Does Bank Competition Infect Financial Inclusion and Bank Performance? Empirical Evidence & Analysis

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ABSTRACT

The intricate nexus among bank competition, financial inclusion and bank performance is supposed to be the central theme to comprehend the paradigm shift of financial system. Hence, with meta-analysis, critical review and empirical evidence, this study addresses the ongoing pivotal issue that healthy competition within the banking industry has a significant impact on financial inclusion as well as economic development. Overall, the test results document a significantly positive nexus between bank competition & financial inclusion, whilst also remarks additive bank performance. It indicates that greater competition can increase the probability of having financial inclusions, and thereby better banking performances. The implication is that greater competition among banks is a positive force for engaging more people into the financial system, enhancing profits, and thereby ensuring better financial inclusion in the economy. However, the investors might require an additional risk premium in a highly competitive environment. Therefore, this academic novelty addresses a core research issue of finance & banking regime; offers an innovative & in-depth insight on underlying nexus between bank competition and financial inclusion; and also provides further direction to rethink on fostering bank competition and financial inclusion for additive value creation through wealth maximization.

Keywords: Bank competition; Financial inclusion; Bank performance; Digital Transections, Economic Development.

INTRODUCTION

Financial inclusion, often described to be the process which ensures that individuals and businesses have access to essential services of the financial world, has emerged as a critical component of economic development and poverty reduction strategies worldwide. The provision of these services, which encompass savings, credit, insurance, and payment mechanisms, enables target group to participate more actively in the formal & smart economy, reduce vulnerabilities, and thereby improve overall well-being. As such, the pursuit of financial inclusion has become a central focus for governments, financial institutions, and international organizations seeking to bridge socioeconomic disparities and promote economic growth. However, achieving comprehensive financial inclusion is a multifaceted challenge that requires a well-balanced understanding of various interconnected factors. One of these factors is the role of bank competition, which plays a pivotal role in shaping the accessibility, affordability, and quality of financial services. The degree of competition within the banking sector has far-reaching implications for the effectiveness of financial inclusion efforts. Considering the demand of the time, this study seeks to explore the intricate underlying relationships between bank competition, financial inclusion, and above all bank performance, drawing insights from a diverse array of empirical studies and theoretical frameworks.

In recent years, scholars and researchers have increasingly fostered their attention to the impact of bank competition on financial inclusion. The rationale behind this focus is rooted in the belief that a competitive banking sector can drive innovation, reduce costs, and expand access to financial services. In this aspect, Agarwal et al. (2022) investigated how heightened competition among banks influence their pricing strategies, revealing the complexities involved in adjusting rates for adjustable-rate mortgages (ARMs). This study highlights the competitive pressures that can lead banks to obscure critical pricing terms, potentially

affecting consumer decision-making. Furthermore, Avom et al. (2022) delved into the relationship between financial inclusion and banking concentration, showcasing that this connection is contingent on various contextual factors, including mobile phone penetration and regulatory quality. These findings underscore the importance of understanding the nuanced dynamics at play when considering the impact of bank competition on financial inclusion. We analyze that balancing competition with financial inclusion goals necessitates a comprehensive understanding of the specific conditions that drive positive outcomes in the smart economy.

In connection to earlier issue, we find that another dimension of the intricate web of relationships lies in the performance of banks themselves. The extent to which banks are financially sound, efficient, and responsive to customer needs can significantly influence the accessibility and affordability of financial services. Hence, research by Bose et al. (2016) emphasizes the potential of financial inclusion disclosures in annual reports, revealing how factors such as banking firm size and institutional investors can foster greater transparency and inclusivity in banking operations. Similarly, Ditta and Saputra (2020) demonstrate that various financial inclusion indicators can enhance banking performance, leading to improved profitability ratios. These insights highlight the symbiotic relationship between bank performance and financial inclusion. However, it is crucial to recognize that achieving financial inclusion is not solely contingent on fostering competition or enhancing bank performance. The interplay between these factors as well as the broader regulatory and policy landscape are also equally pivotal. The reason is that policymakers face the delicate task of striking a balance between promoting competition and ensuring that consumers are protected from predatory practices. In addition, regulatory frameworks aim to create an environment where competition fosters innovation and efficiency.

The objective of this study is to synthesize and critically assess the existing body of literature on bank competition, financial inclusion and above all bank performance. It aims to provide a comprehensive understanding of their inter-dependencies. Hence, it delves into empirical studies, theoretical models, and policy implications to shed light on how these elements interact and influence one another within various contexts. By doing so, it contributes to the ongoing discourse surrounding financial inclusion, offering valuable insights that can inform evidence-based policy decisions aimed at promoting inclusive and sustainable economic growth. In a nutshell, Hence, with meta-analysis, critical review and empirical evidence, this study addresses the ongoing pivotal issue that healthy competition within the banking industry has a significant impact on financial inclusion as well as economic development.

This research piece is appropriate in the context of corporate governance decision particularly related to banking industry around the globe. At first, based on an in-depth and extensive search in the extant literature, we identified that no earlier study attempted to conduct a meta-analyses on the dialogue between link bank competition and financial inclusion in the economy. Hence, our meta-analysis (Appendix-1) for developing literature review on the impact of bank competition on financial inclusion is notably scarce that offers innovative methodological insights into examining the underlying nexus between bank competition and financial inclusion. It is noteworthy to mention that hardly quite a few empirical studies attempted to investigate the impact of bank competition on financial inclusion indicating an unexplored and novel research area within academia. This fundamental study aims to fill-up the gap by contributing original research that sheds a new light on deeper understanding underlying relationship between bank competition and financial inclusion. The findings of the empirical results contribute that investors might require a relatively higher risk premium if there is relatively high bank competition and thereby additive value to the banking industries in the market.

LITERATURE REVIEW AND HYPOTHESIS

To address the research issue, based on the latest and indexed scholarly works published in good quality journals of ISI Web of Science (ISI_WOS), we develop an intensive literature review followed by a structured meta-analysis (Appendix-1). We find that the relationship between bank competition and financial inclusion has been a subject of growing interest among researchers. Competition among banks is often seen as a driver of financial inclusion, as it can lead to increased access to financial services, lower costs, and

improved service quality. An increasingly competitive banking sector often leads to greater innovation, lower costs, and improved accessibility to financial services, all of which can contribute positively to financial inclusion efforts. In this respect, Agarwal et al. (2022) opined that when banks face more competition due to deregulation, they may hide important details in adjustable-rate mortgage (ARM) terms, potentially confusing consumers even though initial rates appear lower. Avom et al. (2022) explored how factors like mobile phone usage and regulatory quality influence the link between banking concentration and financial inclusion. Further, Adhamovna (2016) claimed that the significance of potential factors influencing bank competition varies across diverse markets due to differences in market concentration, number of banks, and macroeconomic conditions.

We analyze that bank performance is a critical factor influencing financial inclusion in the economy. A well-performing bank is better equipped to expand its services, enhance product quality, and reduce costs. Hence, bank performance plays a critical role in shaping the accessibility and quality of financial services. In this aspect, Bose et al. (2016) examined that financial inclusion disclosures in bank annual reports are influenced by factors like bank size, institutional investors, and religion-based operations have a positive impact on bank performance. Likewise, Ditta and Saputra (2020) found that different financial inclusion indicators can boost banking performance, resulting in better profitability ratios like Return on Assets (ROA) and Net Interest Margin (NIM). This highlights a positive and mutually beneficial connection between banking performance and financial inclusion. Bose, Bhattacharyya, and Islam (2016) found that financial inclusion levels are positively influenced by factors such as bank size, growth opportunities, institutional investors, audit committee size, and the presence of religiosity, among others. However, Shah and Ali (2022) emphasize the continued exclusion of many individuals from the formal financial system despite its significance for economic development.

In coherence to the impact of financial inclusion on bank performance, Chinoda and Kapingura (2023) emphasize that digital financial inclusion positively influences bank stability by reducing non-performing loans. Conversely, they caution that heightened bank competition might have a negative impact on bank stability in the long run. Jungo et al. (2022) highlighted the significance of balanced financial regulation in moderating the relationship between financial inclusion and bank stability in the economy. Jiang, Yu, and Zhang (2022) found that digital disruption may prompt branch-reliant banks to charge higher prices to non-tech-savvy customers, potentially limiting their branch options and markups. In addition, Shah and Ali (2022) underline the importance of financial inclusion in reducing income inequality and fostering economic growth, emphasizing its close relationship with competition and performance. Further, Shihadeh et al. (2018) discovered that financial inclusion improves bank efficiency and profitability, suggesting that inclusive practices incentivize banks to invest more capital in their enhancement.

In addition, there are several scholarly works that explored the link between bank competition and systemic risk may have a positive impact on financial inclusion efforts without causing instability. Hence, Moyo and Sibindi (2022) opined that bank competition, measured by the Lerner index and concentration ratios, reduces the probability of informal firms accessing finance. In Sub-Saharan Africa, financial inclusion has a complex relationship with bank profitability, with post-global financial crisis periods showing a negative influence (Yakubu & Musah, 2022). These studies collectively emphasize the importance of aligning financial inclusion efforts with strategies to enhance banking sector profitability, recognizing the varying effects of competition and inclusion across regions and contexts. Policymakers should consider these nuanced relationships to promote both financial stability and economic development.

Considering the current paradigm shift in digitalized financial systems, we notice that the intricate relationships between bank competition, financial inclusion and thereby bank performance are central to understanding the dynamics of the financial sector and thereby notable impact on economic development. Competition and performance have a positive impact on financial inclusion, but their effectiveness is contingent upon diverse contextual factors and regulatory frameworks. Effective policies should consider local conditions and regulations to leverage these benefits while safeguarding consumers and financial stability. Regulatory authorities must monitor the market to detect hidden fees or practices that may disadvantage consumers, as highlighted by Agarwal et al. (2022). Boosting financial literacy empowers consumers in competitive markets, while policymakers must balance competition with preventing predatory

practices and instability. Ultimately, more research is required in various global settings to inform evidence-based policy-making and advance global financial inclusion efforts.

Based on the above discussion, we find that the underlying healthy competition within the banking industry has a significant impact on financial inclusion. It is observed that enhanced banking competition plays a pivotal role in expanding access to credit for small and emerging enterprises, thereby contributing to overall economic growth. Additionally, internal competition among banks has been found to result in the provision of financial services to investors and savers at lower costs. Subsequently, a conceptual analysis is conducted to elucidate the ways in which financial inclusion influences competition in the banking sector. This analysis aims to provide a comprehensive understanding of the relationship between these two variables. Finally, based on the conceptual insights gathered, reflecting the potential outcomes and effects of bank competition on financial inclusion, this study proposes two hypothesis: (a) Generally, greater competition can increase the probability of having banking inclusions; & (b) Generally, greater competition can increase the probability of having banking performance.

METHOD AND DATA

In this study, we mainly investigate if bank competition affects financial inclusion and thereby bank performance in the digitalized financial systems. Following the sequence, in this section, we consider the underlying research method & estimation, data & sampling criteria and descriptive analysis before moving ahead to final results and analysis. We attempted to identity the best fitted econometric models which are optimal for empirical study by considering the underlying model specification, data property and time horizon. In a nutshell, to address the research issue, we conduct time series multiple regression analysis based on monthly test bed between Jan.2015 to Dec.2024 for an emerging economy of Bangladesh. Hence, two distinct types of data are required. Firstly, individual-level financial inclusion data for the sample period is essential. Secondly, bank competition indicators specific to Bangladesh are also necessary. Data pertaining to the banking industry are compiled from various reputable databases, including the Global Financial Database, World Bank, and the Bangladesh trading economy data-set. The dependent variables considered in the analysis encompass Return on Assets, Return on Equity, Bank Account, Bank Branches, Number of ATMs, Bank Competition Indicators, Capital Adequacy, Earnings, and Profitability, among others. So, this comprehensive approach enables a thorough exploration of the impact of bank competition on financial inclusion within the context of Bangladesh.

Sample & Data

Quantitative data for both the dependent and independent variables are collected from various secondary sources, including bank websites, the Global Financial Development Database, and the trade economy data-set specific to the emerging economy of Bangladesh. This research relies exclusively on quantitative data to conduct the analysis and draw conclusions. A multiple regression analysis is conducted based on 10 years monthly data-set between Jan.2015 to Dec.2024, having data-set of minimum 3 years. The utilization of quantitative data allows for a rigorous and empirical examination of the relationships between the variables of interest, contributing to a comprehensive evaluation of the impact of bank competition on financial inclusion in the economy.

Global Financial Inclusion (Findex) database

In the research conducted, the World Bank's Global Financial Inclusion (Global Findex) database is considered as a valuable resource. This database, overseen by Demirguc-Kunt and Klapper (2020), presents a comprehensive view of financial inclusion indicators across over 140 economies, drawing from a sample of more than 150,000 adults aged 15 and above. Notably, the 2017 edition of the database includes updated metrics pertaining to access to formal and informal financial services, alongside novel data on the utilization of financial technology (fintech) – specifically, the use of mobile phones and the internet for financial transactions. The focal point of this study lies within the banking sector of Bangladesh, with the research sample confined to this specific geographic area. As depicted, key findings from the analysis reveal that 50 percent of adults in the database possess bank accounts, with 6 percent holding debit cards and 12 percent in

possession of credit cards. For those individuals who do not maintain bank accounts, 9 percent attribute this to geographical distance from banking facilities, while 10 percent cite cost-related problems. Additionally, 9 percent of respondents reported borrowing money from financial institutions. Although the Global Findex database encompasses variables related to digital banking, mobile banking, and other emerging financial technologies, the research deliberately omits these elements. This omission stems from two primary rationales. Firstly, these FinTech services are still evolving and are predominantly used for basic financial transactions, with limited functionalities as savings or credit instruments. Secondly, evaluating competition within the FinTech sector presents challenges due to the scarcity of available data. However, this study rigorously explores the landscape of traditional banking products within the context of emerging economy-Bangladesh.

Financial Soundness Indicators (FSI) database

The research incorporates data from the International Monetary Fund's Financial Soundness Indicators (FSI) database at the country level, which is then merged with the Global Findex database. This combined dataset allows for a comprehensive assessment of the financial soundness of banks in Bangladesh. The FSIs, designed to look over the health and stability of financial institutions, include key variables such as asset quality, non-performing loans as a percentage of total gross loans, return on assets (ROA), return on equity (ROE), earnings and profitability metrics for the banking sector.

Table 1: List of variables

Financial Soundness Indicators			
Variable	Type	Format	Description
Deposit Takers	Percent	Numeric	Deposit taker institution
Asset Quality	Percent	Numeric	Asset quality
Non-performing Loans to total gross loans	Percent	Numeric	Determined by dividing Non-Performing Loans (NPL) by the overall value of the loan portfolio, which comprises both performing and non-performing loans, and is calculated before subtracting specific loan loss provisions.
Return on Assets (ROA)	Percent	Numeric	This is found by dividing pre-tax net income, excluding extraordinary items, by the average total assets during the same period.
Return on Equity (ROE)	Percent	Numeric	This is determined by dividing the net income before extraordinary items and taxes by the average total capital over the same period.
Profitability and Earnings	Percent	Numeric	Profitability and earnings
Capital Adequacy	Percent	Numeric	Capital adequacy
Capital to Risk-Weighted Assets	Percent	Numeric	This is calculated by dividing total regulatory capital by risk-weighted assets.
Sources: IMF, FSI databases			

Global Financial Development (GFD) database:

The Global Financial Development Database (GFD) is a comprehensive and extensive dataset encompassing characteristics of financial system for 214 economies. As of its last update in September 2019, it contains data hub comprising 109 indicators that capture various facets of financial markets and institutions. Among the primary explanatory variables of interest in this dataset are those that measures bank competition. These variables include C5 (where higher values indicate lower competition), the Lerner index (higher values suggesting lesser competition), the H-statistic (higher values indicating more competition), and the Boone indicator (higher values signifying greater competition). These variables serve as key components for assessing the competitive landscape within the banking sector. Furthermore, the dataset includes variables

that measure access to banking services. These variables encompass bank accounts per 1,000 adults, bank branches per 100,000 adults, ATMs per 100,000 adults, automated teller machines (ATMs) per 100,000 adults, debit card ownership (% of the population aged 15+), credit card ownership (% of the population aged 15+), and the number of borrowers from commercial banks per 1,000 adults.

We analyzed that the above stated indicators provide insights into the accessibility of banking services within the studied economies. In particular, the dataset provides metrics which measure the depth of the banking sector. These include accounts per 1000 adults, Bank Branches Per 100,000 Adults , ATMs per 100,000 Adults GFD, Automated teller machines(ATMs) per 100,000 Adults, Debit Card percentage (Age 15+), Credit Card percentage (Age 15+), Borrowers From Commercial Banks (per 1000 Adults), bank return on equity (ROE)

before and after tax (expressed as percentages), bank return on assets (ROA) before and after tax (expressed as percentages), bank capital to assets ratio, bank capital to total assets ratio, bank deposits as a percentage of GDP, bank net interest margin, bank nonperforming loans as a percentage of gross loans, and bank nonperforming loans as a percentage of total gross loans. These depth indicators offer a comprehensive view of the financial health and performance of banking institutions within the dataset.

Model Specification

Two distinct models are executed in the research to explore the underlying relationships if bank competition affects financial inclusion and thereby bank performance in the economy. These models are designed to investigate how competition affects financial inclusion as well as bank performance.

Model 1: $Yi\ (\text{Bank Accounts}) = \alpha_0+\beta_1 Comp+ \beta_2 Branch+\beta_3\ ATMS+\beta_4 Others$

Model 2: $Yi\ (ROA) =\alpha_0+\beta_1 Comp+ \beta_2 Branch+\beta_3 NPL \text{ to total gross loans } +\beta_4\ Others$

Explanatory variables

Dependent Variable

Return on Asset (ROA) is a financial ratio that indicates the proportion of profit generated by a bank in relation to its total assets. This metric is computed by dividing the net income, which is obtained from the company's income statement and represents the profit after accounting for taxes, by the total assets as reported on the balance sheet. ROA is expressed as a percentage (%), serving as a measure of the bank's profitability relative to its asset base. We know that Return on Assets (ROA) = Net Income/Total Asset. In addition, we know that that bank account is a financial account maintained by a bank or other financial institution. This metric represents the number of financial accounts held with banks or other financial institutions per 1,000 adults in a given population. The equation of bank account Per 1000 Adults is: (1000 x Reported number of Depositors) / Adult Population in reporting country.

Independent Variables

Bank competition: The discussion on bank competition is presented below:

C5 indicator - The C5 indicator signifies the combined market share controlled by the top five financial institutions within a country. It serves as a basic measure of competition. Studies in industrial organization show, through game-theoretic models of collusion, that increased concentration usually results in higher prices and reduced output or overall societal welfare. In competitive behaviour measurement, concentration plays an imperfect role. For example, the Bertrand model, even without differentiated goods, or the contestable market theory (Baumol, Panzar & Willig, 1988), demonstrates the potential for a perfectly competitive market scenario where prices align with marginal cost, despite operating within a monopolistic or duopolistic market structure. Hence, additional measures of competition associated with the behavior of companies are essential to supplement the C5 indicator.

Panzar-Rosse H-statistic (H-Statistic)-The H-statistic measures the sensitivity of bank interest revenues to changes in input prices. The H-statistic is calculated in two steps. Initially, conducting a regression involves analysing the logarithm of gross total revenues (or the log of interest revenues) in relation to logarithmic measurements of input prices within banks. Subsequently, aggregating the estimated coefficients obtained for each input price is the subsequent step.

Input prices encompass various components: the cost of deposits (interest expenses to total deposits), labor costs (personnel expenses to assets), and capital costs for equipment and fixed assets (other operating and administrative expenses to total assets). In addition, we find that in terms of interpretation, elevated values of the H-statistic are linked with banking systems characterized by higher competitiveness. Specifically, a monopoly situation tends to yield an H-statistic that could either be negative or zero. On the other hand, monopolistic competition tends to generate values falling between 0 and 1, while perfect competition generally results in values exceeding 1.

Lerner Index- The Lerner Index quantifies the disparity between output prices and marginal costs concerning price, representing the inverse of the demand elasticity in a perfect monopoly scenario and registering as zero (L=0) in a perfectly competitive market. Consequently, increased values of the Lerner Index signify lower levels of competition within the banking sector. It's important to note that the Lerner index is bounded and can never surpass a value of one.

Booner Indicator - The Boone Indicator, introduced by Boone in 2008, demonstrates the impact of efficiency on profits. It is computed as the elasticity of profits concerning marginal costs. The primary concept behind the Boone indicator is that banks operating more efficiently tend to attain greater profits. As a result, a more negative Boone indicator signifies a higher degree of competition within the market. The range of Booner indicator is -0.3 to 0.24. The H-statistic, Lerner index, and Boone indicators have considerable data requirements, as they rely on input prices or production costs at the bank level in GFD (Global Financial Database). Bank Branch per 100,000 adults refers that bank branch is a physical location of a banking corporation. It is calculated as :

$$\frac{\text{(Number of institutions+ Number of branches)* 100,000}}{\text{Adult population in the reporting country.}}$$

ATM per 100,000 adults- ATMs are set for every 100,000 adults in the reporting country. Calculated as :

$$\frac{\text{(Number of ATMs)*100,000}}{\text{Adult population in the reporting country.}}$$

Other independent variables which are mainly considered as control variables are- Interest Rate Spread, Z-score, Debit Card percentage (Age 15+), Credit Card percentage (Age 15+), no account due to financial services being too expensive, young adults, borrowed money in past year, and other adults.

TEST RESULTS & ANALYSIS

In this section, we provide the test results, discussions, and possible implications of our study. We execute different empirical tests to examine if bank competition significantly influences financial inclusion and thereby market value of the banks. With that end view, we present the rest results and findings based on multiple regression analysis. In addition, we provide a thoughtful discussion to reflect on the academic and practical implications of the study findings in the context of the most recent of the state.

Descriptive Statistics

In this study, necessary data have been collected regarding financial inclusion and competition indicators from all banks in Bangladesh. The analysis presents key statistical measures, including means, standard deviations, maximum, and minimum values, for these indicators within the country's banking industry.

Table 2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev.
Bank Accounts Per 1000 Adults	120	511.93	715.07	598.14	88.11
Bank Branches Per 100,000 Adults	120	7.65	8.58	8.12	0.36
ATMs per 100,000 Adults GFD	120	3.92	8.07	6.18	1.67
ATMs per 100,00 Adults	120	4.05	8.87	6.74	1.84
Inflation, GDP Deflator	120	5.6	8.16	6.5	0.93
Debit Card(% Age 15+)	120	2.27	6.2	4.55	2.03
Credit Card(% Age 15+)	120	0.2	0.95	0.5	0.4
Borrowed any money in the past year, young adults (% age 15-24)	120	33.03%	43.00%	38.01%	4.99%
Borrowed any money in the past year, older adults (% age 25+)	120	38.23%	64.00%	51.71%	12.92%
No account because financial services are too expensive (% without account, age 15+)	120	16.21%	25.00%	20.07%	4.49%
Bank ROE(%, After Tax)	120	-4.29	16.03	8.77	7.07
Bank ROA(%, After Tax)	120	-0.35	1.3	0.74	0.59
Lerner Index	120	-0.09	0.33	0.12	0.2
H-statistic	120	0.53	0.86	0.74	0.14
Boone Indicator	120	-0.06	-0.02	-0.04	0.02
C5 Indicator	120	33.8	37.69	36.14	1.33

Over a decade, the banking industry exhibited significant data trends. The mean number of bank accounts per 1000 adults is 598.14, with a standard deviation of 88.11, demonstrating consistent growth ranging between a minimum of 511.93 and a maximum of 715.07. Correspondingly, the average number of bank branches per 100,000 adults showed stability at 8.12, with a standard deviation of 0.36. The branch figures fluctuated mildly, ranging from a minimum of 7.65 to a maximum of 8.58. Additionally, the average number of ATMs per 100,000 adults indicated a mean of 6.18, with a standard deviation of 1.67. The range for ATMs spanned from a minimum of 3.92 to a maximum of 8.07. These statistics underscore the industry's expansion and consistent provision of essential services over the decade. The data collected over the same period also covered financial rates and indicators. The inflation rate averaged at 6.50, with a standard deviation of 0.93, fluctuating between 5.60 and 8.16. Moreover, debit card usage averaged at 4.55, with a standard deviation of 2.03, ranging from 2.18 to 6.20. Credit card usage, with a mean of 0.50 and a standard deviation of 0.40, ranged between 0.20 and 0.95. Borrowing rates varied considerably: young adults (15-24) averaged at 38.01%, ranging between 33.03% and 43.00%, while older adults (25 and above) averaged at 51.71%, ranging from 38.23% to 64.00%. These diverse rates underscore the financial behaviors and preferences within different age groups.

Analysing the banking market performance over the decade revealed several crucial indicators. The Return

on Equity (ROE) averaged at 8.77, with a standard deviation of 7.07, ranging from -4.29 to 16.03. Similarly, the Return on Assets (ROA) averaged 0.74, with a standard deviation of 5.89, fluctuating between -0.35 and 1.30. The Lerner Index, at a mean of 0.12 and a standard deviation of 1.99, spanned from -0.09 (signifying high competition) to 0.33. Furthermore, the H-Statistic averaged at 0.74, with a standard deviation of 1.45, indicating variations between 0.53 (suggesting high competition) and 0.86 (indicating monopolistic competition). The Boone Indicator reflected a mean of -0.04, with a standard deviation of 0.02, varying between -0.06 and -0.25. Lastly, the C5 Indicator showcased a mean of 36.14, with a standard deviation of 1.33, signifying the presence of large banks dominating the market within the range of 33.79 to 37.69. These indicators portray the market's competitive dynamics and the dominance of certain banking entities over the observed period. This initial summary of 'descriptive statistics' signals about the possible stated outcome of the that greater competition can increase the probability of having financial inclusions, and thereby better banking performances. This implies that greater competition among banks is a positive force for engaging more people into the financial system, enhancing profits, and thereby ensuring better financial inclusion in the economy.

Correlation

This correlation matrix illustrates the underlying relationships between financial inclusion and banking competition measurements within the banking sector. Additionally, it provides insights into the internal connections among the dependent and independent variables of the study.

Table 3: Correlation Matrix

		Bank Accounts Per 1000 Adults	Bank Branches Per 100,000 Adults	ATMs per 100,000 Adults GFD	ATMs per 100,00 Adults	Inflation, GDP Deflator	Debit Card (% Age 15+)	Credit Card (% Age 15+)	Borrowed by young adults (% age 15-24)	Borrowed by older adults (% age 25+)	Bank ROE (%, After Tax)	Bank ROA (%, After Tax)	Lerner Index	Boone Indicator	Interest Rate Spread	C5 Indicator	Z-score
Bank Accounts Per 1000 Adults	Pearson Correlation	1	.792**	.6927**	.729**	-0.329	0.891	-0.751	-0.693	-0.78	0.015	0.004	-0.676	0.381	0.705	-0.731	-0.1
	Sig. (2-tailed)		0.008	0.081	0.007	0.524	0.095	0.141	0.076	0.127	0.478	0.595	0.324	0.619	0.118	0.099	0.849
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Bank Branches Per 100,000 Adults	Pearson Correlation	.724**	1	.794**	.795**	-0.591	0.664	-0.642	-1.000**	-.597*	0.329	0.322	-.268*	0.587	0.548	-.860*	0.181
	Sig. (2-tailed)	0.008		0	0	0.217	0.172	0.218	0.001	0.05	0.525	0.534	0.032	0.113	0.26	0.028	0.731
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
ATMs per 100,000 Adults GFD	Pearson Correlation	.727**	.894**	1	1.000**	-0.608	0.694	-0.683	-0.688	-0.872	0.319	0.319	-.759*	0.844	0.559	-0.803	0.21
	Sig. (2-tailed)	0.008	0.003		0	0.2	0.071	0.117	0.1	0.151	0.538	0.538	0.041	0.156	0.249	0.054	0.69

	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Automated teller machines (ATMs) per 100,00 Adults	Pearson Correlation	.629**	.595**	1.000**	1	-0.688	0.693	-0.681	-0.689	-0.774	0.318	0.317	-.759*	0.844	0.373	-0.807	0.206
	Sig. (2-tailed)	0.007	0.002	0.001		0.087	0.077	0.124	0.093	0.144	0.54	0.541	0.041	0.156	0.41	0.052	0.695
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Inflation, GDP Deflator	Pearson Correlation	-0.329	-0.591	-0.608	-0.688	1	-0.844	0.881	0.673	0.611	-0.678	-0.714	0.646	-.895**	0.024	0.546	-0.74
	Sig. (2-tailed)	0.524	0.217	0.2	0.087		0.36	0.313	0.53	0.581	0.139	0.111	0.054	0.005	0.56	0.262	0.095
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Debit Card(% Age 15+)	Pearson Correlation	0.889	0.864	0.794	0.793	-0.844	1	-.697*	-0.664	-0.54	-0.463	-.699*	-1.000**	1.000**	.699*	-0.747	-0.67
	Sig. (2-tailed)	0.095	0.172	0.071	0.077	0.36		0.047	0.17	0.221	0.173	0.028	.	.	0.024	0.463	0.537
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Credit Card(% Age 15+)	Pearson Correlation	-0.875	-0.842	-0.783	-0.781	0.881	-.897*	1	0.742	0.613	0.68	1.000*	1.000**	-1.000**	-.899*	0.697	0.609
	Sig. (2-tailed)	0.141	0.218	0.117	0.124	0.313	0.047		0.217	0.268	0.126	0.019	.	.	0.023	0.509	0.583
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Borrowed any money young adults (% age 15-24)	Pearson Correlation	-0.793	-1.000**	-0.788	-0.789	0.673	-0.964	0.942	1	0.797	0.858	0.952	1.000**	-1.000**	-0.654	0.696	0.839
	Sig. (2-tailed)	0.076	0.001	0.1	0.093	0.53	0.17	0.217		0.051	0.343	0.198	.	.	0.194	0.292	0.366
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Borrowed any money by older adults (% age 25+)	Pearson Correlation	-0.88	-.897*	-0.772	-0.774	0.611	-0.74	0.713	0.697	1	0.814	0.724	1.000**	-1.000**	-0.727	0.829	0.88
	Sig. (2-tailed)	0.127	0.05	0.151	0.144	0.581	0.221	0.268	0.051		0.394	0.25	.	.	0.245	0.241	0.315
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Bank ROE(%,	Pearson Correl	0.015	0.329	0.319	0.318	-0.678	-0.863	0.88	0.858	0.814	1	.897**	-0.478	0.622	-0.57	-0.39	.819**

After Tax)	ation																
	Sig. (2-tailed)	0.878	0.525	0.538	0.54	0.139	0.173	0.126	0.343	0.394		0	0.522	0.378	0.237	0.444	0.01
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Bank ROA(%, After Tax)	Pearson Correlation	0.004	0.322	0.319	0.317	-0.714	-.799*	1.000*	0.852	0.824	.897**	1	-0.531	0.668	-0.557	-0.364	.642**
	Sig. (2-tailed)	0.795	0.534	0.538	0.541	0.111	0.028	0.019	0.198	0.25	0		0.469	0.332	0.251	0.478	0.005
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Lerner Index	Pearson Correlation	-0.676	-.768*	-.659*	-.759*	0.746	-1.000**	1.000**	1.000**	1.000**	-0.478	-0.531	1	-0.639	-0.243	0.756	-0.68
	Sig. (2-tailed)	0.324	0.032	0.041	0.041	0.054	0.193	0.126	0.343	.	0.522	0.469		0.061	0.757	0.244	0.316
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Boone Indicator	Pearson Correlation	0.381	0.887	0.844	0.844	-.995**	1.000**	-1.000**	-1.000**	-1.000**	0.622	0.668	-0.939	1	0.069	-0.933	0.756
	Sig. (2-tailed)	0.619	0.113	0.156	0.156	0.005	0.581	0.221	0.268	0.051	0.378	0.332	0.061		0.931	0.067	0.244
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Interest Rate Spread	Pearson Correlation	0.705	0.548	0.559	0.373	0.024	.999*	-.999*	-0.954	-0.927	-0.57	-0.557	-0.243	0.069	1	-0.372	-0.57
	Sig. (2-tailed)	0.118	0.26	0.249	0.41	0.96	0.024	0.023	0.194	0.245	0.237	0.251	0.757	0.931		0.468	0.238
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
C5 Indicator	Pearson Correlation	-0.731	-.860*	-0.803	-0.807	0.546	-0.747	0.697	0.896	0.729	-0.39	-0.364	0.756	-0.633	-0.372	1	-0.13
	Sig. (2-tailed)	0.099	0.028	0.054	0.052	0.262	0.463	0.509	0.292	0.241	0.444	0.478	0.244	0.067	0.468		0.809
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
Z-score	Pearson Correlation	-0.101	0.181	0.21	0.206	-0.737	-0.665	0.609	0.839	0.88	.719**	.742**	-0.684	0.756	-0.57	-0.128	1
	Sig. (2-tailed)	0.849	0.731	0.69	0.695	0.095	0.537	0.583	0.366	0.315	0.01	0.005	0.316	0.244	0.238	0.809	
	N	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The correlation analysis presented in Table-3 delves into the relationship between financial inclusion and competition indicators within the banking industry. Typically ranging from +1 to -1, correlation coefficients indicate both the strength and direction of relationships. The findings reveal intriguing connections. For instance, financial inclusion measured by debit card usage shows a negative correlation with the Lerner Index but exhibits a strong positive relationship with the Boone indicators. Moreover, borrowing by young adults (15-24 years) in the past year displays a negative correlation with the number of bank branches per 100,000 adults, a strong positive relationship with the Lerner Index, and a negative association with the Boone Indicator. Additionally, financial inclusion via credit card usage indicates a strong positive correlation with the Lerner Index but a negative relationship with the Boone indicators. Similarly, borrowing by young adults (25+ years) in the past year demonstrates a strong positive correlation with the Lerner Index and a negative correlation with the Boone Indicator. Interestingly, the financial indicator ROA (After tax) showcases a robust positive relationship with financial inclusion measured through credit card usage (% age 15+). However, no significant relationship is observed between ROA (After tax) and ROE (After tax), as well as ATM per 100,000 and bank branches per 100,000.

The analysis also highlights intriguing dynamics between financial inclusion metrics and competition indicators in the banking sector. Notably, diverse relationships emerge, such as the contrasting effects seen in debit and credit card usage concerning the Lerner Index and Boone indicators. Borrowing behaviors among different age groups also reveal distinctive associations with competition metrics, emphasizing nuanced patterns in financial inclusion dynamics. Furthermore, the positive correlation observed between ROA (After tax) and credit card usage for financial inclusion underlines potential implications for profitability concerning specific inclusion measures. However, certain indicators, such as ROE (After tax) and the relationship between ATMs and bank branches, do not show significant correlations, indicating distinct facets warranting deeper investigation within the complex interplay of financial inclusion and competitive dynamics. This initial summary of ‘correlation matrices’ signals about the possible stated outcome of the that greater competition can increase the probability of having financial inclusions, and thereby better banking performances.

Results & implication

In this section, the regression outputs are summarized in the following Table-4. We analyze that multiple R being the correlation coefficient indicates how strong the linear relationship is between the corresponding variables. In this study, the multiple Ra is 0.927 or 92.7% and Rb 0.992 or 99.2% suggesting that there is clear relationship between dependent and independent variables. It indicates that there is significantly positive nexus between bank competition & financial inclusion.

Table 4: Regression Analysis for the Model-1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.927[a]	0.86	0.832	33.01248	0.86	30.621	1	5	0.003
2	.992[b]	0.985	0.97	13.92596	0.125	12.549	2	3	0.035

a. Predictors: (Constant), ATMs per 100,000 Adults GFD

b. Predictors: (Constant), ATMs per 100,000 Adults GFD, Z-score, H-statistic

c. Dependent Variable: Bank Accounts Per 1000 Adults

As presented, the Coefficient of Determination, denoted as R^2, reveals how many data points align with the regression line. It shows how much of the variation in the dependent variable can be explained by the

indepen-

dent variable. In this analysis, R^2 is 86% and 98.50%, meaning that 86% and 98.50% of the variation in the dependent variable is accounted for by the independent variable. Additionally, the Adjusted R^2 signifies the percentage of variation explained by only the independent variables that directly affect the dependent variable. In this regression, the adjusted R^2 a is 83.20% and R^2 b is 97% indicates how much the independent variables clarify the variation in the dependent variable. These test results also refer that bank competition significantly influences financial inclusion of the economy.

Table 5: Overall F test (Model 1): ANOVAa

Model		Sum of Square	Df	Mean Square	F	Sig.
1	Regression	33371.29	1	33371.29	30.62	.003[b]
	Residual	5449.12	9	1089.82		
	Total	38820.42	10			
2	Regression	38238.62	5	12746.21	65.73	.003[c]
	Residual	581.79	5	193.93		

a. Dependent Variable: Bank Accounts Per 1000 Adults

b. Predictors: (Constant), ATMs per 100,000 Adults GFD

c. Predictors: (Constant), ATMs per 100,000 Adults GFD, Z-score, H-statistic

The Significance of F in regression analysis indicates the likelihood that the regression results could have occurred randomly. A low Significance of F confirms the reliability of the regression output. From this table we can see that the overall F test a value is 0.003, which is less than α (0.05), and b value is 0.003, which is less than α (0.05). So, we can say that at least one independent variable has a linear relationship with the dependent variable. 0.003>0 and 0.003>0; therefore we can say greater competition increases the probability of banking product inclusion. The outcome is that greater competition can increase the probability of having financial inclusions, and thereby better banking performances. Hence, greater competition among banks is a positive force for engaging more people into the financial system, enhancing profits, and thereby ensuring better financial inclusion in the economy.

Table 6: Coefficients and p-value (Model 1):Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	295.71	56.06		5.28	0.003	151.6	439.82
	ATMs per 100,000 Adults GFD	48.92	8.84	0.93	5.53	0.003	26.2	71.65
2	(Constant)	655.98	83.6		7.85	0.004	389.93	922.03
	ATMs per 100,000 Adults GFD	48.44	4.1	0.92	11.81	0.001	35.4	61.5
	H-statistic	163.03	62.72	0.21	2.6	0.08	-362.65	36.6
	Z-score	33.84	7.07	0.36	4.79	0.017	-56.34	-11.35

a. Dependent Variable: Bank Accounts Per 1000 Adults

In the table, it is evident that the coefficients for ATM per 100,000, Z-score indicator, and H-statistic hold positive values, indicating a positive relationship with Bank Accounts per 1000. Moreover, when we examine the individual p-values of these independent variables, we find that they are all at a very low value of 0.001. This suggests a strong relationship between ATM per 100,000 and Bank accounts per 1000 adults,

rendering these variables as statistically significant.

Regression Analysis for the Model 2:

Table 7: Regression Statistics (Model 2): Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.949[a]	0.9	0.88	0.19	0.9	45.2	1	5	0.001
2	.995[b]	0.99	0.98	0.08	0.09	12.53	2	3	0.04

a. Predictors: (Constant), NPLs to Total Gross loans

b. Predictors: (Constant), NPLs to Total Gross loans, H-statistic, Z-score

c. Dependent Variable: Bank ROA(%, After Tax)

Multiple R signifies the strength of the linear relationship indicating as a correlation coefficient in the model. In this study, the multiple Ra stands at .949 or 94.9% and Rb .995 or 99.5%, indicating a meaningful relationship between dependent and independent variables. The Coefficient of Determination, denoted as R^2, reflects the proportion of data points that align with the regression line. It measures how much of the variation in the dependent variable can be explained by the independent variable. In this regression R^2 a is 90.00% and R^2 b is 98.90%. That means 90.00% and 98.90% of the variation of dependent variable around the mean is explained by independent variable. Furthermore, the Adjusted R^2 represents the percentage of variation explained solely by the independent variables that actively influence the dependent variable. In this regression, the adjusted R^2 a is 88.00% and R^2 b is 97.90%, demonstrating the extent to which the independent variables clarify the variation in the dependent variable.

Table 8: Overall F test (Model 2): ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.56	1	1.56	45.2	.001[b]
	Residual	0.17	9	0.04		
	Total	1.74	10			
2	Regression	1.73	5	0.57	92.9	.002[c]
	Residual	0.03	5	0.006		
	Total	1.74	10			

a. Dependent Variable: Bank ROA(%, After Tax)

b. Predictors: (Constant), NPLs to Total Gross loans

c. Predictors: (Constant), NPLs to Total Gross loans, H-statistic, Z-score

Significant F indicates the probability that the Regression output could have been obtained by chance. A low significance of F confirms the reliability or validity of the regression output. From the table we can see that the overall F test a value is 0.01 which is equal to α 0.01and b value is 0.002, which is less than α (0.05). So, we can say that at least one independent variable has a linear relationship with the dependent variable. Here, we find that, 0.001>0 and 0.002>0, so we claim that greater competition increase the probability of having banking performance in the economy.

Table 9: Coefficients and p-value (Model2) Coefficients a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.7	0.52		5.23	0.003	-4.03	-1.37
	NPLs to Gross loans	0.4	0.06	0.95	6.72	0.001	0.25	0.56
2	(Constant)	4.45	0.42		10.55	0.002	-5.8	-3.11
	NPLs to Gross loans	0.27	0.06	0.64	4.49	0.021	0.08	0.47
	H-statistc	1.27	0.34	0.24	3.77	0.033	0.19	2.34
	Z-score	0.27	0.09	0.43	3.08	0.054	-0.009	0.56

a. Dependent Variable: Bank ROA(%, After Tax)

In the table, it is evident that the coefficients for NPLs to Total Gross, Z-score indicator, and H-statistic are positive, indicating a positive relationship with Bank ROA (after tax). Moreover, when we examine the individual p-values of these independent variables, we find that they are all at a reasonably low value of 0.021. This suggests a strong relationship between NPLs to Total Gross and Bank ROA, making these variables statistically significant.

The implication of the above test results is that greater competition among banks is a positive force for engaging more people into the financial system, enhancing profits, and thereby ensuring better financial inclusion in the economy. Since, more competitive environment will increase the probability of better performance, it is quite expected for the investors to be more inclined for making further investment in banking sector. Due to increased competition, mass-customers will have more privileges for receiving better financial services. While greater competition fosters financial inclusion and potentially leads to wealth maximization, the perception of higher risk associated with additive bank performance could impact investment strategies. Investors might need to carefully assess and adjust their portfolios after considering the risk-return trade-off. In a highly performing sector, the investors might feel the necessity of an additional risk premium in a highly competitive environment. While competition can boost cash flow, therefore, achieving a balanced mix for optimal outcomes remains the key for prudent investors to navigate and succeed in this competitive landscape. However, for future direction, we recommend that the study should extend the analysis to multiple countries to improve the generalizability of findings; and future research may incorporate longer and more recent datasets to capture changing banking trends.

CONCLUSION

Now-a-days, the underlying nexus among bank competition, financial inclusion and bank performance is supposed to be the focal issue to comprehend the paradigm shift of financial system. Hence, with meta-analysis, critical review and empirical evidence, this academic novelty addresses the ongoing pivotal issue that healthy competition within the banking industry has a significant impact on financial inclusion as well as economic development. Overall, the test results document that greater competition can increase the probability of having banking inclusions, and thereby better banking performances in the economy. In particular, enhancing access to financial services has emerged as a significant policy objective both at the global and national levels.

Market-oriented strategies have been employed to achieve this goal, with a focus on leveraging new technologies, such as digital banking, mobile banking, school banking, ATMs, point-of-sale (POS) services, and agent banking, among others to make financial services more accessible, affordable, and widespread. Therefore, greater competition among banks is a positive force for engaging more people into the financial system, enhancing profits, and thereby ensuring better financial inclusion in the economy. Since, more competitive environment will increase the probability of better performance, it is quite expected for the investors to be more inclined for making further investment in banking sector.

The findings reveal a substantial and positive influence of competition on the adoption of various financial products in the emerging economy. This competition also has positive ramifications for the country's economic growth and long-term development. Two key shifts in the banking industry are poised to bolster competition in the financial sector, and further enhancing financial inclusion. First, the financial sector is undergoing a significant transformation due to innovative and efficient technologies, paving the way for new products, processes, and service providers such as FinTech. Simultaneously, financial markets are becoming more interconnected globally.

Both of these factors are expected to drive progress in financial inclusion in the future. In recent years, the economy anticipates that FinTech plays an expanding role in delivering financial services. The financial sector holds substantial growth potential, and the opportunity to advance financial inclusion is substantial. Therefore, we claim that this paper adds significant value to the literature of bank competition and FinTech, because the study clearly provides an analysis with empirical evidence on the impact of bank competition on financial inclusion & bank performances. Therefore, this academic novelty considerably contributes to regime of digitalized paradigm shift in banking industry; and thereby to confirm the optimal financial inclusion for wealth maximization.

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Appendix: Meta-Analysis Sample

Sl.	Authors	Year	Journal	Purpose	Methodology	Type	Findings
1	Agarwal, S., Song, C., & Yao, V.	2022	NBER Working Paper	Investigating how increased competition among banks affects their pricing strategies for adjustable-rate mortgages (ARMs).	Quasi-natural experiment design, Placebo Regression.	Empirical study, Quantitative research.	Banking deregulation increases competition, prompting banks to shroud key pricing terms in ARM contracts, exploiting consumer inattention, resulting in lower initial rates offset by shrouded fixed terms and margins.
2	Adhamovna, B. G.	2016	International Journal of Management Science and Business Administration	Defining and proposing the determining variables of banking competition through literature review on bank competition.	Survey Study	Literature analysis.	The significance of potential factors influencing bank competition varies across diverse markets due to differences in market concentration, the number of banks, and macroeconomic conditions and inter-industry dynamics.
3	Akhunjonov, U., & Adhamovna, B. G.	2016	SAARJ Banking & Insurance Research	Identifying the relationship between the bank instability features. including bank runs, asymmetric information, contagion and their influence on financial crises under moderating impact of	Literature Analysis	Qualitative study	Understanding the key factors behind financial crises provides policymakers with valuable insights to develop effective strategies for addressing similar situations in the future.

				competition.			
4	Anginer, D., Demirguc-Kunt, A., & Zhu, M	2014	Journal of financial Intermediation	Determining the relationship between bank competition and systemic risk.	Survey Study	Qualitative study with event analysis	A robust institutional framework, enabling effective public and private financial regulation, mitigates the adverse impacts of competition absence.
5	Avom, D., Bangake, C., & Ndoya, H.	2022	Applied Economics	Investigating the relationship between banking concentration and financial inclusion	Principal Component Analysis (PCA), and Panel Smooth Transition Regression (PSTR)	Empirical study, quantitative analysis.	Initially, bank concentration has a negative effect, but beyond a certain threshold, it becomes positive. This relationship is influenced by factors such as financial freedom, mobile phone penetration, property rights protection, control of corruption, and regulatory quality.
6	Bose, S., Bhattacharyya, A., & Islam, S.	2016	Journal of Banking and Finance Law and Practice.	Measuring the level of financial inclusion disclosures in the annual reports and explore the potential determinants of such disclosures.	FII analysis, Regression analysis.	Empirical study, quantitative analysis.	Financial inclusion is positively influenced by banking firm size, growth opportunities, institutional investors, audit committee size, and the presence of religion-based operations in the bank.
7	Chinoda, T., & Kapingura, F. M.	2023	Economies	Investigating the impact of digital financial inclusion and bank competition on bank stability and their significance for financial stability and sustainable economic growth.	Panel data Regression analysis, S-GMM.	Quantitative analysis.	Digital financial inclusion positively impacts bank stability and reduces non-performing loans, while increased bank competition negatively affects bank stability.
8	De Cesari, A., Gilder, D., Huang, W., & Onali, E	2023	Journal of Money, Credit and Banking.	Analyzing the impact of market contestability by exploiting plausibly exogenous changes in interstate geographical restrictions on branch expansion of banks.	Regression analysis.	Quantitative analysis	Banks would adapt to shifts in charter values due to market contestability.
9	Ditta, A. S. A., & Saputra, A.	2020	Accounting, Finance and Auditing Studies	Examining the impact of financial inclusion and banking performance in Indonesia.	Panel data, regression, F-Statistics,	Quantitative analysis	Various financial inclusion indicators can enhance banking performance, reflected in improved ROA and NIM ratios, enabling banks to increase profitability.
10	Goel, S., & Sharma, R	2017	Procedia computer science	Introducing a comprehensive financial inclusion index for India, bridging the gap for weaker sections and	Calculation of Financial Inclusion Index (FII).	Empirical study, Quantitative analysis.	Enhanced access to the financial system for marginalized groups drives a nation towards higher economic growth.

				fostering economic growth by enhancing their access to financial services.			
11	González, F.	2016	Journal of Corporate Finance	Finding the impact of the global financial crisis on corporate investment across countries depending on the protection of creditor rights and bank market competition.	Survey Study	Qualitative study with event analysis	The results remain robust when considering alternative specifications, crisis time frames, adjustments in the study's country scope, and alternative measures for bank reliance, creditor rights, and banking industry competition.
12	Jiang, E. X., Yu, G. Y., & Zhang, J.	2022	Working Paper: Sim Kee Boon Institute for Financial Economics.	Investigating the impact of digital disruption on bank competition, particularly considering consumer digital preferences.	Empirical econometric analysis and structural modeling.	Empirical and structural research.	Digital disruption prompts branch-reliant banks to target non-tech-savvy customers with higher prices, potentially limiting branch options and markups for this group.
13	Jungo, J., Madaleno, M., & Botelho, A.	2022	Journal of Risk and Financial Management	Assessing the impact of financial inclusion and competitiveness on banks' financial stability, with a focus on the moderating role of financial regulation, in Sub-Saharan African (SSA) and Latin American and Caribbean (LAC) countries.	Principal component analysis (PCA), Kaiser-Meyer-Olkin test (KMO), Panel unit root test	Empirical study, quantitative analysis.	Financial inclusion positively affects bank stability in SSA and LAC countries, with financial regulation playing a moderating role, but it can increase credit risk and reduce bank profitability in LAC countries.
14	Kouladoum, J. C., Wirajing, M. A. K., & Nchofoung, T. N.	2022	African Governance and Development Institute (AGDI) Working Paper. Telecommunications Policy.	Examining the impact of digital technology indicators on financial inclusion, employing statistical techniques.	Robust test, Panel Data Regression (GMM), PCA Analysis, IV-TOBIT regression.	Empirical study, Quantitative analysis.	Digital technology indicators, including internet penetration, phone subscriptions, fixed broadband, and an ICT composite indicator, have a positive and statistically significant impact on various measures of financial inclusion.
15	Liebersohn, J.	2017	Unpublished working paper. Massachusetts Institute of Technology.	Examining the impact of bank competition on commercial lending.	Regression analysis, HHI comparison analysis.	Quantitative analysis.	Increased competition leads to shifts in loan recipients toward larger, safer businesses, shedding light on the effects of antitrust rules on banking practices.
16	Maghfuriyah, A., Azam, S., & Shukri, S.	2019	Management Science Letters	Analyzing the impact of market structure and behavior on Islamic banking performance by using the Structure Conduct Performance.	Structure Conduct Performance (SCP) analysis	Quantitative analysis.	Market structure significantly shapes bank competition, and the short-term performance of Islamic banking is closely linked to the volatility of its external financing market share, while its

							long-term success is also influenced by this factor.
17	Mirzaei, A., & Moore, T.	2014	International Financial Markets, Institutions and Money,	Examining the determinants of bank competition across 146 countries.	GMM, Panel data Regression Analysis.	Quantitative analysis	In underdeveloped banking systems, contestability and institutional growth enhance competitiveness, while advanced banking systems benefit from inter-industry competition and financial independence.
18	Moyo, B., & Sibindi, A. B.	2022	Journal Of African Business	Assessing bank competition's impact on access to credit for informal firms.	Binary choice Probit model estimation.	Quantitative analysis	Bank competition, measured by the Lerner index and concentration ratios, reduces the probability of informal firms accessing finance.
19	Nguyen, T. D., & Du, Q. L. T.	2022	Cogent Economics & Finance	Examining the impact of financial inclusion on bank stability in ASEAN countries.	Panel data regression, 3d - IFI (index of financial inclusion)	Exploratory quantitative analysis.	Financial inclusion positively impacts bank stability in ASEAN countries.
20	Shah, S. M., & Ali, A.	2022	Journal of Policy Research	Providing a comprehensive literature review and analysis of factors influencing financial inclusion across nations and regions, with a focus on its significance for economic development.	Literature analysis.	Empirical Study.	Financial inclusion is crucial for reducing income inequality and promoting economic growth, but many individuals worldwide remain excluded from the formal financial system.
21	Shihadeh, F. H., Hannon, A. M., Guan, J., Ul Haq, I., & Wang, X.	2018	Global tensions in financial markets	Finding the relationship between financial inclusion and banks performance.	OLS regression, Robust test.	Quantitative analysis	Financial inclusion enhances bank efficiency and profitability, incentivising banks to allocate more capital towards its improvement.
22	Yakubu, I. N., & Musah, A.	2022	Journal of Sustainable Finance & Investment.	Investigating the relationship between financial inclusion and bank profitability in Sub-Saharan Africa from 2000 to 2017, emphasizing the need for policies that align financial inclusion efforts with strategies to enhance banking sector profitability.	GMM, Principal component analysis (PCA)	Empirical study, Quantitative analysis	Financial inclusion negatively influences bank profitability in Sub-Saharan Africa, particularly in the post-global financial crisis period.