations, and conclusion, aiming to contribute to the discourse on enhancing financial inclusion in developing countries.

High poverty level is a major challenge of developing countries. To overcome this challenge, it is essential to raise the standards of living of poor people. The problem of poverty can potentially be alleviated through the provision of access to finance to poor people (Lee, Morduch, Ravindran, Shonchoy, & Zaman, 2021). For this purpose, the expansion of financial access to underserved areas is the main objective for developing countries. This study estimates the Financial Inclusion Index to analyze the struggles of developing countries to achieve the targets of financial inclusion. Furthermore, this study explores the policy perspectives that help to promote financial inclusion.

2. Literature Review

Several studies have contributed to our understanding of financial inclusion through the development of multidimensional indices. Cámara and Tuesta (2014) introduced an index encompassing dimensions of access, barriers, and usage, measuring the Demand-Supply Gap across 82 countries. This index revealed a positive correlation with GDP per Capita but a negative correlation with net interest margin and financial stability. Neha and Rao (2021) examined financial inclusion as a quasi-public good in India, utilizing a modified Human Development Index. Their study incorporated various variables such as deposit accounts, minimum savings amounts, and document requirements for account openings. Yorulmaz (2013) constructed a Financial Inclusion Index for Turkey, drawing on variables like the number of bank and ATM outlets per 1000 people. Ambarkhane, Singh, and Venkataramani (2016) explored the Financial Inclusion Index for India, covering aspects from financial literacy to infrastructure, along with demand and supply-side dimensions. Sethy (2016) delved into the relationship between inclusive growth and the Financial Inclusion Index in India, using dimensions related to banking penetration and access to financial services. Okpara (2013) employed the Financial Access Survey to estimate the Chi-Wins Financial Inclusion Index, focusing on rural banks in India. Meanwhile, UNDP-inspired indicators such as account numbers, banking services, and ATM availability were used to assess financial inclusion in India. Sriram and Sundaram (2015) investigated financial inclusion in four Tamil Nadu districts, revealing barriers related to income, financial knowledge, documentation complexity, and guidance.

Piñeyro (2013) examines financial inclusion in Mexican municipalities through 20 indicators, incorporating factors like access, usage, financial literacy, and consumer protection. Notably, this study introduced consumer protection as a dimension in the Financial Inclusion Index. In this context, our study differentiates itself by focusing on critical dimensions of financial inclusion, including access points, usage of financial services, communication technology, and infrastructure. We particularly emphasize financial consistency, which involves the circulation of debit and credit cards. Furthermore, communication technology covers internet services, mobile subscriptions, and other relevant aspects. The infrastructure dimension includes the requisite technologies associated with financial access.

Table 1

Fully Digital Retail Business	**Banking-as-a-Services**	**Marketplace Banks**
Target Customers: Individuals and MSMEs	Target Customers: Digital Consumer Companies Licensed FSPs, Unlicensed Fintech Companies.	Target Customers: Retail (MSME) Customers (front end) and Back End External Financial Service Providers as one provider/ multiple providers per product.
Services: Application-based interface and payments instruments transactional account with other services including Credit, Insurance and Saving, etc.	Services: Balance sheet, Banking License, and Cloud-Based System	Services: Financial Accounts, Application-based interface, comparison tools, and financial advice.
Value Proposition: Variety of Banking Service, Efficient Customer Service, and Customized experiences.	Value Proposition: Combination of Banking License and Technology, Easy entry for customers and Integrated E-Commerce	Value Proposition: Front End Customers OSS for advance ranged banking services. E-Commerce Integration and contextual banking. Provision of financial advice and Comparison tool services. Back End Financial Service Providers. The facility of the new market segment Cost-effective delivery channel Greater access to customer information
Revenue Model: Intermediation margin, fee, and charges.	Revenue Model: Individual Pay per use fee Share of Product-Level Revenue Monthly subscription Risk Underwriting	Revenue Model: Business to Customers (Core Services' Revenue) Business to business (referral commission and subscription model)
Business Logic: Calling operational cost through automated and limited infrastructure. Free digital payments in accounts Transactional information help cross-sell product Gaining higher margins	Business Logic Specialization in regulations and technology Technology stack Achieving Economies of Scale	Business Logic: Marketing Client Acquisition Other Services of Core Product Customers Loyalty
Dependencies: Regulations and Licensed Criteria like traditional banks. Using external agencies for infrastructure instead of own resources. Sometimes require partners to operate.	Dependencies Integration of Technical Solution Require Banking License	Dependencies: The combination of Core and 3rd Party Payments Integration of non-financial Services
Example: Tymebank (South Africa)	Example:	Example: Starling Bank (United Kingdom)

This literature review underscores the evolving landscape of financial inclusion, which extends beyond traditional dimensions to incorporate contemporary facets of access and technology, providing a comprehensive view of this critical economic phenomenon.

3. Data and Variables

Financial inclusion is a pressing concern for policymakers. This study assesses it in developing countries using a Financial Inclusion Index that covers dimensions like access, resource usage, technology, infrastructure, and provision. Current financial inclusion efforts often prioritize urgent needs through ATMs and bank branches, yet these have limitations and require consistent use. Technology, including mobile and internet services, accelerates inclusion, though the Index may underestimate due to limited digital innovation consideration. In today's era, providing diverse technologies that facilitate multipurpose use of financial services, including managing multiple accounts, is crucial compared to relying solely on branch-based accounts. Quality infrastructure plays a pivotal role in expanding financial access points, especially in underserved areas such as rural and unbanked regions.

Table 2: Financial Inclusion Index and its Sub-indices

S.No.	Sub-Indices	Financial Indicators
1	Availability of Financial Access	• Number of commercial bank branches per 100,000 adults. • Number of ATMs per 100,000 adults • Number of commercial bank branches per 1,000 km2 • Number of ATMs per 1,000 km2
2	Usage of Financial Resources	• Number of deposit accounts with commercial banks per 1,000 adults • Number of borrowers from commercial banks per 1,000 adults • Outstanding loans from commercial banks • Number of loan accounts with commercial banks per 1,000 adults • Number of depositors with commercial banks per 1,000 adults • Number of credit cards per 1,000 adults • Number of debit cards per 1,000 adults • Outstanding deposits with commercial banks • Domestic credit provided by the financial sector (% of GDP) • Gross domestic savings (% of GDP)
3	Technology	• Secure Internet servers (per 1 million people) • Mobile cellular subscriptions (per 100 people) • Fixed broadband subscriptions (per 100 people) • Individuals using the Internet (% of the population)
4	Infrastructure	• Quality of port infrastructure • Logistics performance index • Public-private partnerships • investment in transport (current US$) • Machinery and transport equipment (% of value-added in manufacturing) • Railways, goods transported (million ton-km)

Afghanistan, Albania, Algeria, Angola, Argentina, Armenia, Armenia, Bangladesh, Belize, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, Bulgaria, Cameroon, Chad, Chile, China, Colombia, Comoros, Comoros, Costa Rica, Djibouti, Dominican, Ecuador, Egypt, Georgia, Ghana, Guatemala, Guinea, Honduras, India, Indonesia, Kazakhstan, Kenya, Kyrgyz, Kyrgyz, Lao, Latvia, Lebanon, Lesotho, Lithuania, Madagascar, Malaysia, Maldives, Mauritania, Mauritius, Moldova, Montenegro, Myanmar, Namibia, Nicaragua, Nicaragua, Nigeria, Pakistan, Paraguay, Peru, Romania, Russian Federation, Rwanda, Samoa, Serbia, Seychelles, Solomon Islands South Sudan, Sudan, Sweden, Sweden, Switzerland, Thailand, Timor-Leste, Turkey, Uganda, Ukraine, Uzbekistan, Zambia, Zimbabwe.

4. Research Methodology

Financial Inclusion Index is measured through related variables financial inclusion mention in the form of dimensions in this study. Two critical concerns justified for estimation of the index are selection criteria of variables and weight assign for estimation of parameters. The assigning of weight may vary from country to country within each dimension due to lack of data for estimation of the Ideal value of the Financial Inclusion Index. The weight is also assigned to each dimension as the best Index estimation is based on extracting information from all variables but keeping the biases at their minimum level. In the estimation of the Indexing strategy, the choice of using sub-indices is used to check whether or not the variables within each dimension are correlated. The first stage is an estimation of principal component analysis computed for each dimension. The second stage is practicing normalization of values of each dimension and finally, the estimation of an overall index based on given dimensions. After the estimation of dimensions from Principal Component Analysis Approach, next is using the estimation method for the normalization of values is written as:

$$D_i = \frac{Actual\ Value_i - Minimum\ Value_i}{Maximum\ Value_i - Minimum\ Value_i} \quad (1)$$

The above formula creates the range (0<D_i< 1) for dimensional Index. The formula for estimation of the overall index is written as:

$$FII = 1 - \frac{\sqrt{(1-D_1)^2+(1-D_2)^2+(1-D_3)^2+(1-D_4)^2}}{\sqrt{n}} \quad (2)$$

The two-point dimensions' range is defined in value 0 (worst) to 1 (best). The above formula computes the inverse normalized value for estimation of the overall index of financial inclusion.

4.1. First Stage: Estimation of Principal Component Analysis for Dimensions

The step is an estimation of dimension for obtaining the new four endogenous variables associated with each dimension of the index and parameters of the equation is undernoted as:

$$D_i^A = \theta_1 ATM_{km2i} + \theta_2 Branch_{km2i} + \theta_3 ATM_{Popi} + \theta_4 Branch_{Popi} + \in_i \quad (3)$$

$$D_i^U = \gamma_1 Deposit\ Account_i + \gamma_2 Borrowers_i + \gamma_3 Outstanding\ Loan_i + \gamma_4 Loan\ Account_i + \gamma_5 Depositors_i + \gamma_6 Credit\ Cards_i + \gamma_7 Debit\ Cards_i + \gamma_8 Outstanding\ Deposits_i + \gamma_9 Domestic\ Credit_i + \gamma_{10} Gross\ Saving_i + v_i \quad (4)$$

$$D_i^T = \eta_1 Server_i + \eta_2 Mobile\ Cellular_i + \eta_3 Broadband_i + \eta_4 Internet\ Users_i + \Psi_i \quad (5)$$

$$D_i^I = \lambda_1 Quality_i + \lambda_2 Logistics_i + \lambda_3 Air_i + \lambda_4 Inv_i + \lambda_5 Transport_i + \lambda_5 Railway_i + \Omega_i \quad (6)$$

Let $M_Q(Q * Q)$ refers to the correlation matrix for indicators associated with each dimension. The symbol $\varphi(k = 1 \ldots \ldots .. q)$ taken as K^{th} eigenvalue script K refers to the number of Principal Component along with the number of indicators (Sub-indices) is the eigenvalue of the correlation matrix. On that basis of the assumption $\varphi_1 > \varphi_2 > \varphi_3 \ldots \ldots \ldots \ldots . \varphi_q$ and refer as $R_N = (N = 1 \ldots \ldots . q)$ the q^{th} Principle Component. The weighted average of an estimator of a single dimension is understated as:

$$D_i^u = \frac{\sum_{K,n=1}^{Q} \varphi_k^U R_{ni}^U}{\sum_{K,n=1}^{Q} \varphi_k^U} \quad (7)$$

$$D_i^A = \frac{\sum_{K,n=1}^{Q} \varphi_k^A R_{ni}^A}{\sum_{K,n=1}^{Q} \varphi_k^A} \quad (8)$$

$$D_i^T = \frac{\sum_{K,n=1}^{Q} \varphi_k^T R_{ni}^T}{\sum_{K,n=1}^{Q} \varphi_k^T} \quad (9)$$

$$D_i^I = \frac{\sum_{K,n=1}^{Q} \varphi_k^I R_{ni}^I}{\sum_{K,n=1}^{Q} \varphi_k^I} \quad (10)$$

Where $R_{ni} = v\varphi_k$ φ_k denote as a variance of n^{th} Principal Component (weight), ν is the indicators matrix. The Component's weight indicating is decreasing due to thoroughly explain the large variation in first Principal Component in q dimensional dataset of correlated variables. The first Principal Components presents extensive information from initial data. The dataset is preparing a set of dimensions to gains the first Principal Components.

4.2 Second Stage: Euclidian Distance formula for estimation of Financial Inclusion Index

In this study, four dimensions are estimated for developing the overall index. The formula for normalization of values is written as:

$$D_i^A = \frac{Actual_A - Min_A}{Max_A - Min_A} \quad (11)$$

$$D_i^U = \frac{Actual_U - Min_U}{Max_U - Min_U} \quad (12)$$

$$D_i^T = \frac{Actual_T - Min_T}{Max_T - Min_T} \quad (13)$$

$$D_i^I = \frac{Actual_I - Min_I}{Max_I - Min_I} \quad (14)$$

Here "i" denotes a country while (D_i^A, D_i^U, D_i^T and D_i^I) refers to access, usage of financial services, technology, and infrastructure. Therefore, the Normalized Inverse Euclidian Distance is estimated as:

$$FII = 1 - \frac{\sqrt{(1-D_i^A)^2+(1-D_i^U)^2+(1-D_i^T)^2+(1-D_i^I)^2}}{\sqrt{n}} \quad (15)$$

Financial Inclusion Index is divided into three categories as under:

- Range 0 - 0.3 value of index represents Low Financial Inclusion (LFI)
- Range 0.4 – 0.7 value of index represent Medium Financial Inclusion (MFI)
- Range 0.7 – 1 value of index represent High Financial Inclusion (HFI)

5. Research Analysis

In this section, the research analysis is divided into three categories are countries having low financial inclusion, countries progress towards medium-term financial inclusion, and the last category is countries progress towards High financial inclusion. Table 3 represents the countries with low financial inclusion and Table 4 represents those countries' progress towards high financial inclusion, and Table 5 represents the trend progress towards high financial inclusion. The countries' struggle towards the achievement of financial inclusion goals is discussed later in this section.

5.1. Low Financial Inclusion Countries

According to Aii (2020), Belize's financial inclusion is hindered by unreliable information, difficult-to-use ATMs and point of sale networks. The Central Bank of Belize is working to improve disaggregated data to create more opportunities. In Punatar (2019) find that a lack of appropriate financial tools for entrepreneurs, high fees and lengthy documentation for opening business accounts, and low financial literacy contribute to a higher inclusion gap. Lithuania is still in its early stages of financial inclusion despite numerous Fintech companies established over time, but a regulatory framework has been introduced to promote progress (OECD, 2019). Malaysia has successfully achieved financial inclusion through its master plan (2001-2010) and continued growth in the area (Luna-Martínez et al., 2017). However, Mauritius struggles with financial consistency among its population due to low financial knowledge and maintenance of accounts, with over half failing to maintain balances (MOLOȘAG, 2016).

Table 3: Trend in Financial Inclusion (Countries with Low Financial Inclusion)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018
Belize	LFI	LFI	LFI	LFI	LFI	LFI	LFI	LFI	LFI
Chile	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI	LFI
Lithuania	LFI	LFI	LFI	LFI	LFI	LFI	LFI	MFI	LFI
Malaysia	LFI	MFI	MFI	MFI	MFI	LFI	LFI	LFI	LFI
Mauritius	LFI	LFI	MFI	MFI	LFI	MFI	MFI	MFI	LFI
Moldova	LFI	LFI	MFI	MFI	MFI	LFI	LFI	LFI	LFI
Nigeria	LFI	LFI	LFI	MFI	MFI	MFI	MFI	LFI	LFI
Romania	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	LFI
Serbia	LFI	LFI	LFI	LFI	LFI	LFI	LFI	LFI	LFI
Sweden	LFI	LFI	LFI	LFI	LFI	MFI	MFI	LFI	LFI
Switzerland	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI	LFI
Uganda	LFI	LFI	LFI	LFI	LFI	LFI	LFI	LFI	LFI
Ukraine	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	LFI
Zimbabwe	LFI	LFI	MFI	MFI	MFI	LFI	LFI	LFI	LFI

In Nigeria, the Community based Microcredit Program has helped to increase financial access for the financially excluded population, which comprises 46.3% of the country (Kama & Adigun, 2013). Romania faces significant economic challenges, with 35.7% of the population living below the poverty level and 40% having no financial account. In Serbia, low financial and educational attainment for the poorest 40% contribute to the underuse of digital services, and people often pay their utility bills through the Serbian Post (Nendovic & Golicin, 2015).

5.2. Medium Financial Inclusion Countries

According to Ghafori (2019),**Error! Reference source not found.** approximately 85 P ercent of the population lies under unbanked areas in Afghanistan, while 50 Percent of the population lives under the poverty line. Douma, Bettioui, and Bendob (2019) find that the strategy to promote financial inclusion in Algeria focused on the development of the Microfinance Sector. For this purpose, the Microfinance Lending Policy was introduced for financial companies, low-income customers for Retail Banks, and cooperative financial networks.

Table 4: Trend in Financial Inclusion (Countries progress towards Medium Financial Inclusion)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018
Afghanistan	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI	MFI
Albania	LFI	LFI	MFI	MFI	MFI	HFI	HFI	MFI	LFI
Algeria	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI	MFI
Angola	LFI	LFI	MFI	LFI	MFI	MFI	MFI	MFI	MFI
Armenia	LFI	LFI	MFI	MFI	MFI	HFI	HFI	MFI	MFI
Bhutan	LFI	LFI	LFI	LFI	MFI	LFI	MFI	MFI	MFI
Bolivia	LFI	LFI	LFI	MFI	LFI	MFI	MFI	MFI	MFI
Bosnia and Herzegovina	LFI	LFI	MFI	HFI	HFI	MFI	MFI	MFI	MFI
Botswana	LFI	LFI	LFI	MFI	LFI	MFI	LFI	MFI	MFI
Brazil	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Bulgaria	LFI	LFI	LFI	LFI	MFI	MFI	LFI	MFI	MFI
Central African Rep.	LFI	LFI	MFI	HFI	MFI	MFI	MFI	MFI	MFI
Chad	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI	MFI
Costa Rica	LFI	LFI	LFI	MFI	MFI	MFI	MFI	LFI	MFI
Dominican Rep.	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Ecuador	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Georgia	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI	MFI
Ghana	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI	MFI
Guatemala	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Honduras	LFI	MFI	MFI	MFI	MFI	MFI	MFI	MFI	MFI
Kazakhstan	MFI	MFI	MFI	MFI	MFI	LFI	MFI	MFI	LFI
Kenya	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI
Kyrgyz Rep.	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Lao	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI
Latvia	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Lebanon	LFI	LFI	LFI	MFI	LFI	LFI	LFI	LFI	MFI
Lesotho	LFI	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI
Madagascar	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI
Mauritania	LFI	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI
Montenegro	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Myanmar	LFI	LFI	LFI	LFI	LFI	MFI	HFI	HFI	MFI
Namibia	LFI	LFI	LFI	LFI	MFI	MFI	HFI	MFI	MFI
Nicaragua	LFI	LFI	LFI	LFI	MFI	LFI	MFI	HFI	MFI
Pakistan	LFI	LFI	LFI	MFI	MFI	HFI	MFI	HFI	MFI
Russian Federation	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Samoa	LFI	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI
South Sudan	LFI	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI
Sudan	LFI	LFI	MFI	LFI	LFI	LFI	LFI	MFI	MFI
Thailand	LFI	LFI	LFI	MFI	MFI	MFI	MFI	MFI	MFI
Uzbekistan,	LFI	LFI	LFI	LFI	MFI	LFI	LFI	MFI	MFI

Deloitte (2013) identifies that in Angola, financial literacy is on the rise among adults through various campaigns supported by financial institutions. These initiatives include the introduction of new products and services, along with highlighting the associated benefits of their usage. In 2012, only 20 Percent of the population had formal bank accounts which gradually enhanced by taking actions on improving the customer service quality.

According to AFI (2020), Financial Capability Assessment Project (FCAP) is desired to bolster the financial stability program and National Strategy of Financial Education (NSFE) in Armenia. It is essential to provide a road map of actions including threshold, strategies, and priority to evaluate the effectiveness of strategy consistently. Niang (2013) conclude that women play a significant role in the expansion of financial inclusion in Bhutan because of their willingness to adopt the new technology than males. Bhutan National Bank Limited has 25 banking branches to serve rural areas and has a dedicated scheme that provides loans without any collateral requirement for poor people. Roa, Villegas, and Garrón (2019) states that the Bolivian economy has direct access to credit policy to promote financial inclusion. The transaction cost in saving products is quite low while challenges persist in lending due to asymmetric information.

IMF (2015) reported that 40 Percent of adults had no formal accounts in Bosnia and Herzegovina. In 2014, this country had 963 bank branches which reflects branch banking as the main channel for financial inclusion while the use of internet banking is not prevalent. Mogomotsi and Madigela (2016) conclude that the Botswana Government used the Grameen Bank model of Bangladesh to reduce its poverty level, which indirectly enhanced the financial inclusion of this economy. Brazil achieved the progress of financial inclusion through the implementation of the regulatory framework (GPFI, 2011). The initiatives of prudent measures to stabilize the banking sector enabled more than 150,000 banking agents with regulatory environments. Filipova-Rivers (2016)**Error! Reference source not found.** concludes that the focus on financial literacy was b ehind financial inclusion progress in Bulgaria. Financial literacy surveys, financial education, dispute resolution, professional competence, disclosure of information, and consumer awareness can potentially help in improving financial literacy. Muhoza and Muriu (2018) suggest that the barriers of financial inclusion in Central Africa are family ownership, trust in financial institutions, documentation process for account opening, and distant location of financial institutions and higher cost of account opening. Djimoudjiel (2018) claim that the post-financial inclusion era in Chad started in 2009.

Chadian banks recapitalized to reduce risks, but despite improvements, financial development in Chad is minimally affected during the mass banking period marked by inherent customer risks. The Central Bank of Costa Rica estimates that around 90 percent of the population is using mobile phones with internet services, and half of the non-cash transactions are completed through contactless bank cards (Sunel, 2020). In Dominica, the national financial inclusion strategy is established to increase access to financial goals along with the effective provision of credit through electronic payment (Villarreal, 2017). For this purpose, the Dominic Republic payment and settlement system was introduced in 2009. Samaniego and Tejerina (2010) find that the conditional cash transfer policy in Ecuador is contributing to the promotion of financial inclusion in rural areas. The option card allows the transfer of funds through an ATM without any cost. 75 Percent of the beneficiaries own a card or provided with a card to facilitate electronic payment for poor people. According to Babych, Grigolia, and Keshelava (2018) Georgian population has basic financial knowledge, and while the decision-making process of smart financial behavior includes the use of financial products, savings, and expenditure planning. Financial products that are used in general transactions are bank loans, small shop loans, current accounts, and installments which people relate to their finances. Nearly 41 Percent of the population do not have any financial goals. Belnye (2011) highlights that wide variety of financial access has revolutionized the choice and pattern of consumption and saving. The informal financial intermediaries play their role to increase financial access to poor people living in rural as well as urban areas under significant branch network growth in Ghana.

Pereda L.F.Q. (2019) reports that in Guatemala, 56 Percent of adults do not have an account in 2017, 27 Percent of adults do their digital financial transactions, and 16 percent only receive payments. The National Financial Inclusion Strategy is focused on the integration of international practices in the financial system. According to the Honduras National financial inclusion strategy, the farmer group suffers the most from financial exclusion. The unpredictable nature of their income is a barrier to financial inclusion. The findings of Kapparov (2018) suggest that after reviving from the effects of the financial crisis in 2008, Kazakhstan's economy focused on promoting financial inclusion. For this purpose, Government introduced the "Concept for the financial sector development of the Republic of Kazakhstan until 2030 (2030 concept)". It was envisioned to make persistent progress through promoting financial education programs at all state levels including through the broadcasting media for financial awareness. According to GPFI (2011) financial inclusion in Kenya is showing its great performance in digital innovation. The non-bank financial institution is playing a dominant role to promote financial inclusion. For instance, M Pesa mobile banking is increasing the expansion of the financial system. Like other countries, Kyrgyz also focuses on financial literacy to achieve financial inclusion development. Hasanova (2018) state that the Central Bank of Kyrgyz introduced prudential measures to supervise the banking irregularities which results in mobilization of saving and structured finance markets, but the vulnerabilities, political instability, poor institutions, and higher poverty rate hindered d the progress towards financial inclusion. Morgan and Long (2020) argued that financial literacy is an important link to promote financial inclusion as the person having financial knowledge tends to save more and utilize their funds in formal institutions in Laos. The rural people mostly save informally because of lack of knowledge and poor access to resources. OECD (2016) highlighted that the financial structure of Latvia is small with limited local demand for global finance services. The banking sector has a 90 percent share of the financial system. The strong regulatory environment is monitored through Consumer Rights and Protection Centre. Clark (2016) claim that the financial intermediation in Lebanon is at its peak considered as an offshore center. The progress of financial inclusion is seemingly not satisfactory for the design framework of the National Financial Inclusion Strategy due to political instability. Mobile money services play a pivotal role in advancing financial inclusion in Lesotho. Policymakers focus on the growth of mobile money in the business environment.

Rakoto (2018) explores that the economy of Madagascar has a financial mechanism of mobile money and microcredit system to promote financial inclusion.. There are three modes of payments i.e. mobile banking, mobile money transfer, and mobile payments in the country. Meanwhile microcredit offers insurance, deposit, and loan facilities. Amendola, Boccia, Mele, and Sensini (2016) emphasize that the preference of household credit for investment in education implies denser integration, higher living standards, and food security in Mauritania. According to Jaeger, Rouillon, and Abrahams (2016) prudential measures are weakening in Montenegro, where the banking network is mostly the subsidiary of international banks. To address this issue, Financial Sector Assessment Program (FSAP) has been established to stabilize the financial sector in Montenegro. UNDP (2014) highlights that the National Financial Inclusion Strategy in Myanmar has an objective in poverty reduction from 26 percent to 16 percent. Therefore, eight development tasks are initiated, including credit saving, cooperative tasks, and credit enterprises. Financial inclusion in Myanmar has faced challenges of high informal sector, restricted finance, limited infrastructure, financial constraints, and poor regulations along with other economic challenges such as traditional monetary system, weak institutions, and absence of rural-based models.

Meanwhile, Popovic (2016) concludes that the financial structure in Namibia is well developed compared to other South African Countries. 60 Percent of the population have formal bank accounts. That said, the access to finance at the enterprise level is limited as compared to individual households. The reason for lower access to finance is the lack of collateral for small and medium enterprises. The assessment of financial structure in Nicaragua has remained low. In 2010, many microfinance institutions failed due to bankruptcy. Subsequently, initiatives were taken for microfinance programs in rural areas. In a study conducted by Ali, Khalid, and Khalid (2012), **Error! Reference source not found.** the authors argued that Pakistan has initiated an a ction plan for prosperous growth of financial inclusion. The significance of financial inclusion is underscored by its inverse relationship with poverty levels. Pakistan National Financial Inclusion Strategy was developed in 2015 to promote financial inclusion. The reason behind the slow progress is the sluggish growth of the private sector, poor business environment, gender inequality, and large informal economy. The unbanked population has declined by 0.3 million people because of the implementation of the inclusion strategy, but the gap is almost double between the rural and urban sectors. r. Like other countries, banks are a major contribution to financial inclusion in Russia (GORSHKOV, 2017). The banking sector is concerned about the growth of the MSME sector to invest in the agriculture sector.

ADB (2019) identifies that the financial sector in Samoa is based on 30 licensed financial enterprises, and the insurance sector is still underdeveloped. The credit supply has reported a perpetual growth of 11 percent per year. Despite this, the financial exclusion stands at65 Percent of the adults. In case of South Sudan, **Error! Reference source not found.** the financial s tructure of country has 28 banks and ten microfinance institutions (Bank of South Sudan, 2013). The financial sector is well developed for significant growth of financial inclusion in the economy, but this country requires NFIS to accelerate financial inclusion for the vulnerable sector of society. Ariyapruchya et al. (2019) argues that in Thailand, the economy started to achieve sustainable to achieving sustainable growth in 2019. New technologies are revolutionizing financial services and helping in increasing the coverage of banking in Uzbekistan (Ahunov, 2018). With over 88 percent Muslim population, there is a huge gap of Islamic Banking System, as people avoid using conventional products. The common barriers of financial inclusion are religious reasons, lack of trust, costly financial products, distant locations,

5.3. High Financial Inclusion Countries

Repetto and Denes (2010) report that in Argentina, the financial system is required with Institutional Diversity, greater access, reduction of unitary cost, and accountability in financial institutions. As for Bangladesh, Akter (2016) argue that financial inclusion is a concerning issue for Bangladesh to achieve its progress in financial inclusion with a successful story of Grameen Bank to serve the poor sector. The coverage of financial access to a larger proportion is the objective of financial inclusion while the common financial barriers are high fee cost, accessibility for the formal market, and lack of financial literacy. Mafoosa (2019)**Error! Reference source n ot found.** find that mobile money banking in Cameroon is the result of progress in financial inclusion.. The reduction in the cost of mobile can create significant improvement in mobile money banking influence on the choice of financial resilience. Yang and Zhang (2020) explore that the financial development of China is the renaissance of the financial industry through great progress in microenterprises. The advanced development of digital innovation and integration of financial technology revolutionizes society with new reforms. Thoene and Turriago-Hoyos (2017) investigate that in Colombia, financial inclusion Inter Sector Commission in Colombia is the reason behind significant progress. Colombian Congress has introduced Law 1735 regarding financial inclusion regulation and its public policies. The individual preferences for internet banking are increasing due to the provision of greater access for mobile money-driven financial inclusion.

The analysis of Dabysing (2019) highlight that the economic condition of Comoros is facing many economic challenges due to political instability in the country. Besides this poor supervision of the banking sector is the barrier to financial inclusion. The policy objective is to promote financial inclusion through supporting youth and women entrepreneurship geographically. Vakil (2018) claims that in Djibouti, the economy has a high potential for entrepreneurship because of demographic transition as bulk of the population is less than 35 years old. For this purpose, the policymakers should focus on entrepreneurship in Djibouti. Nasr, Helmy, and Ali (2018) argues that the remarkable performance of Egypt in the financial system is represented through the provision of 0.13 million mobile money agents along with 39 banks. 56.3 percent of adults use mobile banking in this country. The Government initiated debit and credit card technology and an automated clearinghouse for fast and reliable transfer of electronic payments to promote financial inclusion. Furthermore, the Central Bank of Egypt introduced several customers due-diligence measures for the prevention of Anti Money Laundering. ADF (2017) suggest that the economic challenges in Guinea are the existence of structural gaps for infrastructure development, weak financial structure, and limited private sector.

Garg and Agarwal (2014) concluded that lack of access to financial sector of low-income groups in India, is a barrier to economic progress. Approximately 35 percent of adults have formal accounts in India. Indian policy makers are focusing to enhance the access of the financial services through low-cost and efficient techniques. Rosengard and Prasetyantoko (2011)**Error! R eference source not found.** demonstrate that there is a lack of regulatory framework in Indonesia to overcome the barrier of financial inclusion. The Indonesian economy is considered the best global leader in the microfinance sector, but without regulation, this economy is facing a credit crunch. WBG (2019) highlight that in the Maldives Fintech revolutionized electronic payments by breaking the blockage of access to finance in the geographically dispersed country. There are remarkable changes seen in the mobile wallets with a sharp increase in the volume of transactions through RTGS.

Espinoza (2018)**Error! Reference source not found.** suggest that the reason behind t he success of Paraguay for achieving financial inclusion is progress in mobile financial services. In 2008, E-wallet introduced as a source of electronic money transfer achieved maximum coverage of financial services users. Paraguay earned third-best in the regulatory framework and seventh best in the supervision of electronic payments. In Peru, Ministry of Development and social inclusion (MIDIS) was established to introduce social programs to promote social inclusion (Gertler et al., 2016). Currently, government transfers are distributed through electronic payment informal accounts rather than cash in hand. Bigirimana and Hongyi (2018) explains that Rwanda remained focused to achieve 90 percent financial inclusion in the country. The

Government should continue to support the microfinance sector and provision of quality banking services for extensive coverage of the population.

Table 5: Trend in Financial Inclusion (Countries progress towards High Financial Inclusion)

Country	2010	2011	2012	2013	2014	2015	2016	2017	2018
Argentina	LFI	LFI	LFI	MFI	MFI	MFI	MFI	HFI	HFI
Bangladesh	LFI	LFI	LFI	LFI	MFI	MFI	HFI	HFI	HFI
Cameroon	LFI	LFI	LFI	LFI	LFI	MFI	HFI	HFI	HFI
China	LFI	LFI	LFI	LFI	LFI	LFI	MFI	MFI	HFI
Colombia	LFI	LFI	LFI	MFI	MFI	MFI	MFI	HFI	HFI
Comoros	LFI	LFI	LFI	MFI	MFI	HFI	HFI	HFI	HFI
Djibouti	LFI	LFI	LFI	LFI	LFI	MFI	MFI	HFI	HFI
Egypt	LFI	LFI	LFI	LFI	LFI	LFI	MFI	HFI	HFI
Guinea	LFI	LFI	LFI	LFI	LFI	LFI	LFI	HFI	HFI
India	LFI	LFI	LFI	LFI	MFI	MFI	MFI	HFI	HFI
Indonesia	LFI	LFI	LFI	LFI	MFI	LFI	MFI	MFI	HFI
Maldives	LFI	LFI	LFI	LFI	LFI	LFI	MFI	HFI	HFI
Paraguay	LFI	LFI	LFI	LFI	LFI	LFI	LFI	MFI	HFI
Peru	LFI	LFI	LFI	MFI	MFI	MFI	HFI	HFI	HFI
Rwanda	LFI	LFI	LFI	MFI	MFI	HFI	HFI	HFI	HFI
Seychelles	LFI	LFI	LFI	MFI	MFI	HFI	HFI	MFI	HFI
Solomon Islands	LFI	LFI	LFI	LFI	MFI	MFI	HFI	HFI	HFI
South Africa	LFI	LFI	LFI	LFI	HFI	HFI	HFI	HFI	MFI
Timor-Leste	LFI	LFI	LFI	MFI	MFI	HFI	HFI	HFI	HFI
Turkey	LFI	LFI	LFI	LFI	MFI	LFI	MFI	HFI	HFI
Zambia	LFI	LFI	LFI	LFI	MFI	MFI	MFI	HFI	HFI

Abel (2017) noted that the reforming of the financial sector starts from 2008, Seychelles Electronic Fund Transfer (SEFT) has an efficient system of electronic fund transfer from which the Government has initiated the electronic payment gateway. The challenges of financial inclusion are the poor structure of SMEs insufficient local market, lack of technical entrepreneurship skills, and lack of financial capability. Consumer protection is the supporting instrument of financial inclusion policies. Solomon Island has coverage of 50 Percent of the rural area to achieve the objective of financial inclusion. The key challenges of financial inclusion are lack of technology-based infrastructure, language barriers, agent network liquidity constraints; high coverage access has cover 80 Percent of the population have access to the alternate delivery channel. GPFI (2011) report that the South African economy created a financial sector charter to promote financial inclusion. The charter targets to fulfill certain financial access targets banking sector. The Government focuses more on financial inclusion beyond the Financial Charter.

Sousa (2017)**Error! Reference source not found.** suggest that the Timor-Leste take i nitiatives by presenting a report on financial inclusion in 2016. The bank played a significant role in the expansion of access points in financial services. In 2009, there were 45 financial access points which raised approximately 164 access points while ATM access points have reached from 16 to 64 access points. According to Terzi (2015), financial inclusion in Turkey has achieved its significant status due to well-developed small and medium enterprises. The microfinance sector helps to create employment opportunities and building the financial strength of the economy. However, the growth of the SME sector is at stake due to credit constraints. Chileshe (2019) explores that the financial inclusion process in Zambia is still struggling to achieve prosperous growth. Following strategies must be given priority in Zambia's Financial System:

- Development of efficient Insurance Sector.
- Design a framework and implement an action plan regarding the rural framework.
- Ensuring Regulatory Framework.
- Enhancing Macroeconomic Stability.

6. Conclusion

The research study constructs the index of financial inclusion for developing countries. The financial index evaluates the extent of financial inclusion for developing countries. For this purpose, this study uses Principal Component Analysis to estimate the sub-indices of the financial inclusion index while the overall index estimates through Euclidian Formula. The financial inclusion index is based on four dimensions is access, usage of financial services, technology, and infrastructure. This study finds out that the National Financial Inclusion Strategy is required for each country to achieve higher financial inclusion. The goals and objectives settled in the National Financial Inclusion Strategy are based on their respective economic planning. The major priority goals set for the National Financial Inclusion Strategy are an expansion of financial access points, including the branch network, development of Small and Medium Enterprises sector, and to achieve the highest level of financial literacy. However, the priority on implementing and achieving these goals varies from country to country. The countries, including Romania, Serbia, and Mauritius have set it as a priority goal to achieve financial literacy. On the other side, countries including Pakistan, Costa Rica, Rwanda and Guinea are giving priority to the development of Small and Medium Enterprises, whereas, countries that focus on the expansion of networks are Guatemala, Mauritania, Thailand, and Ukraine. The reason behind countries having low financial inclusion is lack of financial literacy, absence of financial inclusion strategy, other financial constraints, preference for the usage of financial services, and ignorance on digital innovation. The reason behind countries having medium financial inclusion and not progressing towards high financial inclusion is the lack of technological innovation and limited prudential measures.

6.1. Policy Recommendations

The policy recommendations extract from the analysis is undernoted as:

6.1.1. Agent Banking

In agent banking, the bank has agents to perform general stores. The agents must adept in POS banking.

6.1.2. Significance of Informal Sector

The informal sector plays a role in the provision of opportunities to people to express their problems and requirements of financial need for better participation in national issues.

6.1.3. Role of Government

Government should promote financial inclusion through investment in communication technologies, services, and infrastructure. Furthermore, the establishment of regulatory authorities resolved the bank-related issues to restore consumer protection and built their trust.

6.1.4. Effective Regulatory and Supervisory Framework

The effective strategies and efficient implementation enhance the accountability and transparency in access to finance for the provision of quality services to the vulnerable sector of the society.

6.1.5. Reduction in Cost/ Charges/ fees

one key success for financial institutions to stay in the business through the provision of high-quality products with low transaction costs.

6.1.6. Financial Literacy

Media is the fourth pillar of the state. The effective use of the power of Media to promote financial awareness creates influences on people's preference in the usage of financial services.

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