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Financial Inclusion Dynamics: A Cross-Country Examination of Bank Concentration and Policy Strategies

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Abstract

Financial inclusion, ensuring access to affordable financial products and services, is vital for economic development and poverty reduction. This study investigates the relationship between bank concentration, policy mix, and financial inclusion dynamics in developed and developing nations across 2014, 2017, and 2021. Utilizing financial inclusion as the dependent variable, factors such as bank concentration, fiscal freedom, monetary freedom, globalization, education, and urbanization are examined as independent determinants. Separate analyses for each country group enable cross-country comparisons and policy insights. The findings reveal a consistent hindrance to financial inclusion due to high bank concentration across all years and in both developing and developed countries, highlighting the critical need to diversify financial institutions for enhanced access. The impact of fiscal freedom shows shaded patterns, with a modestly negative effect in 2017 for developing nations, underscoring the necessity for tailored fiscal policies to actively promote inclusion. Monetary freedom positively influences financial inclusion in 2014 and 2017, diminishing by 2021. Globalization consistently fosters financial inclusion, though its significance fades in developed countries in 2021. Education emerges as a key driver, displaying a robust positive relationship across all years and countries. Urbanization's impact varies, with significant positive effects in 2017 but diminishing significance by 2021. Policymakers are urged to diversify financial institutions, tailor fiscal policies, and ensure monetary stability. Fostering globalization and strategic investments in education are identified as effective strategies for enhancing financial inclusion, with a call for adaptable, context-specific approaches to ensure inclusive economic growth.

Keywords: Financial Inclusion, Bank Concentration, Monetary and Fiscal Freedom, Globalization

JEL Codes: G21, O16, E44

1. Introduction

Financial inclusion, denoting universal access and effective utilization of formal financial services, such as savings accounts, loans, and insurance, plays a pivotal role in fostering economic growth, poverty alleviation, and social stability (Ali, 2015; Hussain, 2018; David et al., 2018; Audi et al., 2022). This imperative gained prominence in the early 2000s, prompting extensive research into its multifaceted impact. Recognized as vital

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for financial sector organizations to ensure stability and broaden access (Bozkurt et al., 2018; Siddiqi, 2018), financial inclusion acts as a catalyst in bridging wealth disparities and enhancing social stability (Raddatz, 2006; Hasan & Sadat, 2023; Namadi, 2023; Ali et al., 2023; Audi & Ali, 2023). The provision of diverse financial services and products enhances users' financial well-being (Beck et al., 2007; Asif & Simsek, 2018; Abigail, 2023), while an increase in bank deposits, facilitated by financial inclusion, stabilizes the banking sector, contributing to economic growth and poverty reduction (Han & Melecky, 2013; Maurya, 2018; Ustaoglu & Yildiz, 2023; Ali & Audi, 2023).

Various indices gauge the level of financial inclusion, reflecting its multidimensional nature (Sarma, 2008; Gupta & Venkataramani, 2012; Arora, 2014; Ali & Bibi, 2017Nudzor, 2023). Particularly critical in emerging economies, financial inclusion has assumed greater significance amid the COVID-19 pandemic, intensifying challenges in accessing formal financial services. In response, financial institutions explore innovative avenues like digital banking and mobile money services (IFC, 2021; Sayvaya & Phommason, 2023), while governments implement policies, including stimulus packages and cash transfer programs, to enhance accessibility globally. Bank concentration, the dominance of a few large banks in a market, emerges as a critical factor influencing financial inclusion. Its adverse effects, such as reduced competition and increased costs, disproportionately affect low-income individuals and small businesses, hindering efforts to promote financial inclusion. Recognizing this, strategies aimed at fostering financial inclusion must carefully consider the implications of bank concentration (Hasan et al., 2021; Gupta et al., 2020; Munir et al., 2023).

The policy mix, encompassing monetary, fiscal, and regulatory measures, is instrumental in advancing financial inclusion goals (Laeven and Valencia, 2012). Monetary policy influences credit availability and borrowing costs, shaping financial inclusion dynamics. Fiscal policy, through government spending and taxation, allocates resources to stimulate economic development and financial inclusion. Regulatory frameworks, including consumer protection laws and digital finance policies, enhance trust in the financial system. However, the effectiveness of these policies hinges on meticulous design, implementation, and alignment with country-specific contexts (Blanchard et al., 2010; Iqbal, 2018; Ali, 2018; Allen et al., 2014; Klapper et al., 2019; Ziong, 2024). Consequently, policymakers must ensure efficient implementation to maximize the impact on financial inclusion, supporting economic growth.

Despite their significance, the interplay between bank concentration and the policy mix and their collective impact on financial inclusion remains underexplored in existing literature. This study aims to fill this gap by examining these relationships and their implications. In addressing the broader problem of limited financial resources hindering economic growth, particularly in developing countries like Pakistan, the study aligns with the global push for sustainable development goals (Sahay et al., 2015; Demirguc-kunt & Klapper, 2013). Financial inclusion stands as a pivotal strategy for achieving these goals, with its benefits extending beyond individuals to impact families, neighbors, and the environment (Shyni & Mavoothu, 2014; Cizakca, 2024). Thus, the study's objective is to contribute valuable insights to inform policymakers and financial institutions in designing effective strategies to promote financial inclusion and advance sustainable development. The specific objectives include analyzing the impact of bank concentration and policy components on financial

inclusion among developed and developing nations (Allen et al., 2012; Beck & Torre, 2006; Camara & Tuesta, 2014; Karim & Said, 2024; Audi et al., 2024). Financial inclusion, crucial for equitable economic growth and Sustainable Development Goals, has garnered global attention. Despite extensive research on determinants like account ownership and technology access, factors such as bank concentration and policy mix remain understudied. This research filled this gap, providing insights for researchers, policymakers, and stakeholders, enriching the understanding of financial inclusion determinants and informing strategic decisions.

2. Literature Review

This part of the paper is comprised of literature review, most relevant and recent studies have been selected as literature review. Akudugu's (2013) study in Ghana identifies education, gender, age, income, location, and employment as significant factors impacting financial inclusion. In India, Chithra and Selvan (2013) find income, literacy, population, infrastructure, and banking variables significantly influencing financial inclusion. David et al. (2018) investigate Nigerian financial inclusion, revealing a positive relationship with GDP per capita, credit, and internet access. Wellalage et al. (2021) highlight the role of ICT in promoting financial inclusion for entrepreneurs in African countries. Sarma (2008) introduces a multidimensional financial inclusion index (IFI), emphasizing low levels in many economies, including industrial ones. Cámara and Tuesta (2014) create a global financial inclusion index, correlating it with macroeconomic variables like GDP per capita and education. Kumar (2013) explores financial engineering in India, stressing the impact of branch penetration on financial inclusion.

Several studies address the link between financial inclusion and economic growth. Hariharan and Marktanner (2012) find a positive impact, while in South Asia, emphasizing the mediating role of internal conflict settlement and underscore financial inclusion's positive influence on economic growth, particularly in developing countries. Mobile phone usage emerges as a significant factor in enhancing financial inclusion. Yorulmaz (2012) investigates financial inclusion, economic development, and human development in Turkey, highlighting the positive relationship. Fanta and Makina (2019) stress the role of ICT in promoting financial inclusion across 44 countries. Ngo (2019) analyzes Asian countries, revealing positive effects of infrastructure, particularly cell phone subscriptions, on financial inclusion. Sarma (2012) introduces the IFI, linking financial inclusion and income levels. Chinoda and Kwenda (2019) investigate mobile phones, economic growth, and stability on financial inclusion across 49 countries. Asuming et al. (2018) emphasize the importance of targeting key populations, such as women and young people, for financial inclusion.

Dangi and Kumar (2013) describe India's financial inclusion, highlighting RBI and GOI initiatives. Agarwal and Klapper (2013) discuss government policies, emphasizing the need for tailored strategies. Gupta et al. (2012) compute the Financial Inclusion Index, underscoring the role of geographical outreach and penetration in enhancing financial inclusion in India. In conclusion, the literature review encompasses studies from various regions, emphasizing the multifaceted determinants of financial inclusion, its impact on economic

growth, and the role of technological advancements. The findings contribute to a nuanced understanding of the complexities surrounding financial inclusion, offering valuable insights for policymakers, researchers, and stakeholders globally.

Financial inclusion, vital for economic growth and social development globally, aims to ensure universal access to financial services, regardless of economic status. The degree of bank concentration, wherein a few major institutions dominate a nation's financial sector, significantly influences financial inclusion. Chauvet and Jacolin (2017) reveal a positive correlation between financial inclusion and firm performance, with high bank concentration impeding inclusion. Saha and Dutta (2021) emphasize a U-shaped relationship between financial inclusion and stability, influenced by concentration and competition. Avom et al. (2022) find that bank concentration negatively affects financial inclusion in African economies, influenced by factors like financial freedom and mobile phone penetration. Reyad et al. (2022) show that higher bank competition and lower concentration contribute to financial fragility in Gulf Cooperation Council countries. Owen and Pereira (2018) challenge conventional wisdom, demonstrating that greater banking industry concentration correlates with increased access to deposit accounts and loans, emphasizing the importance of limited market power.

Babajide et al. (2015) assess financial inclusion penetration in Nigerian states, revealing variances and highlighting threats like job loss and hidden charges. Beck et al. (2007) provide a cross-country analysis, indicating that crises are less likely in economies with more concentrated banking systems. Kebede et al. (2021) establish that bank asset concentration and market power beyond thresholds hinder financial inclusion in African countries. Gopalan and Rajan (2022) examine the trade-off between digital financial inclusion and output stability, finding a positive relationship between digital inclusion and output volatility in EMDEs, particularly in countries with low banking concentration. Ajide (2017) explores the role of institutional infrastructure in financial inclusion for Sub-Saharan African countries, identifying both positive and negative impacts on various indicators. The discussion then shifts to financial inclusion and policy mix. Evans and Adeoye (2016) investigate determinants in Africa, finding positive impacts from economic growth, political stability, and telecommunications development, while inflation and remittance costs negatively affect financial inclusion.

Le et al. (2019) examine Asian countries, highlighting positive relations with economic growth, literacy, and income, but no significant correlation with population density and Islamic banking. Oleschak (2021) links financial inclusion to technology and monetary and fiscal policies, emphasizing the negative relationship between inflation and financial inclusion in developing countries. Mehrotra and Yetman (2014) analyze how financial inclusion affects welfare-maximizing monetary policy, concluding that a strong empirical analysis using cross-country data sets is necessary. Uddin and Chowdhury (2017) investigate determinants in Bangladesh, revealing that the size and efficiency of banks and literacy positively impact financial inclusion, while age dependency ratio has a negative association. Collectively, these studies emphasize the intricate relationships between bank concentration, policy mix, and financial inclusion, underscoring the importance of tailored strategies and interventions to foster inclusive financial systems globally.

3. Theoretical and conceptual links

This section of the study encompasses the theoretical and econometric methodology employed for empirical analysis. Finance, a crucial driver of economic growth, is instrumental in fostering technology-driven productivity and income growth (Ghosh et al., 1999; Nandru et al., 2016; Ibrahim & Rasheed, 2024; Rath, 2024). Aligned with the United Nations' Sustainable Development Goals, efforts globally have aimed at achieving equitable economic growth through enhanced access to diverse, affordable financial services (Collard, 2010; Leeladhar, 2005; Rangarajan, 2008). While numerous studies have scrutinized determinants like account ownership, saving behavior, and technological access, insufficient attention has been given to the roles of bank concentration, monetary policy, and fiscal policy in financial inclusion (Demirguc-Kunt and Klapper, 2013; Efobi et al., 2014; Iqbal & Abbas, 2024; Nino-Zarazua and Copestake, 2008).

Financial inclusion, extending beyond service access, acts as a catalyst for sustainable economic growth by reducing poverty, fostering job creation, and improving income distribution (Aterido et al., 2011; Quader, 2024). Inclusive financial systems empower individuals to access credit, invest, and save, enhancing investment and consumption. Moreover, financial inclusion bolsters stability by providing regulated services, mitigating the risk of financial crises.

The relationship between bank concentration and financial inclusion is illuminated by market structure and competition theory, positing that higher concentration diminishes competition, resulting in elevated prices and restricted service access (Berger and Humphrey, 1997; Claessens and Laeven, 2005). Policy mix and financial inclusion find theoretical support in monetary and fiscal policy theory, where policies impacting money supply, interest rates, government spending, and taxation influence credit availability and costs (Laeven and Valencia, 2012; Blanchard et al., 2010). Additionally, financial regulations and policies play a pivotal role in shaping financial inclusion (Allen et al., 2014; Klapper et al., 2019). Following Beck and de la Torre (2006), Stijin (2005), Boucher and Guirkinger (2007), and Beck et al. (2007), the conceptual model is outlined.
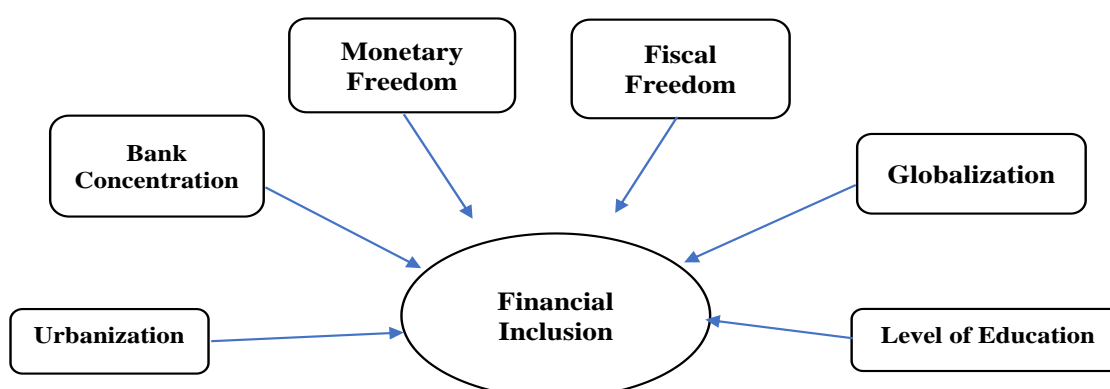
4. Econometric Methodology

For examining the coefficients of the selected variables, the econometric model can be written as:

$$FIN_i = \alpha + \beta_1 BANKC_i + \beta_2 FP_i + \beta_3 MP_i + \beta_4 GI_i + \beta_5 EDU_i + \beta_6 URB_i + e_i$$

Following the cross-sectional data set, this study uses a simple linear regression model for empirical analysis and Principal component analysis has been used for the construction of all indexes in the study, the basis transformation to diagonalized, and the determination of covariance of the data Xk, k = 1,…., 1,Xk $\varepsilon R^\wedge N$

$C = 1/1\sum \llbracket \times \rrbracket \_j \times \_j^\wedge T$ …………………………..

Kenral function for computing these products without performing actual maps Aizerman and Braverman 1964 for the same choices of the kernel it can be shown by the method of functional analysis that there exists a map into the same dot product.

$(X.Y)^\wedge 2 = (\times\_1^\wedge 2, \times\_(1,)$ $\times\_(1,)$ $\times\_2^\wedge 2)$ $\llbracket (y\_1^\wedge 2, y\_(1,)$ $y\_(2,)$ $y\_(1,)$ $y\_2^\wedge 2) \rrbracket ^\wedge T$ …………………….

4.1. Description of Variables

Financial Inclusion (FIN)

Principal component analysis (PCA) derived the financial inclusion index, which includes several key indicators such as the number of accounts held by individuals aged 15 and above, the percentage of individuals aged 15 and above who have borrowed from a financial institution, and the ownership percentages of credit and debit cards. Furthermore, it includes the percentage of people aged 15 and above with accounts at financial institutions, as well as those who have saved at these institutions. The World Development Indicator (WDI) provides the data for this index.

Bank Concentration (BANKC)

Examining the assets of the three largest commercial banks as a proportion of the total assets within the commercial banking sector allows us to calculate bank concentration. These assets include all earning assets, cash, and due from banks, foreclosed real estate, fixed assets, goodwill, other intangibles, tax assets, discontinued operations, and other assets. Bankscope and Orbis provide the raw data. The calculation involves summing the data for the three largest banks and dividing it by the sum for all banks, both in Bankscope and Orbis. The formula ensures that bank concentration reflects the share of assets held by the largest banks relative to the total.

Fiscal Freedom (FP)

We compute fiscal freedom scores using a quadratic cost function to account for the diminishing returns from very high tax rates. We scale the data for each fiscal factor to a 100-point scale. This method ensures that no single high corporate tax rate unduly influences the overall score. The OECD's official database serves as the source of data for fiscal freedom.

Monetary Freedom (MP)

Monetary freedom is a combination of price stability and price control assessment. This score is based on the

weighted average inflation rate over the past three years, as well as the extent of price controls. We calculate the monetary freedom score by considering recent inflation rates and deducting points based on the extent of price controls. We obtain data for monetary freedom from the OECD database.

Globalization (GI)

We assess globalization using the KOF Index of Globalization. This index measures the economic, social, and political dimensions of globalization. The official KOF database provides the data for the Globalization Index.

Education (EDU)

The level of secondary school enrollment measures the education variable. The World Development Indicator (WDI) sources this data, which represents the percentage of eligible students enrolled in secondary education.

Urbanization (URB)

The percentage of the urban population relative to the total population quantifies urbanization. This metric reflects a country's level of urban development. The World Development Indicator (WDI) also provides data for urbanization.

5. **Results and Discussions**

This section is comprised of estimated results and discussion, as this study is going to examine the impact of bank concentration and policy mix on financial inclusion among developed and developing countries for the years 2014, 2017, and 2021. To investigate the intertemporal properties of the data set, this study applied descriptive statistics. In 2014, developing countries displayed a moderate average financial inclusion score of 56.53, with notable variability (SD = 41.84). Bank concentration was moderately scored at 66.44, showing a relatively symmetric distribution. Fiscal freedom averaged 79.40, indicating a high degree of fiscal freedom with a symmetric distribution. Monetary freedom exhibited a left-skewed distribution (mean = 72.40), hinting at varying scores. Globalization averaged 60.01, demonstrating a moderately symmetric distribution. Education levels (mean = 0.5735) showcased moderate attainment with consistent distribution. Urbanization (mean = 55.70) indicated significant variability (SD = 25.05) in rates across countries. Despite slight deviations, Jarque-Bera tests generally supported normal distributions across variables, ensuring data reliability.

Table 1: Descriptive Statistics of Developing Countries for the year 2014

	FIN	BANKC	FP	MP	GI	EDU	URB
Mean	56.52539	66.43831	79.40333	72.39833	60.00769	0.573500	55.69783

Median	43.56319	63.74433	79.35000	74.15000	60.97507	0.610500	53.18950
Maximum	159.8102	100.0000	99.90000	87.10000	84.31502	0.871000	100.0000
Minimum	2.679787	23.02354	48.20000	0.000000	36.90694	0.189000	10.91500
Std. Dev.	41.83841	21.48311	10.25469	11.57548	10.14998	0.148101	25.04886
Skewness	0.927427	0.030102	-0.167049	-4.276742	-0.061590	-0.457416	0.064155
Kurtosis	2.996447	1.925466	3.514984	26.95307	2.683227	2.794783	1.958880
Jarque-Bera	8.601236	2.895621	0.942074	2.280	0.288795	2.197579	2.750983
Probability	0.113560	0.235084	0.624354	0.102202	0.865543	0.333274	0.252715
Sum	3391.524	3986.299	4764.200	4343.900	3600.461	34.41000	3341.870
Sum Sq. Dev.	103276.7	27229.92	6204.359	7905.510	6078.303	1.294099	37019.29
Observations	60	60	60	60	60	60	60

In 2017, developing countries displayed a mean financial inclusion score of 62.91, signifying a moderate level with considerable variability (SD = 40.77). The Jarque-Bera test indicated an approximate normal distribution (p = 0.0845). Bank concentration averaged 66.14, reflecting a moderate level, supported by a symmetric distribution (median = 63.81) and a Jarque-Bera p-value of 0.1743. Fiscal freedom scored 80.10 on average, suggesting a high degree with a symmetric distribution (median = 79.75, p = 0.9249). Monetary freedom, with a mean of 73.33, showed a slightly left-skewed distribution (kurtosis = 3.97, p = 0.0123). Globalization averaged 59.44, displaying moderate levels with a symmetric distribution (median = 59.54, p = 0.4425). Education mean was 0.5728, indicating moderate attainment with a symmetric distribution (median = 0.577, p = 0.5406). Urbanization averaged 55.60, showcasing variability (SD = 24.29) with a reasonably normal distribution (median = 53.31, p = 0.2595).

Table 2: Descriptive Statistics of Developing Countries for the year 2017

	FIN	BANKC	FP	MP	GI	EDU	URB
Mean	62.90821	66.14065	80.09545	73.33333	59.43605	0.572848	55.59518
Median	55.23674	63.81376	79.75000	74.95000	59.54136	0.577000	53.30550
Maximum	163.0560	100.0000	99.90000	88.30000	82.19077	0.879000	100.0000
Minimum	6.500780	22.59654	60.10000	49.70000	39.77837	0.217000	11.77600
Std. Dev.	40.77165	21.49617	8.791699	6.890737	10.29776	0.149770	24.29416
Skewness	0.639012	0.013332	0.107642	-0.751800	0.070900	-0.205078	0.068668
Kurtosis	2.595397	1.873182	2.897735	3.968229	2.243097	2.471753	2.019053
Jarque-Bera	4.941891	3.493682	0.156216	8.795272	1.630776	1.229999	2.698075
Probability	0.084505	0.174324	0.924865	0.012306	0.442468	0.540641	0.259490
Sum	4151.942	4365.283	5286.300	4840.000	3922.779	37.80800	3669.282
Sum Sq. Dev.	108051.3	30035.56	5024.109	3086.347	6892.846	1.458024	38363.39
Observations	66	66	66	66	66	66	66

In 2021, developing countries demonstrated a mean financial inclusion score of 78.23, signifying a high average level, with notable variability (SD = 38.24). The Jarque-Bera test indicated slight deviation (p = 0.0537), close to normality. Bank concentration had a mean score of 59.84, suggesting moderate concentration, with a symmetric distribution (median = 56.64). Fiscal freedom scored 79.56 on average, showing high fiscal freedom with a symmetric distribution. Monetary freedom, averaging 75.48, exhibited a left-skewed distribution. Globalization averaged 62.56, indicating moderate levels with a symmetric

distribution. Education levels, with a mean of 0.6253, and urbanization, averaging 59.08, showed relatively consistent distributions. Jarque-Bera tests supported normality in most variables, emphasizing patterns in these countries.

Table 3: Descriptive Statistics of Developing Countries for the year 2021

	FIN	BANKC	FP	MP	GI	EDU	URB
Mean	78.23370	59.84111	79.55962	75.47692	62.56053	0.625327	59.08438
Median	64.62510	56.64476	79.10000	76.60000	62.51966	0.642000	59.79950
Maximum	178.5678	92.67410	99.90000	86.70000	83.31577	0.879000	100.0000
Minimum	16.49841	17.04710	55.70000	50.90000	43.59484	0.332000	16.71400
Std. Dev.	38.23505	17.22147	9.886022	6.946451	9.350159	0.122675	24.47091
Skewness	0.814115	0.025554	-0.119315	-1.258541	0.059509	-0.152745	-0.131240
Kurtosis	2.781803	2.301615	2.980299	5.509288	2.379164	2.604114	1.909596
Jarque-Bera	5.847273	1.062433	0.124221	27.36984	0.865807	0.541776	2.725398
Probability	0.053738	0.587889	0.939779	0.000001	0.648623	0.762702	0.255969
Sum	4068.152	3111.738	4137.100	3924.800	3253.148	32.51700	3072.388
Sum Sq. Dev.	74557.87	15125.53	4984.405	2460.912	4458.700	0.767509	30540.10
Observations	52	52	52	52	52	52	52

The 2014 correlation matrix reveals insights into variable relationships. Financial Inclusion weakly correlates positively with Bank Concentration, suggesting a slight increase in bank concentration as financial inclusion rises. Fiscal Freedom shows weak positive correlations with Financial Inclusion and Monetary Freedom, indicating a potential link between fiscal policies and financial dynamics. Monetary Freedom moderately correlates positively with Bank Concentration and Fiscal Freedom, highlighting the interplay between monetary policies and banking sector concentration. Globalization strongly correlates positively with financial inclusion, education, and urbanization, reflecting their interconnectedness. Education exhibits strong positive correlations with financial inclusion and urbanization, emphasizing education's role in promoting financial access and urban development. Urbanization strongly correlates with financial inclusion, globalization, and education, emphasizing its role as a catalyst for these socio-economic factors. These findings suggest no significant multicollinearity among explanatory variables for regression analysis.

Table 4: Correlation Matrix of Developing Countries for the year 2014

Variables	FIN	BANKC	FP	MP	GI	EDU	URB
FIN	1.000000						
BANKC	0.132202	1.000000					
FP	0.223619*	-0.10205	1.000000				
MP	0.048775	0.204339	0.124687	1.000000			
GI	0.697138***	-0.05502	0.250052**	0.202070*	1.000000		
EDU	0.726721***	-0.06444	0.185408	0.015785	0.776337***	1.000000	
URB	0.623824***	0.041960	0.286144**	0.172293	0.751768***	0.744604***	1.000000
***, **,* represent significant 1 percent, 5 percent, and 10 percent respectively.							

The 2017 correlation matrix reveals a non-significant negative correlation between financial inclusion and

bank concentration. Fiscal freedom has a weak positive correlation, and monetary freedom shows a very weak positive correlation with financial inclusion. Globalization and level of education exhibit strong positive correlations, underscoring their impactful roles in enhancing financial access. Urbanization displays strong positive correlations with both financial inclusion and globalization, indicating higher financial inclusion and increased globalization in urban areas. These findings suggest minimal risk of multicollinearity in regression analysis due to low correlations among explanatory variables.

Table 5: Correlation Matrix of Developing Countries for the year 2017

Variables	FIN	BANKC	FP	MP	GI	EDU	URB
FIN	1.000000						
BANKC	-0.116325	1.000000					
FP	0.150078	0.080740	1.000000				
MP	0.157995	0.232219	0.048200	1.000000			
GI	0.710359***	-0.14457	0.160875	0.388562***	1.000000		
EDU	0.789759***	-0.1838*	0.101985	0.067698	0.74907***	1.000000	
URB	0.588450***	0.049309	0.22008**	0.174527	0.66626***	0.716969***	1.000000
***, **,* represent significant 1 percent, 5 percent, and 10 percent respectively.							

In the 2021 correlation matrix, financial inclusion exhibited a very weak positive correlation with bank concentration, which wasn't statistically significant. Fiscal freedom showed a very weak negative correlation with bank concentration, while monetary freedom displayed a very weak positive correlation. Globalization strongly correlated positively with financial inclusion, highlighting its significant impact. Education and urbanization both demonstrated strong positive correlations with financial inclusion, emphasizing their roles. Additionally, urbanization showed strong positive correlations with various socioeconomic factors, including bank concentration, fiscal freedom, monetary freedom, globalization, level of education, and financial inclusion. These results indicate no high correlation among explanatory variables, mitigating multicollinearity concerns in regression analysis.

Table 6: Correlation Matrix of Developing Countries for the year 2021

Variables	FIN	BANKC	FP	MP	GI	EDU	URB
FIN	1.000000						
BANKC	0.107786	1.000000					
FP	0.041288	-0.198816	1.000000				
MP	0.252152*	0.117712	0.094215	1.000000			
GI	0.679750***	0.068963	0.199902	0.492422***	1.000000		
EDU	0.692452***	0.036410	0.061610	0.156353	0.742171***	1.000000	
URB	0.499070***	0.238968*	0.165054	0.203726	0.727808***	0.731275***	1.000000
***, **,* represent significant 1 percent, 5 percent, and 10 percent respectively.							

In 2014, the least-squares analysis for developing countries reveals a significant negative association between bank concentration and financial inclusion. A unit increase in bank concentration corresponds to a noteworthy 0.2978 unit decrease in financial inclusion, maintaining significance at the 1%, 5%, and 10% levels.

Conversely, fiscal freedom shows a minimal impact on financial inclusion, lacking statistical significance at any level. Meanwhile, higher monetary freedom correlates positively with increased financial inclusion, with a 0.0262 unit rise for each monetary freedom unit, remaining significant at all levels. Globalization exhibits a weak positive link, statistically significant at the 10% level. Education displays a robust positive relationship, indicating a 1.6699 unit increase in financial inclusion for each unit rise in education, highly significant at all levels. In contrast, urbanization suggests a weak positive link without statistical significance at any level, suggesting limited direct impact on financial inclusion in developing countries.

Table 7: Least Square Outcomes of Developing Countries for the year 2014

Dependent Variable: FIN				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
BANKC	-0.297818	0.127201	-2.341327	0.0282
FP	-0.000145	0.003922	-0.036853	0.9709
MP	0.026209	0.011238	2.332290	0.0288
GI	0.018769	0.010012	1.874668	0.0736
EDU	1.669940	0.552619	3.021866	0.0061
URB	0.003746	0.002961	1.264990	0.2185
C	2.574216	1.518591	1.695134	0.1035
R-squared	0.684156	Mean dependent var		4.933663
Adjusted R-squared	0.601762	S.D. dependent var		0.276374
S.E. of regression	0.174409	Akaike info criterion		-0.453868
Sum squared resid	0.699623	Schwarz criterion		-0.126922
Log likelihood	13.80802	Hannan-Quinn criter.		-0.349275
F-statistic	8.303473	Durbin-Watson stat		1.958204
Prob(F-statistic)	0.000075			

The least-square analysis of developing countries in 2017 reveals critical insights. Higher bank concentration significantly and substantially hampers financial inclusion, reducing it by approximately 0.5422 units per unit increase, with high statistical significance at the 1 percent level (p = 0.0100). Fiscal freedom exhibits a weak negative association, leading to a decrease of about 0.0147 units for each unit increase, significant at the 10 percent level (p = 0.0794). Conversely, monetary freedom shows a weak positive correlation, increasing financial inclusion by approximately 0.0192 units per unit rise, significant at the 10 percent level (p = 0.0546). Globalization strongly and significantly associates with increased financial inclusion, rising by about 0.0363 units per unit increase, highly significant at the 1 percent level (p = 0.0002). Urbanization demonstrates a significant positive relationship, with an increase of about 0.0097 units per unit rise, significant at the 1 percent level (p = 0.0152). However, the level of education indicates a weak positive link without statistical significance (p = 0.8348).

Table 8: Least Square Outcomes of Developing Countries for the year 2017

Dependent Variable: FIN				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
BANKC	-0.542199	0.203501	-2.664351	0.0100
FP	-0.014729	0.008249	-1.785548	0.0794
MP	0.019201	0.009786	1.962026	0.0546
GI	0.036332	0.009109	3.988515	0.0002
EDU	0.048731	0.232585	0.209517	0.8348
URB	0.009654	0.003860	2.501441	0.0152
C	3.228171	1.591889	2.027887	0.0472
R-squared	0.592237	Mean dependent var		3.878950
Adjusted R-squared	0.550055	S.D. dependent var		0.801295
S.E. of regression	0.537493	Akaike info criterion		1.697637
Sum squared resid	16.75610	Schwarz criterion		1.931802
Log likelihood	-48.17320	Hannan-Quinn criter.		1.790030
F-statistic	14.03991	Durbin-Watson stat		1.968594
Prob(F-statistic)	0.000000			

In 2021, the least-square analysis for developing countries reveals insights into factors influencing financial inclusion. Bank concentration exhibits a weak negative association, implying a marginal decline (0.0459 units) per unit increase, yet lacks statistical significance (p = 0.7954). Similarly, fiscal and monetary freedom show negligible negative impacts without statistical significance (p = 0.4610 and p = 0.5934, respectively). Contrarily, globalization demonstrates a weak positive relationship (0.0260 units increase per unit), significant at the 5 percent level (p = 0.0209). Notably, education emerges as a potent driver, indicating a substantial positive impact (1.0494 units increase per unit) with high statistical significance (p = 0.0162). Urbanization, while weakly negative, lacks statistical significance (p = 0.4041) in affecting financial inclusion.

Table 9: Least Square Outcomes of Developing Countries for the year 2021

Dependent Variable: FIN				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
BANKC	-0.045904	0.175960	-0.260877	0.7954
FP	-0.004068	0.005471	-0.743531	0.4610
MP	-0.004889	0.009090	-0.537820	0.5934
GI	0.026004	0.010859	2.394756	0.0209
EDU	1.049366	0.420024	2.498347	0.0162
URB	-0.003022	0.003587	-0.842289	0.4041
C	4.187141	1.015489	4.123276	0.0002
R-squared	0.528529	Mean dependent var		4.243105
Adjusted R-squared	0.465666	S.D. dependent var		0.496709
S.E. of regression	0.363085	Akaike info criterion		0.936293
Sum squared resid	5.932397	Schwarz criterion		1.198960
Log likelihood	-17.34361	Hannan-Quinn criter.		1.036993
F-statistic	8.407651	Durbin-Watson stat		1.674958
Prob(F-statistic)	0.000004			

Over 2014, 2017, and 2021, a consistent negative association between bank concentration and financial

inclusion prevailed in developing countries. Fiscal freedom exhibited varying impacts, with a weak negative link in 2017, though statistically insignificant in 2021. Higher monetary freedom positively influenced financial inclusion in 2014 and 2017 but weakened and became statistically insignificant in 2021. Globalization consistently displayed a strong positive correlation with financial inclusion across all three years. Education consistently demonstrated a robust positive relationship with financial inclusion, emphasizing its crucial role. Urbanization's impact was inconsistent, showing a weak positive association in 2014 and a significant positive link in 2017, but becoming statistically insignificant in 2021. These factors collectively shape financial inclusion in developing countries.

Ensuring model stability is crucial for consistent insights. Employing Cumulative Sum (CUSUM) and Cumulative Sum of the Squares (CUSUMsq) tests, we assessed the long-term and short-term stability. Graphical depictions in Figures 1–3 consistently show both CUSUM and CUSUMsq within critical thresholds, affirming the model's robustness and reliability.

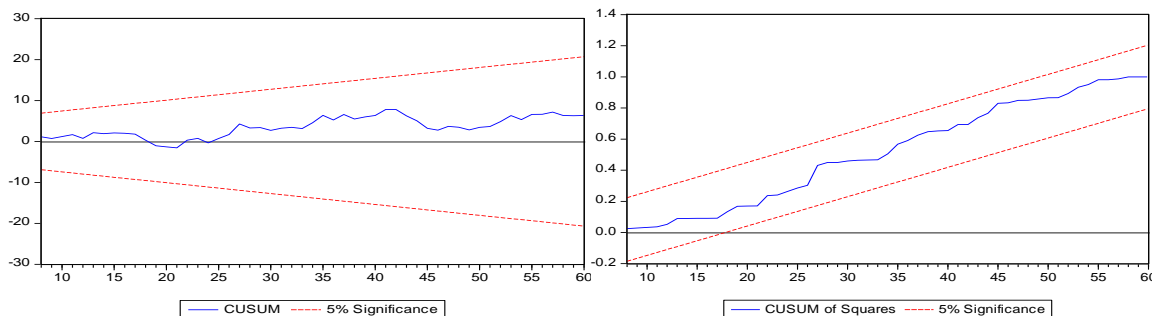**Figure-1: CUSUM of Developing Countries for the year 2014**

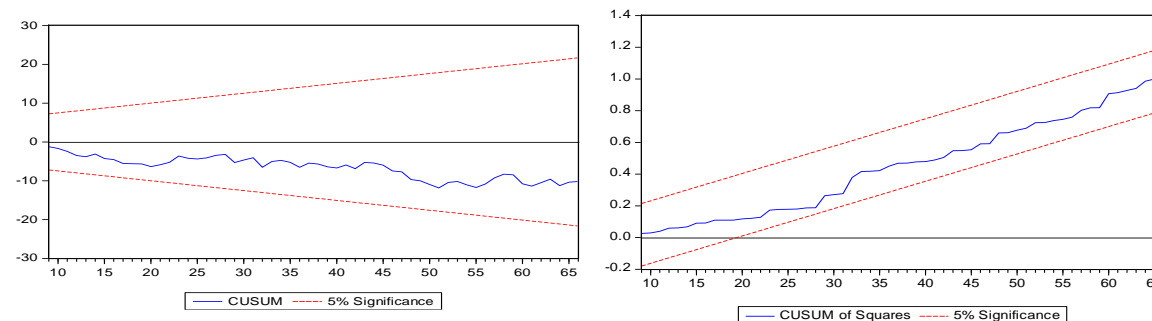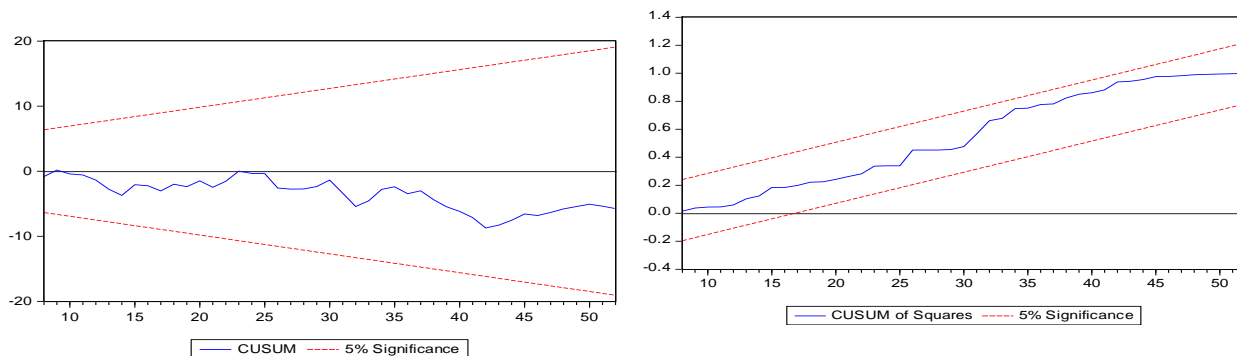**Figure-2: CUSUM of Developing Countries for the year 2017**

Figure-3: CUSUM of Developing Countries for the year 2021

Diagnostic tests confirm the statistical validity of our regression model for developing countries in 2014,

2017, and 2021. The Breusch-Godfrey Serial Correlation LM Test reveals no significant serial correlation in residuals, indicating no temporal dependence. Additionally, the Heteroskedasticity Test (Breusch-Pagan-Godfrey) finds no significant heteroskedasticity, ensuring consistent variance across independent variables. These results validate the model's reliability and robustness for each respective year.

Table 10: Diagnostic tests Outcomes of Developing Countries

For the Year 2014			
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.978973	Prob. F (2,21)	0.3922
Obs*R-squared	2.558521	Prob. Chi-Square (2)	0.2782
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.509987	Prob. F(6,23)	0.7945
Obs*R-squared	3.522561	Prob. Chi-Square (6)	0.7410
Scaled explained SS	0.722635	Prob. Chi-Square (6)	0.9940
For the Year 2017			
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.005758	Prob. F (2,56)	0.3723
Obs*R-squared	2.253838	Prob. Chi-Square (2)	0.3240
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.465800	Prob. F (6,58)	0.8308
Obs*R-squared	2.988115	Prob. Chi-Square (6)	0.8103
Scaled explained SS	1.839556	Prob. Chi-Square (6)	0.9338
For the Year 2021			
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.095922	Prob. F(2,43)	0.1353
Obs*R-squared	4.618931	Prob. Chi-Square (2)	0.0993
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.115784	Prob. F(6,45)	0.3684
Obs*R-squared	6.734241	Prob. Chi-Square (6)	0.3461
Scaled explained SS	4.400441	Prob. Chi-Square (6)	0.6227

5.1. Developed Countries Analysis

In 2014, developed countries demonstrated a high average financial inclusion score of 144.71, reflecting uniformity with limited variability (SD = 34.02) and a slight leftward skew. The Jarque-Bera test (p = 0.1948) suggests proximity to a normal distribution. Bank concentration, with an average score of 66.77, indicated a

moderately concentrated banking sector, displaying symmetry (p = 0.5143). Fiscal freedom (mean = 66.01) and monetary freedom (mean = 80.19) showed moderate and high levels, respectively, with symmetric distributions (p = 0.6071, p = 0.8231). Developed countries also had a high average globalization score (81.96) with consistent distribution (p = 0.3825). Overall, these findings denote relative uniformity in financial, banking, fiscal, monetary, and globalization metrics among developed nations in 2014.

Table 11: Descriptive Statistics of Developed Countries for the year 2014

	FIN	BANKC	FP	MP	GI	EDU	URB
Mean	144.7118	66.77441	66.00645	80.18710	81.95956	0.840581	74.42871
Median	157.6264	64.71483	65.90000	80.60000	81.25964	0.848000	76.64900
Maximum	185.8390	97.28323	86.90000	87.90000	89.40402	0.930000	97.69800
Minimum	62.48412	35.10137	37.60000	73.50000	73.19292	0.721000	52.88300
Std. Dev.	34.01875	17.74147	13.74411	3.479151	4.837867	0.054680	13.00533
Skewness	-0.767638	-0.079228	-0.225401	-0.167531	-0.048833	-0.217372	-0.131893
Kurtosis	2.580907	1.997720	2.245344	2.565128	1.784026	2.143205	1.878214
Jarque-Bera	3.271418	1.329994	0.998107	0.389283	1.922171	1.192338	1.715316
Probability	0.194814	0.514275	0.607105	0.823130	0.382477	0.550918	0.424154
Sum	4486.064	2070.007	2046.200	2485.800	2540.746	26.05800	2307.290
Sum Sq. Dev.	34718.25	9442.788	5667.019	363.1348	702.1486	0.089698	5074.160
Observations	31	31	31	31	31	31	31

In 2017, developed countries exhibited a high average financial inclusion score of 155.49, with moderate variability (SD = 30.36) and a slightly leftward skew, indicating concentration in higher financial inclusion. Bank concentration averaged 69.60, reflecting a moderately concentrated banking sector with symmetric distribution. Fiscal freedom scores averaged 66.79, displaying moderate fiscal freedom with a symmetric distribution. Monetary freedom averaged 79.27, indicating relatively high monetary freedom with limited variability. Globalization scored 83.54 on average, showcasing a high level with a symmetric distribution. Educational attainment, averaging 0.8572, reflected high consistency in 2017. Urbanization averaged 77.27, with some variability. Overall, the data suggested consistent levels across various indicators among developed nations.

In 2021, developed countries displayed a high average financial inclusion score of 160.60, with moderate variability (SD = 28.17). The negative skewness (-0.78) suggested a concentration of countries with higher financial inclusion. The Jarque-Bera test (p = 0.1746) indicated data close to normal distribution, revealing consistency in financial inclusion. For bank concentration, the average score was 67.22, indicating moderate concentration. The Jarque-Bera test (p = 0.7853) suggested a normal distribution, highlighting consistent concentration levels. Fiscal freedom averaged 65.98, with a symmetric distribution (p = 0.8092). Monetary freedom mean was 84.37, implying a high level, with a roughly symmetric distribution (p = 0.4791).

Globalization scored 84.11 on average, with a symmetric distribution (p = 0.5010). Education levels (mean = 0.8638) and urbanization rates (mean = 75.70) showed relatively consistent patterns. The Jarque-Bera tests supported normal distribution in both cases (p = 0.2411 and p = 0.4285, respectively), underlining consistent education and variability in urbanization across these nations.

Table 12: Descriptive Statistics of Developed Countries for the year 2017

	FIN	BANKC	FP	MP	GI	EDU	URB
Mean	155.4931	69.60243	66.79394	79.26970	83.54184	0.857242	77.26576
Median	164.8402	70.19060	65.80000	79.20000	83.65799	0.870000	79.36600
Maximum	198.4994	96.00947	92.90000	87.50000	90.44035	0.933000	100.0000
Minimum	86.65736	36.16505	39.30000	73.50000	75.05175	0.751000	53.90000
Std. Dev.	30.35881	17.90390	14.81500	3.043383	4.444057	0.052212	12.18125
Skewness	-0.743370	-0.218239	0.068342	0.804412	-0.107636	-0.348223	-0.154448
Kurtosis	2.479736	1.795039	2.103641	3.935323	1.930132	1.910175	2.217394
Jarque-Bera	3.411470	2.258361	1.130445	4.761827	1.637571	2.300038	0.973347
Probability	0.181639	0.323298	0.568234	0.092466	0.440967	0.316631	0.614668
Sum	5131.272	2296.880	2204.200	2615.900	2756.881	28.28900	2549.770
Sum Sq. Dev.	29493.03	10257.59	7023.499	296.3897	631.9885	0.087234	4748.248
Observations	33	33	33	33	33	33	33

Table 13: Descriptive Statistics of Developed Countries for the year 2021

	FIN	BANKC	FP	MP	GI	EDU	URB
Mean	160.5978	67.22439	65.97941	84.37353	84.10645	0.863824	75.70341
Median	167.1057	63.97927	65.20000	85.05000	83.48737	0.884500	77.99250
Maximum	202.4804	97.93184	91.00000	91.70000	90.66264	0.940000	97.96100
Minimum	86.73520	33.58298	37.20000	75.80000	76.92847	0.763000	53.75100
Std. Dev.	28.17061	15.94434	13.14423	3.362026	3.878451	0.053226	12.60079
Skewness	-0.779305	0.155729	-0.115598	-0.416766	0.057596	-0.387283	-0.242067
Kurtosis	2.813545	2.505918	2.504668	3.586631	2.018984	1.813158	2.019124
Jarque-Bera	3.490710	0.483259	0.423307	1.471794	1.382187	2.845443	1.695047
Probability	0.174583	0.785347	0.809245	0.479075	0.501028	0.241057	0.428475
Sum	5460.327	2285.629	2243.300	2868.700	2859.619	29.37000	2573.916
Sum Sq. Dev.	26188.25	8389.322	5701.436	373.0062	496.3985	0.093491	5239.735
Observations	34	34	34	34	34	34	34

In 2014, the correlation matrix, reveals moderate positive correlations between financial inclusion and bank concentration, and moderate positive correlations with education and urbanization. Strong negative correlations exist with fiscal and monetary freedom, indicating that higher freedom levels are associated with lower financial inclusion. Globalization demonstrates a moderate negative correlation, suggesting that increased globalization is linked to decreased financial inclusion.

Table 14: Correlation Matrix of Developed Countries for the year 2014

Variables	FIN	BANKC	FP	MP	GI	EDU	URB
FIN	1.000000						
BANKC	0.317575*	1.000000					
FP	-0.57883***	-0.284842*	1.000000				
MP	0.495117***	0.171867	-0.50462***	1.000000			
GI	0.562211***	0.338890**	-0.69791***	0.252155	1.000000		
EDU	0.583638***	0.247272	-0.255808	0.153758	0.340739*	1.000000	
URB	0.552780***	0.189104	-0.50665***	0.373372**	0.316135*	0.298153*	1.000000
***, **,* represent significant 1 percent, 5 percent, and 10 percent respectively.							

In 2017, the correlation matrix, reveals that financial inclusion moderately positively correlates with bank concentration. Fiscal freedom shows a strong negative correlation, indicating higher fiscal freedom associates with lower financial inclusion. Monetary freedom has a weak negative correlation, suggesting slightly lower financial inclusion with increased monetary freedom. Globalization exhibits a strong negative correlation, implying that as globalization rises, financial inclusion tends to decrease. Education level demonstrates a moderate positive correlation, indicating higher education levels align with greater financial inclusion. Urbanization displays a moderate positive correlation, signifying that urbanized countries tend to have higher financial inclusion.

Table 15: Correlation Matrix of Developed Countries for the year 2017

Variables	FIN	BANKC	FP	MP	GI	EDU	URB
FIN	1.000000						
BANKC	0.222890	1.000000					
FP	-0.56810***	-0.193232	1.000000				
MP	0.327185*	0.205567	-0.085629	1.000000			
GI	0.413121***	0.322562*	-0.61339***	-0.039192	1.000000		
EDU	0.586990***	0.286615*	-0.242098	0.142865	0.375741**	1.000000	
URB	0.597913***	0.272454*	-0.32737**	0.267196	0.216069	0.295613*	1.000000
***, **,* represent significant 1 percent, 5 percent, and 10 percent respectively.							

The 2021 correlation matrix (Table 4.16) reveals weak negative associations between financial inclusion and bank concentration, and a strong negative correlation with fiscal freedom. Monetary freedom shows a weak negative correlation, globalization has a strong negative link, education correlates positively, and urbanization moderately correlates with financial inclusion. Overall, these correlations suggest no significant multicollinearity concerns for regression analysis.

In 2014, the least-square results for developed countries indicate a significant negative relationship between bank concentration and financial inclusion (β = -0.3719, p = 0.0082). Fiscal freedom shows a weak relationship ($\beta \approx 0$), lacking statistical significance (p = 0.8736). Monetary freedom exhibits a significant positive impact on financial inclusion (β = 0.0325, p = 0.0079). Globalization is positively associated with financial inclusion (β = 0.0225, p = 0.0361). Education demonstrates a highly significant positive relationship (β = 1.7278, p = 0.0034), emphasizing increased financial inclusion with higher education. Urbanization has a positive but statistically insignificant effect on financial inclusion (β = 0.0044, p = 0.1027) in developed

countries during 2014.

Table 16: Correlation Matrix of Developed Countries for the year 2021

Variables	FIN	BANKC	FP	MP	GI	EDU	URB
FIN	1.000000						
BANKC	-0.024229	1.000000					
FP	-0.55082***	-0.20648	1.000000				
MP	-0.117672	-0.09898	0.123898	1.000000			
GI	0.374684**	0.221306	-0.505***	0.034569	1.000000		
EDU	0.637167***	0.243332	-0.254394	0.093973	0.411037**	1.000000	
URB	0.588565***	0.132680	-0.430***	0.003449	0.218984	0.361671**	1.000000
***, **,* represent significant 1 percent, 5 percent, and 10 percent respectively.							

Table 17: Least Square Outcomes of Developed Countries for the year 2014

Dependent Variable: FIN				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
BANKC	-0.371929	0.128461	-2.895264	0.0082
FP	-0.000593	0.003685	-0.160922	0.8736
MP	0.032461	0.011152	2.910866	0.0079
GI	0.022456	0.010086	2.226444	0.0361
EDU	1.727812	0.529946	3.260353	0.0034
URB	0.004408	0.002593	1.699592	0.1027
C	2.071997	1.540849	1.344711	0.1918
R-squared	0.699875	Mean dependent var		4.933663
Adjusted R-squared	0.621582	S.D. dependent var		0.276374
S.E. of regression	0.170013	Akaike info criterion		-0.504917
Sum squared resid	0.664804	Schwarz criterion		-0.177971
Log likelihood	14.57375	Hannan-Quinn criter.		-0.400324
F-statistic	8.939127	Durbin-Watson stat		1.701820
Prob(F-statistic)	0.000043			

In the least-square analysis for developed countries in 2017, the coefficient for bank concentration suggests a weak, non-substantial negative relationship with financial inclusion, supported by a non-significant p-value (0.3397). Fiscal freedom exhibits a moderately-sized negative relationship, where a unit increase leads to a 0.0063 decrease in financial inclusion; this is statistically significant at the 5 percent level (p = 0.0204). Monetary freedom has a moderately positive relationship, with a non-significant p-value (0.0863) at the 10 percent level. Globalization shows a weak, non-substantial positive link, with a non-significant p-value (0.7923). Education, with a highly significant p-value (0.0102), demonstrates a substantial positive association, where a unit increase leads to a 1.4429 increase in financial inclusion. Urbanization, although positively related, lacks statistical significance (p = 0.6886).

Table 18: Least Square Outcomes of Developed Countries for year 2017

Dependent Variable: FIN				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
BANKC	-0.118916	0.122174	-0.973337	0.3397
FP	-0.006285	0.002537	-2.477337	0.0204
MP	0.016849	0.009435	1.785789	0.0863
GI	0.002542	0.009553	0.266104	0.7923
EDU	1.442928	0.519546	2.777284	0.0102
URB	0.001040	0.002565	0.405470	0.6886
C	4.542483	1.308840	3.470617	0.0019
R-squared	0.590517	Mean dependent var		5.019812
Adjusted R-squared	0.492241	S.D. dependent var		0.219577
S.E. of regression	0.156465	Akaike info criterion		-0.681333
Sum squared resid	0.612030	Schwarz criterion		-0.360703
Log likelihood	17.90133	Hannan-Quinn criter.		-0.575053
F-statistic	6.008756	Durbin-Watson stat		2.070810
Prob(F-statistic)	0.000538			

In developed countries in 2021, the least-square analysis reveals significant findings. The negative coefficient for bank concentration, statistically significant at a 5% level, indicates that as bank concentration increases, financial inclusion decreases by approximately 0.2134 units. Similarly, fiscal freedom negatively influences financial inclusion, with a decrease of about 0.0054 units for each unit increase in fiscal freedom, statistically significant at a 1% level. Monetary freedom shows a non-significant negative relationship. Globalization exhibits a weak, non-significant positive link. The positive coefficient for education, highly significant at a 1% level, implies that a higher education level is associated with a substantial increase in financial inclusion. Urbanization, though positive, is statistically significant at the 10% level, indicating a relatively small impact on financial inclusion.

Table 19: Least Square Outcomes of Developed Countries for the year 2021

Dependent Variable: FIN				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
BANKC	-0.213370	0.087428	-2.440512	0.0215
FP	-0.005428	0.002002	-2.711341	0.0115
MP	-0.006809	0.006263	-1.087258	0.2865
GI	9.04E-05	0.006642	0.013604	0.9892
EDU	1.635240	0.386609	4.229702	0.0002
URB	0.003762	0.001907	1.972987	0.0588
C	6.836241	0.904413	7.558765	0.0000
R-squared	0.699399	Mean dependent var		5.061763
Adjusted R-squared	0.632598	S.D. dependent var		0.195109
S.E. of regression	0.118263	Akaike info criterion		-1.250576
Sum squared resid	0.377624	Schwarz criterion		-0.936325
Log likelihood	28.25978	Hannan-Quinn criter.		-1.143407
F-statistic	10.46999	Durbin-Watson stat		2.249527
Prob(F-statistic)	0.000005			

In 2014, higher bank concentration in developed countries exhibited a significant negative impact on financial inclusion, becoming statistically insignificant in 2017 and re-emerging as significant in 2021. Fiscal freedom showed varied influence, with a negative and significant relationship in 2017, while monetary freedom's positive impact on financial inclusion weakened in 2021. Globalization consistently facilitated financial inclusion, although its strength varied. Higher education consistently displayed a robust positive association with financial inclusion. Urbanization exhibited inconsistent effects, with a statistically significant positive relationship in 2017. Overall, these findings highlight the dynamic nature of factors influencing financial inclusion in developed countries over the years.

Ensuring model stability is crucial, offering insights into its consistency over time. Hansen notes biases from model misspecification in time series estimates. Using Cumulative Sum (CUSUM) and Cumulative Sum of the Squares (CUSUMsq) tests, following Brown et al.'s method, our model exhibits stability across the specified period, validating its robustness.

Figure-4 CUSUM of Developed Countries for the year 2014
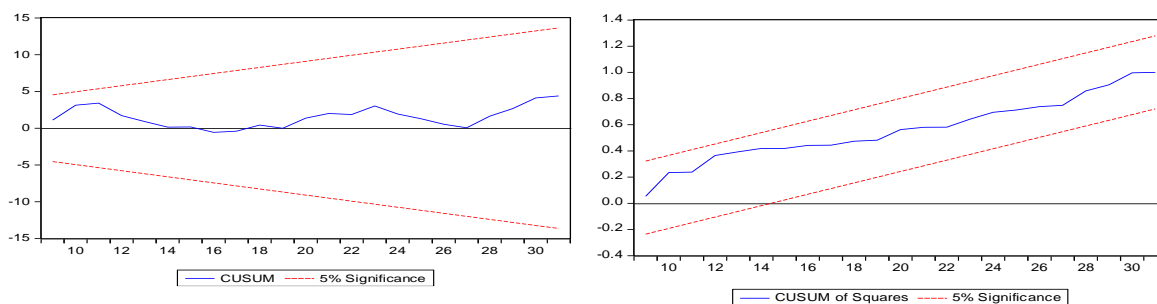
Figure-5 CUSUM of Developed Countries for the year 2017
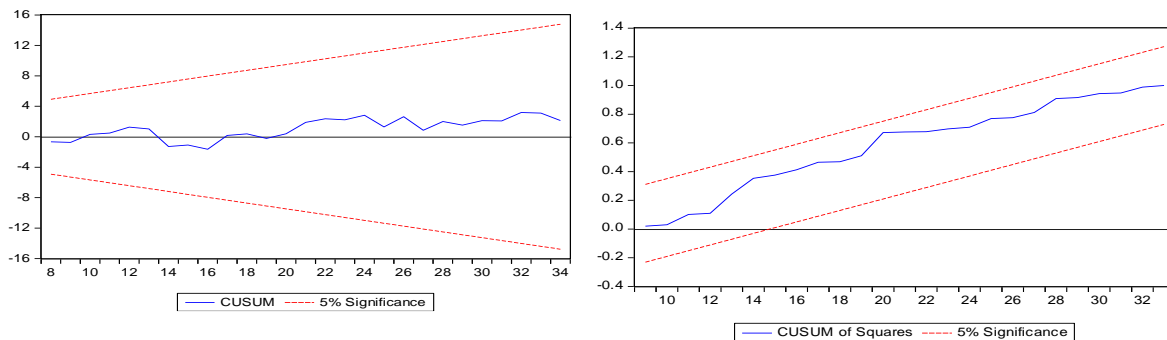
Figure-6 CUSUM of Developed Countries for the year 2021
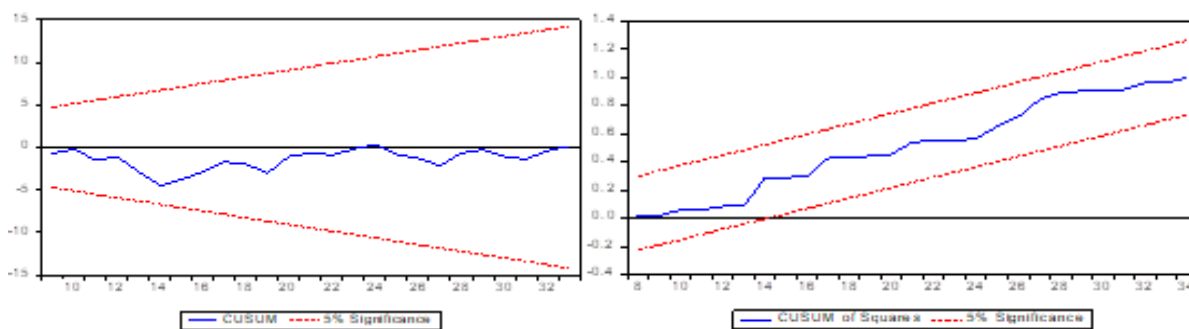
Diagnostic tests in 2014, 2017, and 2021 confirm the statistical validity of regression models for developed

countries. The Breusch-Godfrey Serial Correlation LM Test reveals no significant temporal dependence in residuals, ensuring model appropriateness. Additionally, the Heteroskedasticity Test (Breusch-Pagan-Godfrey) finds no significant evidence of varying residuals, supporting model reliability across different independent variable levels for each respective year.

Table 20: Diagnostic tests Outcomes of Developed Countries

For the Year 2014			
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.712961	Prob. F (2,21)	0.5017
Obs*R-squared	1.907509	Prob. Chi-Square (2)	0.3853
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.681654	Prob. F (6,23)	0.6661
Obs*R-squared	4.529277	Prob. Chi-Square (6)	0.6054
Scaled explained SS	1.137584	Prob. Chi-Square (6)	0.9799
For the Year 2017			
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.752965	Prob. F (2,23)	0.1956
Obs*R-squared	4.232628	Prob. Chi-Square (2)	0.1205
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.480386	Prob. F (6,25)	0.2253
Obs*R-squared	8.388861	Prob. Chi-Square (6)	0.2110
Scaled explained SS	3.539726	Prob. Chi-Square (6)	0.7387
For the Year 2021			
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.562921	Prob. F (2,25)	0.5766
Obs*R-squared	1.465163	Prob. Chi-Square (2)	0.4807
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.670012	Prob. F (6,27)	0.1668
Obs*R-squared	9.202640	Prob. Chi-Square (6)	0.1625
Scaled explained SS	4.301126	Prob. Chi-Square (6)	0.6360

In 2014, the negative relationship between bank concentration and financial inclusion was pronounced in both developing and developed countries, aligning with previous research highlighting the restrictive impact of concentrated banking sectors (Claessens & Laeven, 2004; Kanas et al., 2019; Sulehri et al., 2024). This trend persisted in 2017 for developing nations, indicating ongoing challenges despite financial access improvement efforts. However, the relationship varied in developed countries, underscoring the complexity influenced by market dynamics and regulatory reforms (Demirgüç-Kunt and Levine, 2018; Sulehri and Ali, 2024; Sulehri et al., 2024). Fiscal freedom's impact on financial inclusion showed inconsistency. In 2014, it had no significant effect, possibly overshadowed by other determinants. In 2017, a weak negative relationship emerged for developing countries, suggesting fiscal policies' nuanced impact on inclusivity. In 2021, the relationship persisted but lacked statistical significance, emphasizing its contextual nature and susceptibility

to various influences.

Monetary freedom positively influenced financial inclusion in 2014 and 2017, aligning with the notion that a favorable monetary policy environment fosters sector development and inclusion (Beck et al., 2007; Ali & Ahmad, 2014; Cull et al., 2018). However, the weakened relationship in 2021 prompts exploration of changing global conditions and financial regulations.

Globalization consistently promoted financial inclusion, strengthening over time. In 2014, it positively impacted both developing and developed countries, fostering opportunities through financial innovation and cross-border services (Ali & Rehman, 2015; Dabla-Norris et al., 2015; Ali & Audi, 2018; Claessens et al., 2008). The trend continued in 2017, emphasizing globalization's role in expanding access, especially with the rise of digital financial services. In 2021, the relationship was significant for developing countries, reflecting increased reliance on cross-border digital payments.

Education emerged as a crucial factor, robustly correlating with financial inclusion in both developing and developed countries throughout 2014, 2017, and 2021. Financial literacy programs in schools and adult education initiatives played a pivotal role in bridging gaps for underserved populations and enhancing inclusivity. Urbanization's impact varied. In 2014, weak positive associations in developing countries suggested urban areas' potential contribution to financial inclusion. In 2017, higher urbanization significantly correlated with increased inclusion in both developing and developed nations. However, the non-significant relationship in 2021 indicated that urbanization alone might not sustain or enhance inclusion over time, emphasizing the evolving landscape influenced by regulatory policies and technological advancements.

In summary, bank concentration consistently hindered financial inclusion, while fiscal freedom, monetary freedom, globalization, education, and urbanization demonstrated nuanced impacts, with variations across developing and developed countries over the years. These findings underline the intricate interplay of economic factors in shaping financial inclusion dynamics.

6. **Conclusions**

In conclusion, this study provides valuable insights into the dynamics of financial inclusion in both developing and developed countries, highlighting the complex relationships between various economic factors. The consistently negative link between bank concentration and financial inclusion emphasizes the need for diversified financial institutions, such as microfinance institutions and community banks, to counter the adverse effects of concentrated banking sectors. Encouraging the establishment of these institutions in underserved areas can mitigate the challenges posed by high bank concentration. The inconsistent impact of fiscal freedom on financial inclusion suggests the importance of reviewing and adjusting taxation policies to strike a balance between revenue generation and promoting inclusivity. Offering tax breaks or incentives to financial institutions serving marginalized communities can contribute to this balance. The positive influence of monetary freedom on financial inclusion, evident between 2014 and 2017, underscores the significance of maintaining monetary policies that ensure stability and foster an environment conducive to inclusive financial

practices. Targeted measures to increase access to credit for low-income individuals and small businesses can further enhance financial inclusion. Globalization emerges as a consistent facilitator of financial inclusion, emphasizing the need for collaboration with neighboring countries and international organizations to simplify cross-border transactions and remittances. Streamlining regulations and reducing transaction costs will encourage international financial integration, contributing to broader financial access. The pivotal role of education in enhancing financial inclusion is evident, advocating for comprehensive financial literacy programs across all education levels. Focus on improving financial knowledge and skills, particularly in underserved regions, can bridge the gap for those with limited access to financial services. The varying impact of urbanization underscores the need for context-specific policies, considering regulatory frameworks, financial literacy programs, and technological advancements in promoting financial inclusion. Policy suggestions derived from these findings include encouraging the development of diverse financial institutions, adjusting taxation policies, maintaining favorable monetary policies, fostering international collaboration, implementing comprehensive financial literacy programs, and tailoring outreach efforts to rural areas. Continuous monitoring and evaluation of these policies are crucial for informed adjustments and improvements, ensuring effective progress toward enhanced financial inclusion in diverse national contexts.

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