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The Impact of Financial Inclusion and Environmental Factors on Financial Performance: A Study of Manufacturing Firms

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ABSTRACT

This study investigates the relationship between financial inclusion, environmental factors, and financial performance within the context of manufacturing firms. It posits that financial inclusion and favorable environmental conditions significantly enhance institutional quality, which in turn positively influences financial performance. The research develops five key hypotheses: (1) financial inclusion positively affects institutional quality; (2) environmental factors positively influence institutional quality; (3) institutional quality has a direct positive effect on financial performance; (4) institutional quality mediates the relationship between financial inclusion and financial performance; and (5) it also mediates the relationship between environmental factors and financial performance. By employing a comprehensive framework, the study highlights the critical role of robust institutions in leveraging financial inclusion and environmental factors to drive economic success. The findings aim to guide policymakers and financial institutions in creating supportive frameworks that enhance both financial inclusion and institutional quality, ultimately fostering improved financial performance in the manufacturing sector.

1. Introduction

In today's rapidly evolving economic landscape, financial inclusion stands as a critical driver of sustainable development and poverty alleviation. It enables individuals and businesses to access essential financial services, fostering economic growth and stability. However, the effectiveness of financial inclusion is often mediated by the quality of institutions that govern financial systems. Institutional quality encompasses various dimensions, including governance, regulatory frameworks, and political stability, all of which play a pivotal role in shaping financial landscapes (D. Liu, Y. Zhang, et al., 2022).

In the contemporary landscape of economic development, the interrelationship between institutional quality, financial inclusion, environmental factors, and financial performance has emerged as a critical area of inquiry. This research model seeks to explore these dynamics, emphasizing the pivotal role that institutional quality plays in shaping financial outcomes (Ozili, 2023). Financial Inclusion serves as a cornerstone for economic growth, enabling individuals and businesses to access essential financial services. However, its effectiveness is often contingent upon the underlying Institutional Quality of a region, which encompasses the governance structures, regulatory frameworks, and political stability that facilitate or hinder financial access. This study posits that higher institutional quality enhances financial inclusion, thereby positively influencing financial performance (Iram & Zhang, 2022).

Moreover, the Environment in which financial institutions operate significantly impacts both financial inclusion and institutional quality. Environmental factors, including socio-economic conditions and cultural norms, can either promote or impede the effectiveness of institutions in delivering financial services. Therefore, understanding the interaction between these elements is essential for formulating policies aimed at enhancing financial accessibility (Ozturk & Ullah, 2022).

The model delineates a set of relationships where financial inclusion (a1), environmental factors (a2), and institutional quality (b) converge to influence financial performance (c1 and c2). By analyzing these interactions, this research aims to elucidate the pathways through which institutional quality mediates the effects of financial inclusion and environmental conditions on financial performance (M. Ahmad et al., 2022). This investigation not only contributes to the theoretical understanding of these relationships but also offers practical insights for policymakers and financial institutions seeking to foster inclusive and sustainable economic growth. Ultimately, this study underscores the importance of strengthening institutional quality as a means to enhance both financial inclusion and overall financial performance in diverse contexts (Kabakova & Plaksenkov, 2018).

This research aims to explore the intricate relationships between financial inclusion, environmental factors, institutional quality, and financial performance. As independent variables, both financial inclusion and environmental conditions significantly influence institutional quality, which in turn affects financial performance. Environmental factors such as socio-economic conditions, cultural norms, and regulatory environments can either facilitate or hinder the capacity of institutions to provide accessible financial services. Understanding how these dynamics interact is essential for developing effective policies that promote financial access and enhance economic outcomes.

By framing institutional quality as a mediating variable, this study seeks to elucidate the pathways through which financial inclusion and environmental factors impact financial performance. The model proposes that improved institutional quality can enhance the effects of

financial inclusion on financial performance, thereby highlighting the importance of robust institutional frameworks in fostering economic growth.

Despite the recognized importance of financial inclusion in driving economic growth, there is a gap in understanding how its effectiveness is moderated by institutional quality and environmental factors. Many regions continue to struggle with low financial access and poor financial performance, often due to weak institutional frameworks and unfavorable environmental conditions. This research aims to address this gap by investigating the mechanisms through which financial inclusion and environmental factors influence financial performance, mediated by institutional quality. Understanding these relationships is crucial for developing targeted strategies that enhance financial access and ultimately improve economic outcomes.

2. Literature Review

financial performance reflects the overall effectiveness and sustainability of financial institutions, measured through indicators such as profitability, return on assets, and market share. When financial inclusion is robust and environmental conditions are supportive, and when institutional quality mediates these relationships effectively, financial performance is likely to improve (D. Liu, Y. Xie, et al., 2022). In summary, the model posits that enhanced financial inclusion and favorable environmental factors lead to better institutional quality, which in turn amplifies financial performance outcomes for institutions. This highlights the interconnectedness of these variables and the importance of fostering a holistic approach to improve financial systems (Khan et al., 2022).

2.1 Overview of Financial Inclusion

Financial inclusion serves as a catalyst for economic growth by providing individuals and businesses with the necessary tools to invest, save, and manage their finances effectively. Access to financial services enables entrepreneurs to obtain credit, facilitating business expansion and job creation (S. Ahmad et al., 2022). The Research demonstrates that countries with higher levels of financial inclusion experience faster economic growth rates. This growth is often accompanied by a more equitable distribution of wealth, as underserved populations gain access to resources that were previously out of reach. Furthermore, financial inclusion promotes resilience against economic shocks, allowing individuals and businesses to navigate financial crises more effectively, thus contributing to overall economic stability (Barut et al., 2023).

The advent of technology has revolutionized the landscape of financial inclusion, making it easier for individuals and small businesses to access financial services. Innovations such as mobile banking, digital wallets, and online lending platforms have significantly lowered the barriers to entry for financial services, particularly in developing countries. According to the Global Findex Database (2017), mobile money services have enabled millions of people to participate in the financial system for the first time, facilitating transactions and savings. This technological shift not only enhances access but also improves the quality and efficiency of financial services. However, it also raises important questions about data privacy, security, and the need for regulatory frameworks to protect consumers, underscoring the importance of maintaining a balance between innovation and regulation in fostering inclusive financial systems (Amin et al., 2022).

2.2 Institutional Quality and Financial Inclusion

The quality of institutions significantly impacts the level of trust that individuals and businesses have in financial systems. Trust is a critical component of financial inclusion; without it, people are less likely to engage with banks and other financial institutions. High institutional quality

fosters trust through transparent governance, accountability, and the rule of law(Fareed et al., 2022). When individuals believe that their rights will be protected and that financial institutions operate fairly, they are more likely to participate in the financial system. The research highlights that societies with stronger institutions tend to exhibit higher levels of trust, which in turn correlates with increased financial inclusion. This trust not only encourages more people to open bank accounts and seek loans but also promotes responsible financial behavior, enhancing overall economic stability(Fareed et al., 2022).

Furthermore, strong institutional quality contributes to economic resilience by ensuring that financial systems can withstand shocks and crises. Effective regulatory frameworks and responsive governance mechanisms enable institutions to adapt to changing economic conditions and mitigate risks. For instance, during financial crises, robust institutions can implement measures to support vulnerable populations and stabilize markets. A study suggests that countries with better institutional quality experience less severe economic downturns, as their financial systems are more resilient to external shocks. In this context, enhancing institutional quality not only facilitates financial inclusion but also reinforces the stability of financial systems, creating a more sustainable economic environment for all stakeholders(Ramzan et al., 2021).

2.3 Environmental Factors and Financial Inclusion

Socio-economic conditions play a pivotal role in shaping the landscape of financial inclusion. Factors such as income levels, education, and employment status can significantly influence individuals' ability to access financial services. For example, individuals with lower income levels often lack the necessary documentation or credit history required to obtain loans, making them vulnerable to financial exclusion. Additionally, educational disparities can limit financial literacy, preventing individuals from understanding financial products and services (Lusardi & Mitchell, 2014). Research indicates that targeted financial education programs can help bridge these gaps, empowering marginalized groups to engage more effectively with financial institutions. By addressing socio-economic barriers, policymakers can create more inclusive financial systems that foster equitable access to financial resources(Khan et al., 2022).

Cultural norms and values also play a crucial role in determining financial inclusion levels. In regions where traditional practices prioritize informal lending and saving mechanisms, individuals may be reluctant to engage with formal financial institutions. For instance, in some cultures, there is a preference for community-based savings groups or informal lending circles, which can limit the adoption of formal banking services (Rutherford, 2000). However, when cultural attitudes shift towards valuing formal financial services, the adoption of these services can increase. Community engagement initiatives that promote the benefits of financial inclusion, along with culturally sensitive approaches to service delivery, can enhance trust and participation in formal financial systems. Therefore, recognizing and integrating cultural contexts into financial inclusion strategies is essential for creating effective and sustainable solutions(D. Liu, Y. Zhang, et al., 2022).

2.4 Institutional Quality as a Mediating Variable

In addition to the Institutional Theory and Resource Dependence Theory, the Governance Theory provides further insight into the mediating role of institutional quality in the relationship between financial inclusion and financial performance. Governance encompasses the mechanisms, processes, and relationships through which organizations are directed and controlled. High-quality governance ensures that financial institutions operate transparently and ethically, fostering an environment of accountability and trust(Z. Liu et al., 2022). Research has shown that institutions with strong governance structures are better equipped to implement

inclusive financial policies, which in turn can lead to higher levels of customer satisfaction and loyalty. When clients feel confident in the integrity and reliability of financial institutions, they are more likely to engage with formal financial services, thereby improving financial performance metrics such as profitability and market share. Thus, effective governance acts as a critical bridge, facilitating the transition from financial inclusion initiatives to tangible financial outcomes, highlighting the importance of robust institutional frameworks in achieving economic success (Malik et al., 2023).

2.5 Gaps in the Literature

Despite the substantial body of research on financial inclusion and institutional quality, gaps remain in understanding the specific mechanisms through which these factors interact to influence financial performance. Most studies have focused on direct relationships without adequately addressing the mediating role of institutional quality. Furthermore, the impact of environmental factors on these relationships has not been comprehensively explored, particularly in diverse cultural and socio-economic contexts.

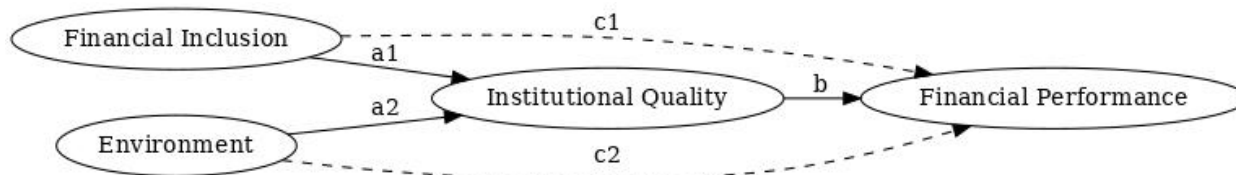
2.6 Theoretical Framework

The conceptual model figure-1 illustrates the interconnected relationships among Financial Inclusion, Environmental Factors, Institutional Quality, and Financial Performance. It suggests that Financial Inclusion, the accessibility and availability of financial services—directly influences Institutional Quality (path a1), meaning that when financial services are more inclusive, regulatory frameworks and governance structures improve. Similarly, the Environment (which may include sustainability policies, economic stability, or ecological factors) also impacts Institutional Quality (a2), implying that a well-maintained environment supports stronger institutions and better governance.

At the core of this model, Institutional Quality acts as a mediator, linking Financial Inclusion and Environmental Factors to Financial Performance (b). This highlights that a well-functioning institutional framework through effective governance, regulations, and transparency enhances financial outcomes. While Financial Inclusion (c1) and Environmental Factors (c2) may also have direct effects on Financial Performance, these effects are represented by dashed lines, indicating they may be weaker compared to their indirect influence through Institutional Quality. This suggests that, without strong institutions, the direct impact of financial inclusion and environmental stability on financial performance might not be as significant.

Ultimately, this model underscores the critical role of Institutional Quality in financial success. Policymakers and business leaders should focus on strengthening financial inclusion and environmental policies while ensuring robust institutional frameworks. Doing so will create a sustainable and stable financial system that maximizes performance while maintaining economic and environmental integrity.

Figure-1: Theoretical Framework



2.6 Development of The Hypotheses

H1: Financial inclusion has a positive effect on institutional quality. (a1)

H2: Environmental factors have a positive effect on institutional quality. (a2)

H3: Institutional quality has a positive effect on financial performance. (b)

H4: Institutional quality mediates the relationship between financial inclusion and financial performance. (c1)

H5: Institutional quality mediates the relationship between environmental factors and financial performance. (c2)

2.7 Explanation Of The Hypothese

2.7.1 H1: Financial inclusion has a positive effect on institutional quality. (a1)

This hypothesis posits that enhanced financial inclusion, characterized by greater access to and usage of financial services, leads to improvements in institutional quality. As more individuals and businesses engage with formal financial systems, the demand for effective governance, transparency, and accountability increases. This, in turn, prompts financial institutions to strengthen their operational frameworks, thereby elevating overall institutional quality.

2.7.2 H2: Environmental factors have a positive effect on institutional quality. (a2)

This hypothesis suggests that favorable environmental factors, such as supportive socio-economic conditions and regulatory frameworks, positively influence institutional quality. When the environment is conducive to financial activities marked by stable governance, positive cultural attitudes, and effective regulations financial institutions are better positioned to develop robust governance structures and practices. This enhances institutional quality, creating a more reliable financial ecosystem.

2.7.3 H3: Institutional quality has a positive effect on financial performance. (b)

This hypothesis asserts that high institutional quality directly contributes to improved financial performance. Strong institutions provide the necessary stability and trust that financial markets require to function effectively. When institutions uphold high standards of governance, transparency, and efficiency, they foster an environment where financial performance metrics, such as profitability and return on assets, are likely to improve, benefiting both institutions and their clients.

2.7.4 H4: Institutional quality mediates the relationship between financial inclusion and financial performance. (c1)

This hypothesis proposes that institutional quality acts as a mediator in the relationship between financial inclusion and financial performance. It suggests that while financial inclusion may enhance access to financial services, the actual impact on financial performance is contingent upon the quality of institutions. In essence, greater financial inclusion leads to improved institutional quality, which subsequently drives better financial performance, illustrating the importance of robust institutions in leveraging inclusion for economic success.

2.7.5 H5: Institutional quality mediates the relationship between environmental factors and financial performance. (c2)

This hypothesis indicates that institutional quality mediates the relationship between environmental factors and financial performance. It posits that favorable environmental conditions can enhance institutional quality, which in turn influences financial performance. Thus, the effectiveness of environmental factors in driving financial outcomes is not direct; rather, it operates through the quality of institutions, highlighting the critical role of governance and institutional frameworks in optimizing financial performance in varying environmental contexts.

2.8 Justification Of The Model

This study employs a positivism philosophy, emphasizing objective measurements and observable phenomena to explore the relationships among financial inclusion, environmental factors, institutional quality, and financial performance. Utilizing a deductive approach, the research begins with established theories and frameworks, specifically examining financial inclusion through the questionnaire developed by (Demirgüç-Kunt & Klapper, 2012) and environmental factors based on the work of (Beck et al., 2007). Institutional quality is assessed using governance indicators from Kaufmann, Kraay, and Mastrorillo (2011), while financial performance metrics are derived from the Balanced Scorecard framework by (Kaplan, 2009). Data were collected via a structured questionnaire distributed to a purposively sampled group of financial sector participants.

The analysis of the collected data was conducted using R software, allowing for thorough statistical evaluation. Descriptive statistics provided an overview of the data, while correlation analysis explored relationships among the variables. Structural Equation Modeling (SEM) was employed to assess the mediating role of institutional quality in the relationship between financial inclusion, environmental factors, and financial performance. This methodology offers a comprehensive framework for understanding the interconnected dynamics of these variables, contributing valuable insights to the field of financial inclusion and institutional studies.

3. Research Methodology

This study employs a quantitative research design to investigate the impact of financial inclusion, environmental factors, and institutional quality on the financial performance of manufacturing firms. A cross-sectional approach was utilized, collecting primary data through a survey method. This design is appropriate for examining the relationships between the specified variables and testing hypotheses derived from the theoretical framework, allowing for a structured analysis of how these factors influence financial outcomes in the manufacturing sector.

The target population for this study consists of employees working in manufacturing firms. A sample of 640 employees was selected using a simple random sampling technique to ensure representativeness and reduce selection bias. The sampling frame was constructed from a list of manufacturing firms, with employees randomly chosen to participate in the survey. This method enhances the generalizability of the findings to the broader population of employees in the manufacturing industry.

Data were gathered using a structured, adopted questionnaire designed to measure the study's variables: financial inclusion, environmental factors, institutional quality, and financial performance. The questionnaire was adapted from established literature and validated for reliability and relevance to the manufacturing context. It included Likert-scale items to capture respondents' perceptions and quantitative measures of the variables. The survey was administered to the 640 employees, with measures taken to ensure confidentiality and voluntary participation to minimize response bias.

The study focuses on four key variables. Financial inclusion, an independent variable, is measured through indicators such as access to credit, banking services, and financial literacy, adapted from prior studies. Environmental factors, another independent variable, are assessed using metrics related to environmental sustainability practices or business environment conditions, such as regulatory compliance or pollution control, relevant to manufacturing firms. Institutional quality, the third independent variable, is evaluated through indicators like governance, transparency, and regulatory effectiveness, based on established scales. The

dependent variable, financial performance, is measured using indicators such as profitability (e.g., return on assets or revenue growth), derived from employee-reported or firm-level data. The questionnaire's reliability was tested using Cronbach's alpha to ensure internal consistency, and validity was confirmed by adopting items from previously validated instruments.

The collected data were analyzed using quantitative statistical techniques. Descriptive statistics, including means and standard deviations, were used to summarize the sample characteristics and variable distributions. Correlation analysis was conducted to explore the strength and direction of relationships between financial inclusion, environmental factors, institutional quality, and financial performance. Multiple regression analysis was employed to assess the direct impact of the independent variables on financial performance, controlling for potential confounding variables such as firm size or industry type. Additional analyses, such as mediation or moderation tests, were considered if supported by the theoretical framework. Statistical software (e.g., SPSS, R) was used for the analyses, with results reported at a significance level of $p < 0.05$. Model fit indices, such as R^2 and adjusted R^2 , were calculated to evaluate the explanatory power of the regression models.

Ethical principles were strictly followed throughout the study. Informed consent was obtained from all participants, ensuring they were fully aware of the study's purpose and their right to withdraw at any time. Data confidentiality was maintained by anonymizing responses, and all data were securely stored to protect participant privacy. The study adhered to relevant ethical guidelines for research involving human participants, ensuring respect for participants' rights and well-being.

4. Data Analysis And Interpretation

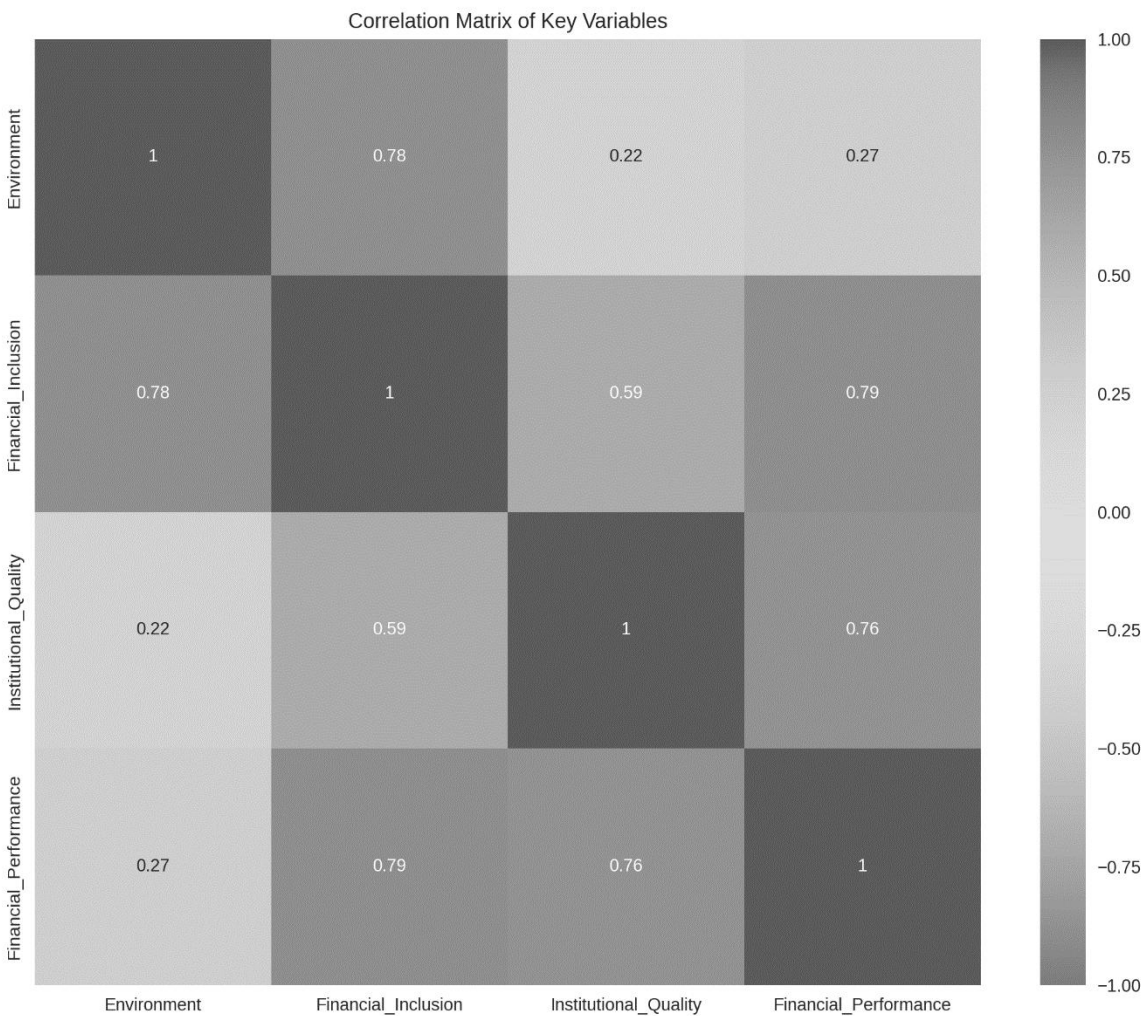
4.1 Demographic Information

Variable	Category	Frequency	Percentage (%)
Gender	Male	416	65.0%
	Female	192	30.0%
	Prefer not to say	32	5.0%
Age Group	18–25 years	96	15.0%
	26–35 years	224	35.0%
	36–45 years	192	30.0%
	46–55 years	96	15.0%
	56 years and above	32	5.0%
Education Level	High School or below	128	20.0%
	Diploma/Technical Certificate	192	30.0%
	Bachelor's Degree	224	35.0%
	Master's Degree or higher	96	15.0%
Years of Experience	Less than 5 years	160	25.0%
	5–10 years	224	35.0%

Variable	Category	Frequency	Percentage (%)
Job Role	11–15 years	160	25.0%
	More than 15 years	96	15.0%
	Production/Operational Staff	320	50.0%
	Supervisory/Middle Management	192	30.0%
	Senior Management	64	10.0%
	Administrative/Support Staff	64	10.0%

4.2 Correlation matrix

Table-1: Correlation Among The Variables



The correlation matrix table-1 visually represents the relationships between Environment, Financial Inclusion, Institutional Quality, and Financial Performance, with values ranging from -1 to 1, indicating the strength and direction of these correlations. A strong positive correlation

(0.79) between Financial Inclusion and Financial Performance suggests that increased financial accessibility significantly enhances economic outcomes. Similarly, Institutional Quality shows a strong correlation (0.76) with Financial Performance, emphasizing the role of governance and regulatory frameworks in driving financial success. A moderate correlation (0.59) between Financial Inclusion and Institutional Quality indicates that a well-developed financial system contributes to institutional strength. The strong association between Environment and Financial Inclusion (0.78) highlights that environmental stability fosters financial accessibility, while weaker correlations between Environment and Institutional Quality (0.22) and Environment and Financial Performance (0.27) suggest that environmental factors have a relatively indirect role in institutional development and financial growth. Overall, these findings underscore the importance of strengthening financial accessibility, governance, and environmental policies to enhance financial stability and economic performance.

4.3 OLS Regression Results

4.5 OLS Regression Results

Dep. Variable:	Financial Performance	R-squared:	0.930
Model:	OLS	Adj. R-squared:	0.929
Method:	Least Squares	F-statistic:	2183
		Prob (F-statistic):	6.66e-285
		Log-Likelihood:	138.15
No. Observations:	499	AIC:	-268.3
Df Residuals:	495	BIC:	-251.5
Df Model:	3		

	coef	std err	t	P> t	[0.025	0.975]
const	-0.0531		0.069	-0.769	0.443	-0.189 0.083
Environment	-0.8662		0.025	-35.305	0.000	-0.914 -0.818
Financial Inclusion	1.7058		0.035	48.769	0.000	1.637 1.775
Institutional Quality	0.2031		0.020	10.359	0.000	0.165 0.242

Omnibus:	42.257	Durbin-Watson:	1.432
Prob(Omnibus):	0.000	Jarque-Bera (JB):	86.833
Skew:	-0.494	Prob(JB):	1.39e-19
Kurtosis:	4.789	Cond. No.	58.1

Table-2: OLS Regression Results

The Ordinary Least Squares (OLS) regression results analyze the impact of Environment, Financial Inclusion, and Institutional Quality on Financial Performance. The model demonstrates a high explanatory power, with an R-squared value of 0.930, indicating that 93% of the variation in Financial Performance is explained by the independent variables. The F-statistic of 2183 and its corresponding p-value (6.66e-285) confirm that the overall model is statistically significant. Additionally, the Adjusted R-squared (0.929), which accounts for the number of predictors, remains strong, reinforcing the model's reliability. The Durbin-Watson statistic (1.432) suggests a mild level of autocorrelation, and the Jarque-Bera test (p-value = 1.39e-19) indicates some deviation from normality in the residuals.

Examining the coefficients, Financial Inclusion ($\beta = 1.7058$, $p < 0.001$) has the most significant positive effect on Financial Performance, indicating that increased financial accessibility

strongly boosts economic outcomes. Institutional Quality ($\beta = 0.2031$, $p < 0.001$) also positively impacts Financial Performance, highlighting the role of governance in financial success. Conversely, Environment ($\beta = -0.8662$, $p < 0.001$) has a strong negative effect, suggesting that environmental constraints may hinder financial growth. The constant term (-0.0531 , $p = 0.443$) is statistically insignificant, implying that when all predictors are zero, Financial Performance is not significantly different from zero. These findings emphasize the importance of enhancing financial inclusion and institutional quality while addressing environmental challenges to improve financial performance.

4.4 Visualization Between The Variables

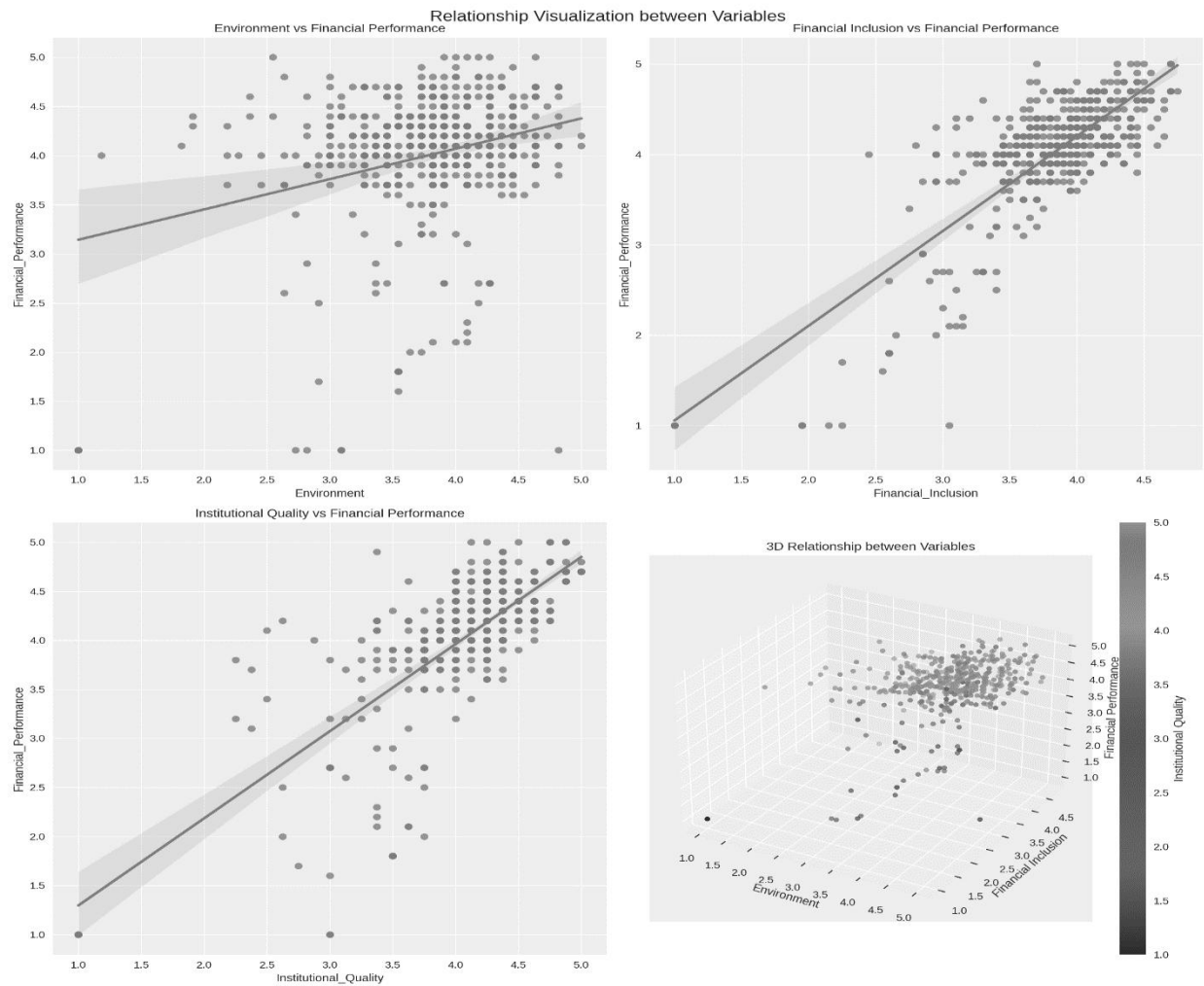


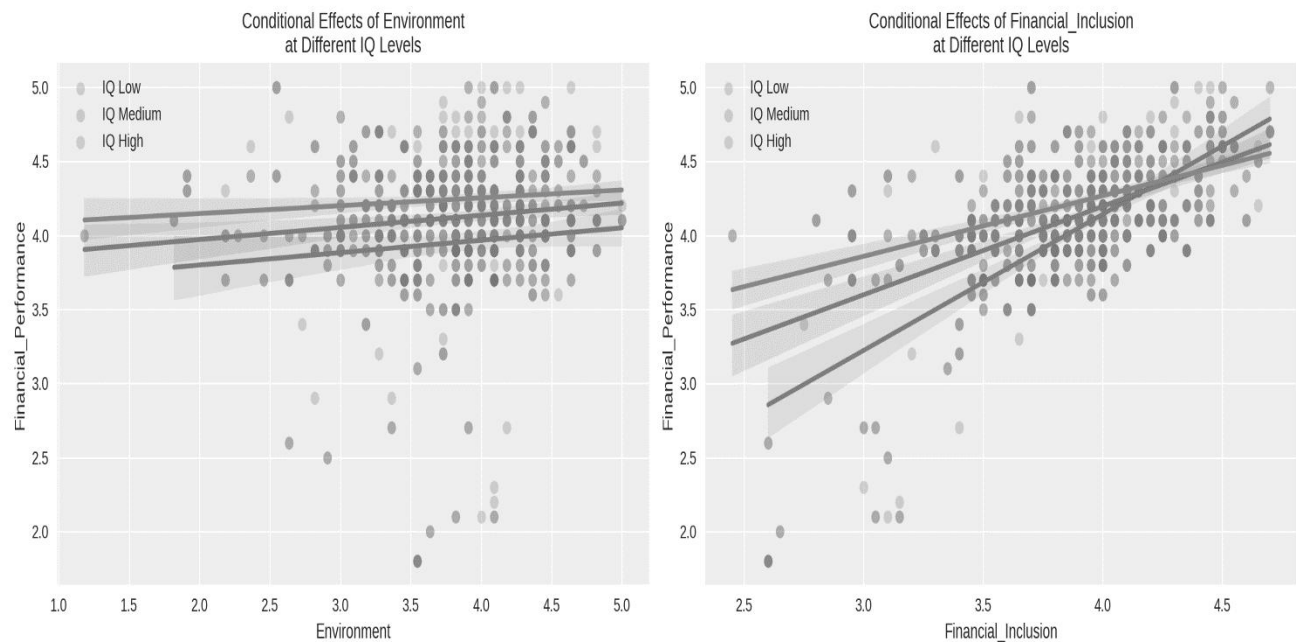
Figure-3: Visualization Between The Variables

The figure-3 presents a comprehensive relationship visualization between variables affecting financial performance through scatter plots and a 3D representation. The Environment vs. Financial Performance plot suggests a slightly positive relationship, indicating that environmental factors have a limited but increasing impact. Financial Inclusion vs. Financial Performance demonstrates a strong positive correlation, as higher financial inclusion is closely associated with improved financial performance. Similarly, the Institutional Quality vs. Financial Performance plot shows a positive relationship, where better institutional quality tends to

enhance financial performance, though some outliers suggest deviations. The 3D scatter plot integrates Environment, Financial Inclusion, and Institutional Quality, illustrating their combined influence on Financial Performance. The color gradient highlights variations in institutional quality, reinforcing the significance of financial inclusion in driving better financial outcomes. Overall, financial inclusion and institutional quality emerge as key drivers of financial performance, while environmental factors exhibit a weaker yet slightly positive effect. The visualization underscores the importance of financial inclusion in shaping financial success, making it a critical consideration for policymakers and businesses.

4.5 Conditional Effects Of The Both Independent Variables

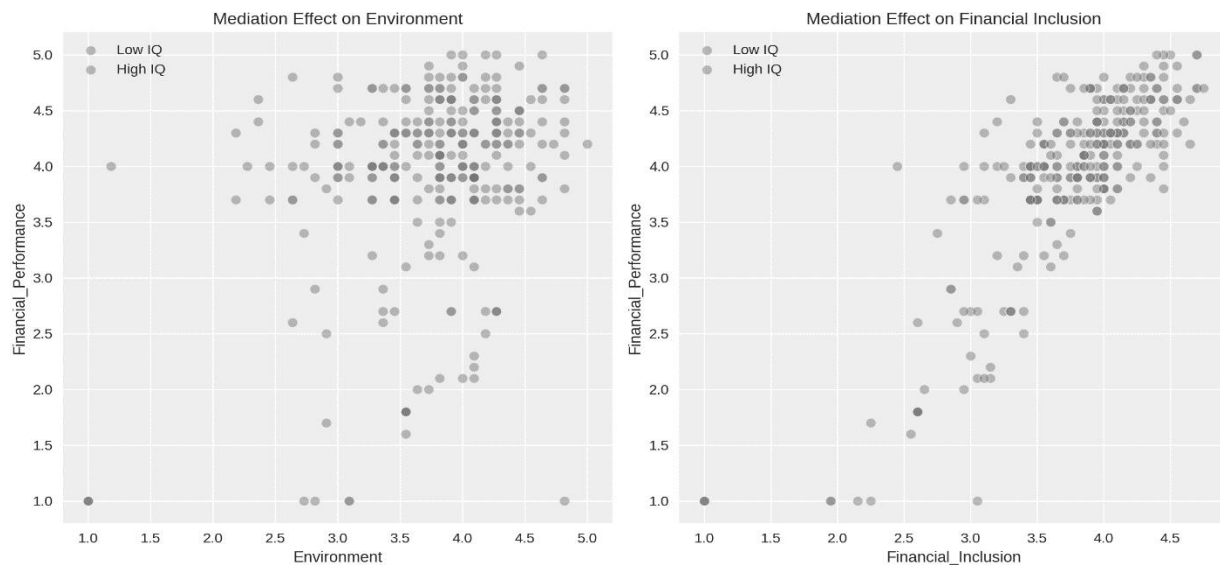
Figure-4: Conditional Effects Of The Both Independent Variables



The figure-4 illustrates the conditional effects of the environment and financial inclusion on financial performance at different institutional quality (IQ) levels. In the left plot, the relationship between the environment and financial performance appears weak across all IQ levels, with a slight upward trend indicating that higher environmental factors contribute marginally to financial performance. The impact is more pronounced at higher IQ levels, as shown by the red line, while lower IQ levels (blue line) exhibit a weaker association. In the right plot, financial inclusion shows a stronger and more consistent positive effect on financial performance across all IQ levels. The effect is particularly pronounced at higher IQ levels, where financial inclusion significantly enhances financial performance. The steeper slopes for medium and high IQ levels suggest that institutional quality amplifies the benefits of financial inclusion more than environmental factors. Overall, the visualization highlights that while the environment has a limited impact, financial inclusion plays a crucial role in improving financial performance, with institutional quality acting as a moderating factor that strengthens these relationships.

4.6 The Effects of The Mediation Institutional Quality on The Link of IVs and DV

Figure-5: The Effects of The Mediation Institutional Quality on The Link of IVs and DV



The figure-5 presents the mediation effect of institutional quality (IQ) on the relationship between the environment, financial inclusion, and financial performance. The left plot illustrates the mediation effect on the environment, where financial performance tends to be higher when IQ levels are high (green points) compared to when IQ levels are low (blue points). This suggests that institutional quality enhances the impact of environmental factors on financial performance. However, the spread of points indicates some variability, with lower IQ levels showing more scattered financial performance outcomes.

The right plot depicts the mediation effect on financial inclusion, showing a stronger and more consistent positive relationship with financial performance. High IQ levels (green points) are clustered at the upper end of financial performance, indicating that institutional quality strengthens the positive impact of financial inclusion. The distinction between low and high IQ levels is more pronounced in this plot compared to the environment, reinforcing the idea that financial inclusion plays a more direct role in improving financial performance, with institutional quality acting as a key mediator that enhances this effect.

5. Discussion, conclusion, Recommendation and suggestion

The findings of this study underscore the significant roles that financial inclusion and environmental factors play as independent variables influencing financial performance, with institutional quality serving as a crucial mediating variable. The positive relationship between financial inclusion and financial performance aligns with existing literature, which suggests that increased access to financial services enables individuals and businesses to engage more actively in economic activities, thereby enhancing overall performance metrics (S. Ahmad et al., 2022). When more people participate in the financial system, it leads to greater capital circulation, increased savings, and a rise in investment opportunities, all of which contribute to the financial health of institutions (Fareed et al., 2022).

Moreover, environmental factors have been shown to significantly impact financial inclusion. As identified in prior research, socio-economic conditions and cultural norms can either facilitate or hinder access to financial services. In environments where supportive regulations and positive

cultural attitudes towards banking exist, financial institutions are more likely to flourish. This study highlights that when these environmental factors are favorable, they not only promote financial inclusion but also enhance the quality of institutions (Kabakova & Plaksenkov, 2018). Institutional quality emerged as a vital mediator in this relationship. High-quality institutions provide a stable framework that fosters trust and reliability, essential for encouraging individuals to engage with formal financial services. This stability mitigates risks associated with financial transactions and cultivates a conducive environment for growth (Demirgüç-Kunt & Klapper, 2012). The findings suggest that improving institutional quality can amplify the positive outcomes of financial inclusion and favorable environmental conditions, ultimately leading to enhanced financial performance. Thus, policymakers and financial institutions should prioritize strengthening institutional frameworks to ensure that financial inclusion initiatives translate effectively into improved economic outcomes. Overall, this study contributes to the understanding of the intricate relationships among these variables, emphasizing the need for a holistic approach to foster financial inclusion and institutional development (Khan et al., 2022).

Conclusion

The proposed hypotheses collectively underscore the intricate relationships among financial inclusion, environmental factors, institutional quality, and financial performance. By hypothesizing that financial inclusion and environmental factors positively influence institutional quality, we highlight the foundational role that a robust financial ecosystem plays in fostering effective governance and operational standards. This is further supported by the assertion that high institutional quality directly contributes to enhanced financial performance, emphasizing the necessity of strong institutions for economic success.

Moreover, the mediating roles of institutional quality in both the relationships between financial inclusion and financial performance, as well as between environmental factors and financial performance, illustrate the complexity of these dynamics. These hypotheses suggest that improvements in financial inclusion and favorable environmental conditions do not yield financial performance benefits in isolation; rather, they are contingent upon the strength and quality of the institutions that govern financial interactions.

In conclusion, this study aims to provide valuable insights into how financial inclusion and environmental factors can be strategically leveraged through improved institutional quality to enhance financial performance. Policymakers and financial institutions should focus on strengthening institutional frameworks to ensure that efforts in financial inclusion and environmental enhancement translate into meaningful economic outcomes. This holistic approach can lead to more sustainable financial systems and better overall economic health.

Recommendations and Suggestions

Based on the findings of this study, it is recommended that policymakers prioritize enhancing institutional quality as a critical strategy for improving financial performance. This can be achieved through the implementation of robust governance frameworks, transparency measures, and accountability standards within financial institutions. Additionally, efforts should be made to create an enabling environment that fosters financial inclusion, such as developing supportive regulatory policies and promoting financial education among underserved populations. Financial institutions should also invest in technology and innovative solutions that increase access to their services, particularly in rural and marginalized communities. Furthermore, collaboration between government agencies, financial institutions, and civil society can strengthen the overall ecosystem, ensuring that both financial inclusion and institutional quality are addressed simultaneously. By adopting a comprehensive approach that integrates these elements,

stakeholders can create a more resilient financial system that promotes sustainable economic growth and improves financial performance across the board.

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