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The Impact Of Financial Inclusion And Institutional Quality On Bank Efficiency Moderated By Economic Freedom: Evidence From Low-Income Countries

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Abstract

This study examines how financial inclusion and institutional quality influence bank efficiency in low-income countries, with a specific focus on the moderating role of financial freedom. Using panel data and IV-2SLS estimation techniques to address endogeneity, the analysis explores two measures of bank efficiency: Bank Overhead Costs to Total assets (BOC) and Bank cost to Income Ratio (BIC). The findings reveal that financial inclusion (FI), political stability (POL), and control of corruption (COR) significantly affect banking costs, while rule of law (RL) is exogenous in this context. FI and POL are associated with increased banking costs, potentially due to the financial and administrative burden of expanding access and ensuring political stability. In contrast, stronger control of corruption reduces banking costs by improving governance and reducing inefficiencies. The study also finds that financial freedom (FF) significantly moderates these relationships: it weakens the cost-increasing effects of FI and POL and reduces the cost-saving impact of COR. This suggests that while FF can improve efficiency in weaker institutional settings, it may offset benefits in contexts with stronger governance mechanisms. The study recommends that policymakers in low-income countries pursue an integrated strategy that promotes financial freedom alongside institutional strengthening to achieve optimal bank efficiency and broader financial sector development.

JEL Classification: G21, O16, O43, and C33

Keywords: Financial Inclusion, Institutional Quality, Economic Freedom, Bank Efficiency, Financial Freedom.

Introduction

The availability of financial services at the global level has increased significantly in the recent years. This phenomenon has mainly been explored in the context of financial inclusion and financial exclusion. Financial inclusion is a concept described by Kozak (2021) and refers to the degree to which the financial system embraces economically vulnerable and low-income citizens, or how they can, respectively, access financial services. Financial services provided by banks include: savings accounts, credit and debit services, earnings on deposits, facilitation of convenient payments and money transfer, insurance and facilitation of government payments such as subsidies, direct transfer of money. Nonetheless, a considerable segment of the population also, called the unbanked, do not enjoy access to the mainstream banking system. Formal financial inclusion programs are one way to improve the financial wellbeing of these unbanked people. Such initiatives offer minimal services and include issuing no-frills or zero-balance accounts to vulnerable people, economical payment services, cheap insurance, and loan products targeted to individuals with lower socioeconomic status (Agarwala et al., 2023).

According to empirical evidence, the impact of bank regulation and management on financial stability could be subject to various factors including bank corporate governance and the macroeconomic environment. Based on the said recognition, it is imperative to find out how different bank laws impact the soundness of the financial system. We will build on this idea and see if the quality of institutions lead to better bank supervision and regulation for financial stability. Institutional quality may enhance the ability of regulatory authorities to implement policies effectively, which may strengthen the relationship between bank regulations and strength. Institutional quality reflects the effective functioning of a country's set of rules and laws, governance and enforcement of those rules. Examining the link between the efficiency level of banks and that of good institutions leads us through a complicated mechanism pulling important implications. The quality of institutions may affect bank rules and oversight in various ways. Due to strong institutions, the lenders' market can function efficiency. When institutions are good, like having a stable government, preventing corruption, and following the law it could lessen problems where borrowers hide information and take risky actions. As a result, improved loan terms may be possible along with reliable loan repayments. According to study, the quality of the institutions may affect the impact of bank regulation and supervision on the stability of the banks (Sunn et al., 2022).

The general quality of a country's institutions, which refers to the effectiveness, integrity and functionality of its legal systems, regulatory structures and governance mechanisms, has emerged as a potent determinant of many economic outcomes. Most of the economic literature has concentrated on factors like human capital, technology and physical resources to explain the difference in economic growth and development of nations. However, institutional economics attempt to demonstrate the link between institutional quality and bank efficiency (Khan, Abdulahi, Liaqat, & Shah, 2019). Recent arguments postulate that some developing economies always seem to outperform others over the long-run even when they are endowed with adequate resources and globalisation of consistent policy measures. Developing countries that have been able to improve their institutional quality at the same time have performed better in the long term than those where institutional quality is weaker or declining. Research reveals that numerous developing nations, which miss their economic growth targets or experience limitations of certain growth thresholds, often endure problems of inadequate transparency and political instability. In contrast, countries that have a high level of transparency and political stability as a result of strong institutions have shown good performance and have effectively transitioned through different stages of economic transformation (Khan et al., 2019).

Not being open or being corrupt can distort the political agenda by means of corrupting influence on decision making. Public officials may accept bribes and favours to participate in corruption, leading to overemphasis on certain areas. One example of tax evasion and its impact on economic growth is the diversion of aid and polices. This will generally lead to a massive investment in the wrong projects. An example will be the government spending on the defense sector instead of education and health (Wenlong et al., 2022). The World Bank President has pointed out that corruption is a big reason why developing and emerging economies struggle to grow. Secret payment methods breed corruption and lead to a hidden economy. This may be a bigger problem in the emerging economies but it is also a problem in developed economies to a certain extent.. For instance, a 2015 survey conducted among finance professionals in the United States and the United Kingdom revealed that engaging in unlawful financial activities was seen as necessary at least once to achieve success or gain a competitive advantage in the market.

The problems of financial inclusion in higher middle or upper-income nations are not the same as those in low-income nations, though they are substantial. Some subgroups of the population, regardless of the increase in income levels, can still be economically unfortunate, indicating the stability of income inequality. Although the technological infrastructure tends to be more advanced, there might be a digital divide and also certain areas without access to digital financial services. The use of digital payments should be encouraged, and the heavy reliance on cash should be addressed. Strong consumer protection strategies and financial literacy should be encouraged even among those with higher income. Replacing small informal financial services with formal services as well as regulating the newly emerging financial technologies necessitate a fragile balance. Moreover, the financial inclusion of immigrants, refugees, and geriatric subgroups of the population is also characterized by specific difficulties. It is important to protect privacy and security of data and use data to drive better financial services (Ojeka et al., 2019).

There is a need to ensure that the cooperation between policymakers, financial institutions and stakeholders work towards helping them overcome these challenges, and to eliminate comprehensive financial exclusion in lower middle or upper-income countries. Bank financing can be accessed by 58 percent of developing country businesses and 20 percent of low-income nations (Figure 1), although access to global financing is restricted to developing country enterprises (Figure 1). Expenses, distance, and bureaucracy still make access to funding difficult to firms and more so to the small and medium sized firms. Small funding, extensive collateral, and interest rates may work against business growth. Due to the inadequate infrastructure of banking organizations, a big percentage of people, especially in rural areas do not access formal financial services. Financial illiteracy and lack of knowledge about financial goods often lead to the inability to make proper use of them. The lack of proper technological infrastructure and also the prevalence of informal financial practices all contribute to the problem of exclusion.

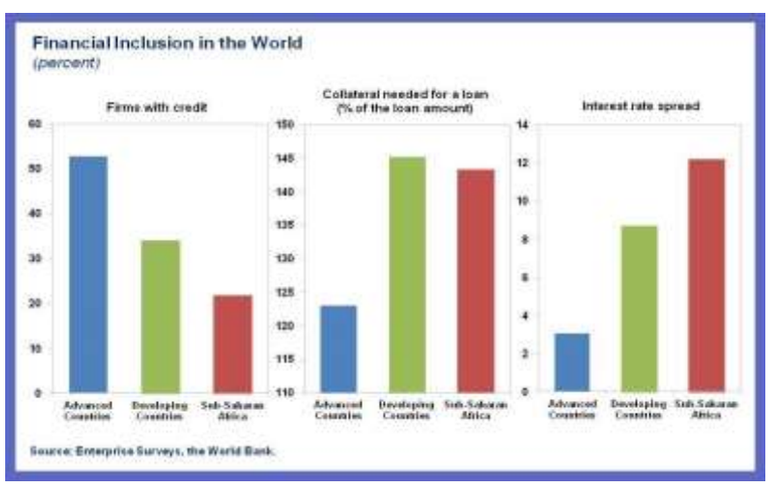


Figure 1 Financial inclusion in the world

Both inequalities in income and gender influence access to financial services. These challenges are worsened by the fact that there are restrictive laws, absence of credit information, and security issues. Besides cultural norms and social variables, economic issues influence financial inclusion. The only solution to tackle these challenges is to have multiple parties collaborate to grow financial literacy, invest in digital infrastructure, implement enabling policies, and come up with equal access to financial solutions. Several barriers can be broken through so that individuals could be granted more authority and economic growth could be accelerated in Pakistan (Ramzan et al., 2021).

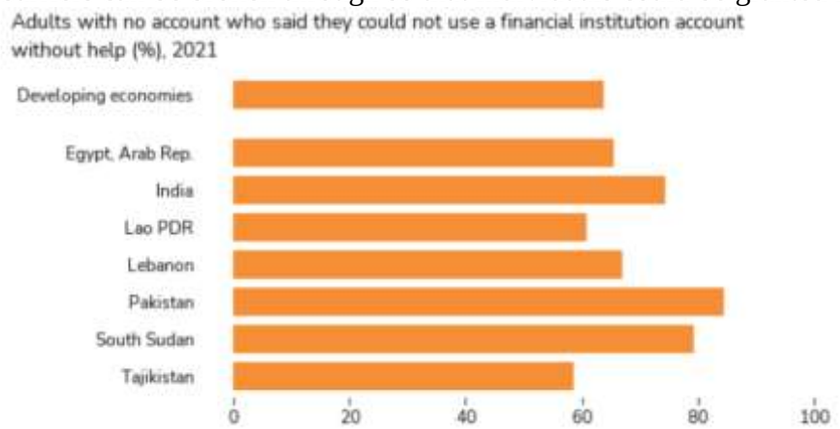


Figure 2 Financial inclusion in Pakistan (Source: Global Findex Database)

The percentage given in graph 2 indicates that 82% of the adult population in Pakistan lack financial account and have reported that they cannot use financial institutions. The implication of this is that a considerable amount of the adult population is deprived of access and use of formal financial services. This can be attributable to a few rationales, and may depend on a variety of phenomena including restricted physical banking organization, lower rates of financial literacy, deficiency in trust with financial institutions, and issues connected with lacking account requirements. These are the barriers that should be addressed in order to enhance the state of financial inclusion in Pakistan. Efforts to conduct more financial literacy programs, to spread the availability of banking services in distant regions, to make accounts more open, easier to open and to improve consumer protection can make a difference towards a more inclusive financial regime. When citizens and firms have access to critical financial products and services, gain, use and manage resources, and participate more fully in economic activity, the growth and stability of the economy of a nation will benefit (Khan et al., 2019).

People get access to money as economy grows. As people become richer, their demand for financial services to save their earnings or invest in their services rises. Second, the rise of aggregate income level in the economy expands the scale of the market broadening the base. These new investors raise credit standards. To meet this requirement, a new bank must set up shop. Competition among competing banks helps in financial inclusion. Though financial inclusion and institutional development interventions are receiving increasing attention, the role of financial freedom, which denotes the extent to which agents (both individuals and businesses) can make economic choices free from government interference, in bank performance remains less explored. Financial freedom can influence the way bank efficiency is improved by financial inclusion and institutional quality. Here, bank efficiency refers to the ability of banks to optimally utilize resources to provide financial services, while minimizing costs and risks. Although several studies have investigated the independent effect of financial inclusion and institutional quality on banking outcome, little research has analyzed the joint effect. Joint insights are more relevant in poor countries, where structural constraints are larger. In addition, the moderating effects of economic freedom have also been ignored enough most of the time, particularly in cases where the financial and regulatory frameworks are still developing. This research would help bridge this gap by examining how institutional quality and financial inclusion influence the efficiency of the banks in the low-income countries, as well as how the relationship between the two variables is affected by the degree of financial freedom. This study is useful in building a complex perception of how the policy and governance systems can promote or fail to promote the performance of the financial market by maintaining its concentration on such economies, which have relatively weak institutions and low financial outreach.

Literature Review

Theory of Institutional Perspective

In the discussion on financial inclusion adding a institutional theory can opens useful conceptual analytical tools that give an data on how effective institutions drive financial inclusion. This method helps grasp what is really happening with a given situation. Additionally, it helps find effective solutions that will help the process of dealing with the problem of financial exclusion prevalent among developing and emerging economies. The structural theory, which is based on the establishment of the authority structure, rules and routines, studies formal and legal aspects of the government structures (Asante et al 2023). This school of thought emphasizes how institutions, including human-made ones, can exert influence over economic activities, including personal and business practices, in specific institutional environments. The theory claims that the institutional environment is an important element in defining economic behaviour, and therefore, an important determinant of market participation and policy making.

Financial inclusion and bank efficiency

Several research studies have explored this topic of banking industry efficiency in promoting Financial Inclusion (FI), addressing FI indicators and the measuring techniques used. Shihadeah and Liup (2019) provide universal results that demonstrate how a better FI can result in greater returns to banks at the cost of risk. According to Ernst and Young (2017), approximately 21 percent of the world population do not have access to banking products, and the introduction of affordable banking services can include them in the formal banking system, hence their financial stability. The other progress observed since the year 2011 in the increase in the percentage of bank account or mobile account owned by adults which now stands at 76%, as compared to 51%, at the time, is a remarkable change that bears positive consequences in the facilitation of financial inclusion practice (Bukhari et al., 2024). The report released by the World Bank highlights the importance of accessing the financial system as individuals are able to earn interest, stock and secure their money. Compared with the environment of developing economies, a large portion of adults have long been not included in the active institutionalized system of money relations. Financial inclusion has seen a significant increase in recent years, with account ownership in developing economies increasing to 71% by 2021, representing an increase of 63% between 2017 to 2021 (Figure 2). Financial inclusivity has been driven, in a way, by the popularization of mobile money services like M-Pesa, which have been instrumental in spurring the development of financial inclusivity. Research conducted by Georgetown University and MIT has shown how effectively mobile money services,

namely M-Pesa in Kenya, can have a transformative effect on poverty alleviation. According to estimates, M-Pesa's impact on reducing poverty in Kenya has resulted in decreasing the number of people living in poverty by 2%. This result highlights the promise of comparable monetary services to promote positive socioeconomic results. In developing economies, we have witnessed a significant growth in account ownership and an explosion of the use of mobile money services. These developments have significant relevance to financial inclusion in that they increase access to financial services to traditionally marginalized populations. In addition, these developments can help it in poverty reduction. The ability to serve a growing number of people with formal financial services can lead to economic growth, enhancement of financial stability, and the general enhancement of financial well-being of the individuals and communities as well as national.

According to Chauvet and Jacolin (2017), Financial Inclusion has a convincing impact on business growth, and a high-competition percentage of banks have a tendency of supporting a high level of Financial Inclusion. A study by Nguyyen & Lee (2021) involving a sample of 1507 banks covering the period between 2008 and 2017, revealed that FI has a significant contribution to better performance among banks in the Asian region. In a similar manner, Shihadeh et al. (2018), in their research that explored the period between 2009 and 2014 and included a sample of 13 Jordanian banks, found a positive effect of FI on bank performance. As such, banks should be encouraged to invest more in advancing Financial Inclusion.

Lei et al. (2019) carried out a study based on the data covering 31 countries in Asia between 2004 and 2006. They undertook a study aimed at exploring the connection between the concept of Financial Inclusion and how it influences financial efficiency. Their results suggested that the relationship between financial inclusion and financial stability are mutually reinforcing and a balance can be established between these two goals. In another study by Lopez and Winkler (2019), they looked at figures of 189 countries between 2004 and 2017. Their study found out that those countries where level of financial inclusion is high, are least exposed to major shifts in borrowing and lending practices (Bukhari, 2024).

In the case of ATMs, Ramzan et al. (2021) have proposed that the higher the amount of investment by a bank in Corporate Social Responsibility (CSR), the more likely a bank is to be listed among the emerging banks. To reach and serve a larger customer base and consequently enhance profitability, banks need to establish extensive branch and ATM networks, as highlighted by Shihadeh (2021). Byukusenge (2021) has emphasized the significance of introducing ATMs as a highly effective mean, akin to digital banking, debit cards, and smart cards, enabling clients to access their accounts for withdrawals and deposits. However, some researchers, such as Kumar et al. (2021), have indicated that ATMs may not necessarily impact bank profitability, suggesting that increased income from additional loan accounts may be offset by transaction and direct expenses.

Institutional quality and bank efficiency

The financial sector significantly contributes to the betterment of economic growth. Academicians have identified certain factors that determines stability of the financial system, thus having an impact on economic growth. Most of the research has been done in two segments of the financial sector, that is, the stock market and the banking sector. Many studies have been done in determining the stock market performance. However, there is little or no study done on finding the factors affecting the banking industry as you will see in Banking industry performance essay. The increasing number of studies promotes that strong institutional quality characterized by well-designed rules, effectiveness of the governance mechanism and the rule of law brings efficiency to banks. This provides a foundation which strengthens the confidence of investors and reduce information asymmetry while improving risk policy of banks (Wenlong et al., 2023).

Countries which have efficient banking sector were found to have high institutional quality. An effective legal system lowers transaction costs and makes financial agreements more credible because of its ability to enforce contracts quickly and fairly. It also collaborates with good institutions that can supervise and regulate the banks encouraging proper lending and risk management. If a regime has stronger political stability then the lending conditions will be better. Moreover, this will decrease the moral hazard of the borrower and lessen loan defaults. Research indicates that the cost of bank loans rises due to political uncertainty as evidenced most notably in the syndicated loan market. Equally, policy risk raises costs of debt to companies. In addition, the quality of political institutions can positively influence disclosure and transparency by firms, ie the information of banks on borrowers (Bukhari, 2025). This might lessen bad choice and lead to a more selective and better loan price. The banking system is more efficient if political stability prevails in the country and this is corroborated by econometric evaluation in the countries. A study conducted by Francis, Hasan, and Zhu (2014) demonstrates that uncertainty in politics increases the cost of bank credit within the syndicated loan market. Likewise, Bradley, Pantzalis, and Yuan (2016) discover that policy risk increases the cost of debt in firms. These findings highlights the effects of political stability on funding costs and, by extension, efficiency of the bank.

Furthermore, the research indicates that political stability does not only have an impact on the direct funding costs of the bank. Better governance, reduced corruption and stronger enforcement of regulations go hand-in-hand with strong political institutions. Time and again, scholars have revealed that all these combined factors lead to improved bank efficiency where risk is managed much better due to greater appraisal of credit score and better overall functional performance. Studies on certain countries or areas provide a closer look. Researchers have studied how political stability influence how banks lend money, how they decide who to give money to and what risks they will take when giving out money. Stable Political Scenario. Most repeated studies underscore political stability helps banks immensely support those borrowing money for the long-term as they have lesser chances of defaulting on payment.

Corruption

Controlling corruption is also linked to efficient lending and higher probability of loan repayment. Reducing corruption in lending activities which most of the time entails losses of the loans, lending and repayment can be promoted into a more favorable climate. Moreover, using empirical evidence, there is a correlation between greater extent of corruption and increased loan spreads in some countries. This is attributable to the adverse outcomes of corruption on the financial performance of the borrowing institutions, and therefore, increasing the likelihood of loan losses. Moreover, corruption can weaken institutions responsible for enforcing loan contracts, intensifying borrower moral hazard.

It is always discovered that the cases of corruption have been accompanied by lower operational efficiency of the banking system and by greater financial instability. Similarly Corruption, as pointed out by Beck, Demirguc-Kunt and Levine (2006), limits the performance of the banks in terms of making efficient allocation of resources, with subsequent misallocation of credit and reduction of productivity in general. Corruption defined as the abuse of governmental or company power or authority to personal benefit is a notorious problem that has very strong influence on economies particularly in the developing and emerging status group (Chen et al., 2015). Its harmful consequences include economic status, finance, and societal welfare implications, which are evident both publicly and privately. This problem especially affects the vulnerable elements of the society and adds to the overall societal socio-economic picture. International repositories like the European Union (2013) reiterate these effects of corruption on other indicators of economic growth like foreign direct investment (FDI), production costs, and natural resource endowment, thus hindering economic growth. These observations are consistent with previous ones by Mauro (1995) and Mion and Weill (2010). Discussing the complicated dependence of corruption and bank sector performance, the preceding works of Levine (1997, 2005), and Rousseau and Yilmazkuday (2009) have revealed greater emphasis on the direct correlation associated with economic growth and asset distribution. The implications of

corruption regarding effective asset allocation in a banking setting has created a lot of concern and has created concerns regarding its implication on the actions of a bank. This point can be further supported by recent findings of Qi and Ongena (2019), which suggest that corruption negatively impacts the performance of banks due to the interference with the credit channel. When corruption is high, banks will become exposed to political pressure leading to lending money to parties that are considered not credit worthy (Fungacaka et al., 2015). The cycle further leads to corruption among bank employees, high ratios of bad loans and eventual default of banks over long periods.

The importance of the rule of law and an independent judiciary cannot be over emphasized when it comes to establishing a properly functioning lending market. Loans are costlier and also difficult to repay in countries with poor judicial systems. Besides, inefficient judicial procedures lead to a gradual lowering of collateral recovery rates in case of loan repayment default. This worsens the moral hazard of the borrower. Inefficient and slow court proceedings can also incentivize opportunistic borrowers to default, as lenders may not have the economic means to recover the loan. Empirical literature focuses on the contribution of the rule of law in banking efficiency. This reveals the role of law to lend an insight into the banking systems operational's reality.

Studies have shown that a strong rule of law can significantly enhance the efficiency of banks and other entities. A robust legal system makes contracts transparent, predictable and enforceable, necessary for the smooth functioning of banks. A study by La Porta et al. (1998) and Beck et al. (2006) reiterates that the functioning of legal systems of nations helps in improving the information asymmetry, lending to better credit distribution and enhancing the investors' confidence. All this helps in running banking operations better.

The rule of law impacts more than just the banking sector and its efficiency. An efficient legal system helps the parties to settle disputes and enforce contracts quickly. It also helps reduce uncertainties and delays. It views better creditors will promote true lending practices which will go to better loan books of banks. Further, the rajchers state the application of the rule of law prevents corruption and strengthens governance processes in banks. When a country has a strong legal system, it discourages corruption and can help in creating accountability. Further, a great legal system will increase the risk management of banks that will improve the efficiency of its operations..

Financial Freedom

Being financially independent measures the efficiency of the banking industry and its independence from the government's control and intervention in the financial system. When the banks and insurers and suppliers of capital markets are owned by the state, it reduces competition, which results in lower quality (Kumar et al., 2022).

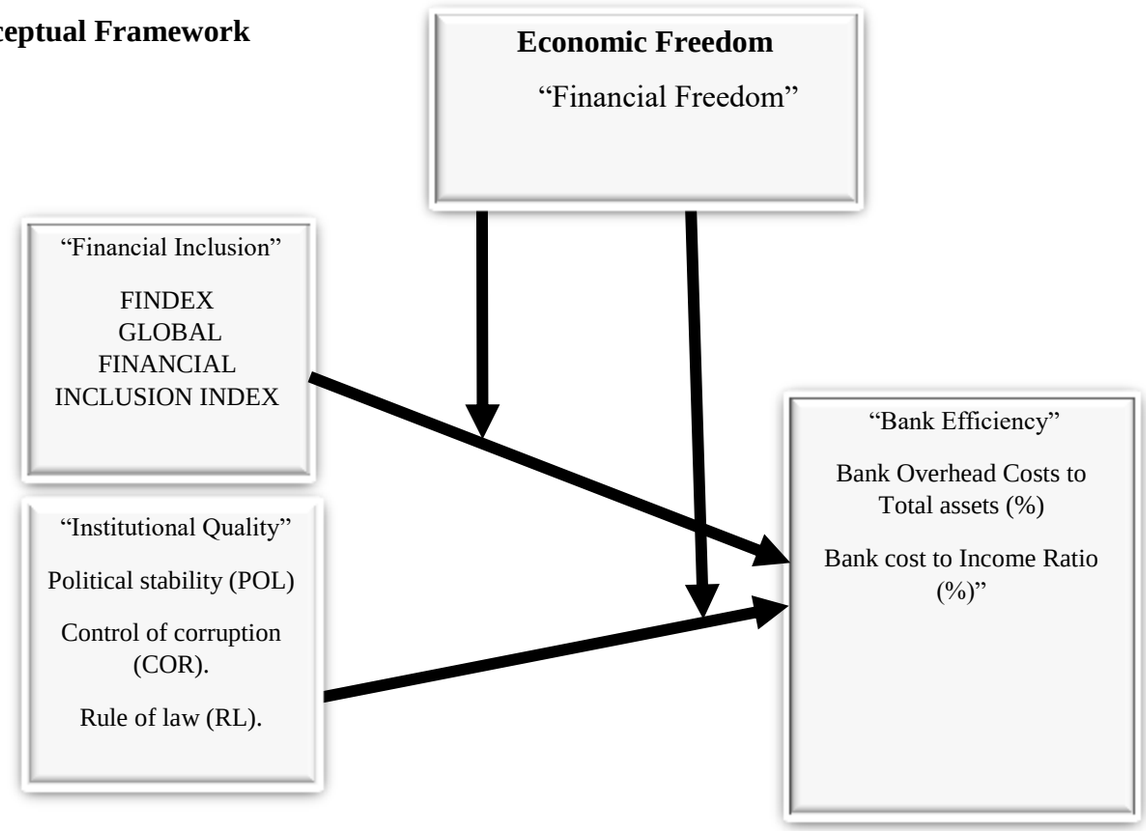
In an ideal banking and financial system, the oversight and regulation of an independent central bank primarily aim at the upholding of contractual engagements as well as the prevention of fraud. This way, the intervention of the government is restricted. The process of credit allocation is based on market principles.

In this arrangement, the government doesn't control any financial institutions. Hence, both individuals and businesses can enjoy a variety of financial services offered by many financial entities. Banks are free to lend and take deposits and transact in foreign currencies. A research study was done to see whether financial inclusion causes economic growth and reduces poverty. During their analysis from 122 banks in Japan, they utilized data from 2004 to 2018 (Kumar et al., 2022). They find that financial inclusion is essential even in the developed world.

They notably discovered that Japan's bank profitability is negatively impacted by the decline in the number of bank branches. The number of loan accounts and ATMs do not have a significant impact on bank profitability. Among bank-specific variables, "cost management, credit risk management, and bank size" emerged as the primary drivers of profitability. Hussain et al. (2021) conducted a research study using "cross-sectional and panel data analysis", to study the relationships between "economic freedom, financial literacy, government quality, and financial inclusion by using the data of 98 countries from 2007 to 2018".Their key findings suggest that the correlation of ICT diffusion-economic freedom-financial development has a long-term positive impact on financial inclusion, highlighting the significance of developing a working environment which is conducive to sustained economic growth. On the basis of these studies we hypothesized that,

H1: Financial Inclusion has a significant impact on Bank Efficiency
H2: Institutional quality has a noteworthy effect on Bank Efficiency.
H3: Financial freedom moderates the relationship between Financial Inclusion and bank efficiency.
H4: Financial freedom moderates the relationship between institutional quality and bank efficiency.

Conceptual Framework



Data and Methodology

The study employs banks from low-income countries and the data from 2005 to 2020. Data has been collected from DataStream and World Bank indicators. Target population for low income economies ($1135 or less) is 26 in numbers. All countries with available data have been included in the analysis (21). The study uses low-income economies to get empirical results. Low-income economies are characterized by limited access to financial services, underdeveloped banking infrastructure, and weaker institutional frameworks, making them especially vulnerable to financial inefficiencies. Despite these challenges, they remain largely understudied in the literature on bank performance and governance. Most existing research focuses on high-income or emerging markets, where institutions and financial systems are relatively mature. In contrast, low-income economies present a unique context where improvements in financial inclusion, institutional quality, and economic freedom could yield disproportionately high developmental gains. Understanding these relationships in such settings is crucial for informing targeted policy interventions and for achieving broader development goals, such as financial equity, poverty reduction, and inclusive economic growth. IV2SLS regression is used to check the causality between the independent and dependent variables.

Variables Used	Proxies	Notation
Bank Efficiency	· Bank Overhead Costs to Total assets (%) (**BOC)**	**BOC**
	· Bank cost to Income Ratio (%)" **(BCI)**	**BCI**
Financial Inclusion	· Global Financial Index	**FII**
Institutional Quality	Political stability (POL)	**POL**
	Control of corruption (COR).	**COR**
	Rule of law (RL).	**RL**
Control Variables		
	Gross Domestic Product per capita (current US$)	**gdp**
	Bank Stability (STAB) Is Measured by Bank Z Score Which Captures The Probability Of Default In The Banking System.	**stab**
	Gross Domestic Product (GDP) Per Capita Growth Is Used To Proxy Economic Growth (ECG)	**ecg**
	Inflation (INF) Is Measured by Consumer Prices (Annual Percentages)	**INF**
Financial Freedom	FINANCIAL FREEDOM INDEX	**ff**

Table 1: Variables Measurements

Econometric model

The study's primary objective is to develop a model that will be employed to analyze the influence of FI and IQ on Bank efficiency.

$$BE_{it} = \propto +\beta_1 FII_{it} + \beta_2 IQ_{it} + \beta_3 CON_{it} + \beta_4 FF_{it} + \beta_5(FI_{it} \times FF_{it}) + \beta_6(IQ_{it} \times FF_{it}) + \varepsilon_{it}$$ ---------- *Eq*-i

$$BOC = \propto +\beta_1 FII_{it} + \beta_2 IQ_{it} + \beta_3 CON_{it} + \beta_4 FF_{it} + \beta_5(FI_{it} \times FF_{it}) + \beta_6(IQ_{it} \times FF_{it}) + \varepsilon_{it}$$ ---------- *Eq*-ii

$$BCI = \propto +\beta_1 FII_{it} + \beta_2 IQ_{it} + \beta_3 CON_{it} + \beta_4 FF_{it} + \beta_5(FI_{it} \times FF_{it}) + \beta_6(IQ_{it} \times FF_{it}) + \varepsilon_{it}$$ ---------- *Eq*-iii

BEit as the bank efficiency variable (BOC, BCI) for bank *i* at time *t*. *FIit* as the vector of financial inclusion Index for bank *i* at time *t*. *IQit* as the vector of institutional quality variables (POL, COR, RL) for bank *i* at time *t*. *CONit* as the vector of control variables (stab, ecg, gdp, INF) for bank *i* at time *t*. *FFit* as the financial freedom index for bank *i* at time *t*. α represents the intercept. 3β1,β2,β3 are the coefficients for the respective variable groups. β4 is the coefficient for the financial freedom index. β5 and β6 are the coefficients for the interaction terms between financial inclusion and financial freedom, and institutional quality and financial freedom, respectively. *uit* is the error term.

Empirical Results

	mean	Std	min	max
FI	-0.7	0.379	-1.161	1.441
POL	31.19	19.462	0.474	94.686
COR	-0.663	0.538	-1.673	1.537
RL	-0.696	0.451	-1.87	0.662
BOC	3.993	2.077	0.046	12.533

BCI	55.956	13.547	26.65	202.041
FF	55.115	5.848	21.4	71.5
STAB	17.535	8.562	0.221	44.514
ECG	4.401	4.118	-20.805	21.542
INF	7.763	23.667	-16.86	557.202
GDP	2.647	4.02	-20.894	19.508

Table 2 Descriptive Statistics

Table 2 uses descriptive statistics to show that financial inclusion, institutional quality and macroeconomic performance differ greatly between low income countries. The average financial inclusion index is negative (-0.7) so most countries in the sample have a low level of financial penetration. According to various indicators of institutional quality, the control of corruption (mean = -0.663) and rule of law (mean = -0.696) are under pressure. Moreover, the data shows the inefficiency of the banking sector. It shows that the average bank overhead cost is 3.99 per cent. Furthermore, the allocation of credit (BCI) shows high variability. The moderating variable in this study, financial freedom, has a modertely average level but has a wide range, thereby supporting the hyptothesis of having an impact on finance and institution to bank efficiency. Moreover, the data show substantial macroeconomic volatility, especially with respect to inflation and GDP growth, that tells us how the present economic system is fragile.

	P-value	Status
FI	0.0029	Endogenous
POL	0	Endogenous
COR	0	Endogenous
RL	0.7035	exogenous

Table 3 Durbin Wu Hausman Edogneneity Test

A Durbin-Wu-Hausman (DWH) test was employed for checking endogeneity of key explanatory variables. The outcomes suggest that financial inclusion (p=0.0029), political stability (p<0.0001) and control of corruption (p<0.0001) are endogenous, suggesting these variables might be correlated with an error term. There may be reverse causation, omitted variable bias, measurement error, and etc. If we use standard regression, then there will be biased estimates and inconsistent estimates. In contrast, the rule of law (p = 0.7035) was determined to be exogenous, indicating that it does not have a statistically significant correlation with the error term in the regression model and can be included without adjustment. Since several variables are endogenous, instrumental variable (IV) estimation methods such as 2-stage least squares (2SLS) or generalized method of moments (GMM) are considered suitable to get consistent estimates.

IV-2SLS Estimation Summary with Dep Variable BOC						
R-squared	0.253		Adj. R-squared		0.2396	
F-statistic	239.11		P-value(F-stat)		0	
	Parameter	**Std. Err.**	**T-stat**	**P-value**	**Lower CI**	**Upper CI**
const	-5.704	2.6621	-2.1427	0.0321	-10.922	-0.4865
RL	-1.086	0.2791	-3.8907	0.0001	-1.6331	-0.5389
FF	0.1543	0.0476	3.2424	0.0012	0.061	0.2475
stab	-0.0254	0.0078	-3.2466	0.0012	-0.0407	-0.0101
ecg	0.5732	0.0881	5.5026	0	0.4004	0.7459
inf	0.0046	0.006	0.7706	0.4409	-0.0071	0.0163
gdp	-0.61	0.0885	-6.8912	0	-0.7835	-0.4365
FI	12.126	1.9758	6.1371	0	8.2534	15.999
POL	0.2743	0.0535	5.1228	0	0.1694	0.3793
COR	-8.5753	1.6042	-5.3454	0	-11.72	-5.4311
FI_FF	-0.2195	0.0368	-5.964	0	-0.2917	-0.1474
POL_FF	-0.0049	0.001	-5.1124	0	-0.0068	-0.003
COR_FF	0.1642	0.0269	6.0956	0	0.1114	0.2179

Table 4 IV-2SLS Regression Table DV is BOC

The dependent variable BOC works out to 25.3% indicating that nearly 25% variation in the model can be linearly explained by the independent variable with statistically significance of the results indicated with the result of F-statistic value of 239.11 ($p < 0.01$). A negative and statistically significant coefficient for rule of law indicates that strict adherence to laws reduces the overhead costs of banks. The findings indicate that financial freedom has a positive and significant impact on bank performance. That is to say, more financial freedom and less banking restriction to make a bank perform efficiently. More stable political environments lead to more bank efficiency because those political environments have less overhead costs. Economic growth has a positive and significant relationship with the overhead cost, possibly because there are more banking transactions in the economy. Inflation looks to be statistically insignificant in this setting. However, GDP growth has a negative impact on overhead costs. Therefore, macroeconomic

enhancement can bolster efficiency. Out of institutional quality indicators, financial inclusion has a positive and significant effect on bank efficiency. On the other hand, control of corruption has a negative and statistically significant effect, meaning lower corruption means lower overhead costs. Political stability also shows a positive effect.

The interaction terms of financial freedom and the main explanatory variables exhibit moderating effects. The relationship between financial inclusion and financial freedom is negatively significant, indicating that financial freedom dampens the positive impact of financial inclusion on bank's cost of overheads. Political stability has the opposite effect on financial freedom as well. In comparison, the dynamic between corruption control and financial freedom is favourable and meaningful. Hence, the efficiency gains from corruption control are larger where financial environments are freer. This shows how things done by institutions and economic freedom affect bank efficiency in lower-income countries.

IV-2SLS Estimation Summary with Dep Variable BIC

R-squared	0.1453		Adj. R-squared		0.1453	
F-statistic	197.95		P-value(F-stat)		0.13	
	Parameter	**Std. Err.**	**T-stat**	**P-value**	**Lower CI**	**Upper CI**
const	-2.0352	15.433	-0.1319	0.8951	-32.283	28.212
RL	-9.7369	1.8874	-5.1589	0	-13.436	-6.0377
FF	1.0576	0.2811	3.7626	0.0002	0.5067	1.6084
stab	-0.2853	0.047	-6.0695	0	-0.3775	-0.1932
ecg	1.623	0.5727	2.8342	0.0046	0.5006	2.7454
inf	0.0304	0.0126	-2.4063	0.0161	-0.0552	-0.0056
gdp	-1.7452	0.5331	-3.2737	0.0011	-2.7901	-0.7003
FI	55.932	11.135	5.023	0	34.107	77.757
POL	1.2424	0.318	3.9064	0.0001	0.619	1.8657
COR	-43.91	8.5622	-5.1283	0	-60.691	-27.128
FI_FF	-1.0872	0.2064	-5.2668	0	-1.4918	-0.6826
POL_FF	-0.0236	0.0057	-4.1435	0	-0.0348	-0.0124
COR_FF	0.9637	0.1454	6.6288	0	0.6787	1.2486

Table 5 IV-2SLS Regression Table DV is BIC

The IV-2SLS model estimating the impact on bank interest cost yields an R-squared of 0.1453, indicating that approximately 14.5% of the variation in interest cost is explained by the model. The F-statistic value of 197.95 with a p-value of 0.13 suggests that the model as a whole is not statistically significant at conventional levels. Despite this, individual coefficients offer valuable insights. The coefficient for rule of law is negative and statistically significant, suggesting that stronger legal institutions reduce bank interest costs. Financial freedom has a positive and significant effect, indicating that higher levels of financial liberalization are associated with increased interest costs, potentially reflecting higher competition or market activity. Political stability negatively affects interest cost, implying that more stable political environments contribute to lower borrowing costs.

Economic growth positively influences bank interest costs, while inflation also appears to have a positive but less robust effect. GDP growth shows a negative and significant relationship with interest cost, implying that macroeconomic expansion may ease funding pressures for banks. Financial inclusion is positively associated with interest cost, possibly due to broader access to credit markets. Political stability and control of corruption also significantly impact interest cost, with the former positively and the latter negatively influencing it, suggesting that corruption reduction lowers banking sector costs.

The interaction terms also give more insight into the moderating effects of financial freedom. This interaction between financial inclusion and financial freedom is a negative significant effect, indicating that the cost-increasing effect of financial inclusion is reduced in more liberalized financial systems. Likewise, the effect of political stability in lessening interest cost is curbed when united with the higher degree of financial freedom. Conversely, control of corruption has a positive effect on financial freedom indicating that the cost-reducing effect of less corruption is not significant in high financial freedom. These results demonstrate the cross-relationships among institutional health, economic indicators, and financial liberalization in determining bank interest rates in low income economies.

Discussion

The findings of the study show that cost structures of banks in the low income economies are shaped by institutional quality, financial inclusion, macroeconomic conditions and financial freedom. It further adds that the strong influence of institutional variable i.e. strong rule of law and lower corruption tends to reduce the banking costs. This is aligned with the theoretical base of the study which asserts that better governance lowers risk, improves contract enforcement and reduces monitoring costs. On the contrary, both the overhead and the interest costs increase due to the implementation of financial inclusion. It is due to the resource intensive nature of expanding outreach in low-income countries, where there are evident gaps in infrastructure, informal markets and administrative inefficiencies.

Further, the findings regarding the moderating role of financial freedom in the underlying study also make an important contribution to the literature. The negative interaction effects between the financial freedom and both financial inclusion and political stability in the bank overhead cost model indicate that the financial environments that are liberal can absorb cost pressures which are generated in an attempt to extend the financial access or in order to maintain the political order. In that connection, it is pertinent to note that the dampening effect of financial freedom suggest that liberalized systems reduce the cost impact of expanding financial inclusion or improving political stability. On the other hand, positive interaction between control of corruption and financial freedom shows that diminishing marginal returns of governance improvement in highly liberalized economies. It shows that if there is excessive liberalization, without sufficient regulatory oversight, it may weaken the cost saving benefits which are expected to be achieved through institutional strengthening.

Theoretical and Practical Contributions

The study contributes in number of ways. It highlights that institutional quality alone is not responsible for improving banking efficiency, rather the degree of financial freedom also plays its role. This aspect advances the institutional economics and financial intermediation theories. Further, the introduction of financial freedom as a moderating variable in the study adds to the literature on the banking efficiency in low income countries. It is a significant contribution of the study. It further adds that the institutional reforms have non-linear effects. The study analyzes two frameworks of bank costs that is BOC and BIC, which enriches the literature as well.

The study also highlights certain implications for the policy makers such as synchronizing institutional strengthening with financial liberalization. It should also be noted that financial inclusion increases bank costs therefore; investments in technological infrastructure should be made to reduce the cost burden of the banks. Moreover, improving the rule of law and reducing corruption will lower the bank overhead and interest costs.

Limitations and Future Directions

The study faces data limitation and time constraints. Other indicators may be added such as bank profitability, stability which is firm level variables to get additional insights about how institutional factors shape overall banking performance. The future research may consider other methodological approaches such as GMM to capture dynamic adjustments. The model of the study may be expanded beyond cost metrics. The comparison between private and public banks may be explored. Further, additional institutional dimensions such as transparency, regulatory capacity may be added to deepen the understanding of the impact of institutional environment on the banking outcomes.

Conclusion

The study finds that institutional quality, macroeconomic factors, and financial freedom are important and subtle determinants of the costs of the banking sector in low-income countries based on the IV-2SLS estimation results of both Bank Outreach Cost (BOC) and Bank Interest Cost (BIC). Key indicators like Rule of law, political stability, control of corruption and financial inclusion have high individual impacts of reducing the cost of banks or augmenting the cost of banks. Furthermore, the interaction terms emphasize that the effect of the institutional factors is not even but is moderated by the degree of the financial freedom. As an example, although financial inclusion and political stability tend as such to raise costs, their interplay with financial freedom limits its strength thus implying that liberalized financial environments can absorb or equalize some institutional risks. On the other hand, the positive relationship between control of corruption and financial freedom implies the diminishing returns of institutional enhancements in excessively liberalized environments. These findings are in line with the earlier studies, where the results show that stronger institutional quality and lower corruption tend to reduce the intermediation frictions and improve the performance of the financial sector (Beck et al, 2006; Khan et al, 2019; Ojeka et al, 2019). Further the combined role of financial inclusion and financial freedom also complement, studies such as (le et al, 2019, agarwal et al, 2023) show that financial inclusion and financial freedom interact with the governance to shape banking performance and financial development. On the whole, the results underline the necessity to maintain a balance between institutional reforms and the speed at which the financial system is liberalized so that effective cost management can be provided in the banking sector.

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