

DOES INSTITUTIONAL QUALITY ENHANCE FINANCIAL INCLUSION? EVIDENCE FROM ASIAN AND EUROPEAN COUNTRIES

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Received Date: 01-04-26 Accepted Date: 30-06-26

Abstract

This study investigates the institutional-financial inclusion nexus across 62 Asian and European economies (2011–2024). Moving beyond single-proxy measures, we employ Principal Component Analysis (PCA) to construct robust, multidimensional indices for Financial Inclusion and Institutional Quality. Utilizing advanced panel estimators (PCSE and FGLS), the analysis reveals that good governance—specifically clear regulations and the rule of law—is a non-negotiable foundation for expanding financial services. Regional findings uncover a "diminishing returns" effect: while institutional reforms act as a powerful engine for growth in emerging Asian markets, they have a smaller impact in developed European countries where systems are already mature. We also found that while digital banking is spreading fast, it only works well when backed by solid "institutional scaffolding." These results debunk "one-size-fits-all" strategies. Developing regions should focus on fixing their institutions as a primary lever for inclusion, while advanced economies should prioritize innovation and competition policy to keep moving forward.

Keywords: Institutional Quality, Financial Inclusion, Principal Component Analysis.

1.0 Introduction

Financial inclusion has become a very important aspect of sustainable economic development in the 21st century. According to the definitions of the World Bank, financial inclusion can be defined as access to affordable and useful financial services and products that fulfil the needs of persons and businesses (World Bank, 2024). Though there has been substantial growth in the expansion of financial services worldwide, an estimated 1.7 billion adults are not banked, and the

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phenomenon is disproportionately high in the developing economies (Demirguc-Kunt et al., 2018). This unrelenting marginalization of formal financial systems continues to sustain income inequality, frustrate poverty alleviation, and limit the potential of economic growth (Hafalir & Loewenstein, 2009).

Financial inclusion dynamics in the Asian continent are one of the most interesting case studies. Asia is the home of some of the fastest-growing economies in the world and has outstanding heterogeneity in financial development performance. Whereas some countries like Malaysia and Thailand have recorded fairly high financial inclusion rates, some countries like Pakistan and Bangladesh still face a huge number of their citizens being unable to access basic financial services (ADB, 2021). This is despite the fact that in some instances the same level of economic development can be seen to be similar, which implies that other factors other than income might be important in explanations of the variation of financial inclusion outcomes.

The most recent research has shown that institutional quality as a possible determinant of financial inclusion has become a more and more popular topic of study. Economic incentives and transaction costs are the products of institutions, in the sense that they are rules of the game in the society (North, 1990), which influence the development of the financial sector. Good governance, regulatory frameworks, and legal institutions can provide settings that would enable the growth and innovation in the financial sector (Acemoglu et al., 2019). Nevertheless, the exact mechanisms that institutional quality has on financial inclusion are not sufficiently comprehended, especially in the case of emerging economies in Asia, where the institutional growth has been uneven.

The association between the quality of institutions and financial inclusion is especially topical due to the explosive digitalization of financial services in Asia. Digital payment systems, mobile money platforms, and fintech innovations could circumvent the conventional financial access obstacles, and the extent of their use and success can be determined by favorable institutional conditions (GSMA, 2024). The elucidation of the relationship between institutional quality, which eases or restricts these new pathways to financial inclusion, is an important knowledge gap in the literature and has important policy implications.

The current research fills these gaps by studying the connection between institutional quality and financial inclusion across 62 economies, 22 in Asia and 40 in Europe over a 14-year interval (2011-2024). This study is able to offer subtle information about how individual dimensions of institutional quality affect various factors of financial inclusion by concentrating on countries in varying levels of financial development and institutional evolution. Although previous research works have determined the connections between economic development and financial inclusion, the role of institutional quality has not been studied in detail, especially in the Asian context. It is important to understand this relationship because of a number of reasons. To begin with, institutional reforms reflect policy instruments that the governments can directly manipulate as opposed to demographic or geographic variables that also impact financial inclusion (Allen et al., 2014). Second, the accelerated financial digitalization of Asia has already provided new access to inclusion that can be especially delicate to institutional contexts (Jack and Suri, 2014). Third, the uneven experiences of the Asian economies using financial

inclusion offer an innate laboratory to test how the quality of the institutional setting interacts with other variables to determine the outcome of financial developments (Demirguc-Kunt et al., 2018). The results add to the theoretical knowledge in the determinants of financial inclusion as well as policy implementation in enhancing the inclusion of financial development in diverse economic settings.

2.0 Literature Review

The concept of financial inclusion has experienced a paradigm shift as opposed to its former concept, which mainly focused on the availability of credit to businesses (Claessens, 2006). Modern literature has expanded much further in its definition of financial inclusion, recognizing that it includes a wide range of financial services and consumers and hence is more representative of the phenomenon.

Demirguc-Kunt et al. (2018) conceptualize the term financial inclusion as access to and utilization of formal financial services in four dimensions that are interconnected (availability, accessibility, usage, and quality). This multidimensional model takes into consideration the fact that being in close proximity to financial services does not necessarily imply inclusion, but rather affordability, suitability, and actual use are also needed.

Financial inclusion has been undergoing development in its measurement as well as its conceptualization. The initial empirical studies have used proxy measures, including credit given to the private sector or even the number of bank branches per capita (Beck et al., 2007). The more recent methodologies use composite indices that describe several dimensions of inclusion.

A multidimensional index suggested by Sarma (2008), based on banking penetration, availability, and usage, and a multidimensional index that has been established by the World Bank in 2011, the Global Findex Database, has significantly enhanced the state of empirical studies by providing similar data on the level of individual use in countries (Demirguc-Kunt et al., 2018).

To focus on this study, we will focus on three key financial inclusion indicators, namely: account ownership (both mobile money accounts and traditional bank accounts), ATM penetration, and the density of bank branches. These indicators show different dimensions together, i.e., usage, digital access, and physical availability. Owning an account has often been viewed as the financial inclusion point through which people can access payment services, saving options, and credit products (Allen et al., 2014). ATM penetration and bank branch density refer to the physical infrastructure that allows access to the service, yet both might be declining in relevance in the context of digital alternatives dominating (GSMA, 2024).

There exists a great amount of literature that examines the connection between institutional quality and general financial development. It was determined by La Porta et al. (1997, 1998) that the origin of law and the strength of legal enforcement have a great impact on financial development, and the financial system of common-law jurisdictions is usually more advanced. Their results motivated the intensive investigation into the impact of institutional dimensions on performance in the financial sector. Levine (1999) added to this inquiry by investigating the effect of various aspects of institutional quality, such as the protection of property rights, the

enforcement of contracts, and the control of corruption on financial development. He proved that those countries that have better guarantees of property rights and more effective mechanisms of contract enforcement have deeper financial systems. The same conclusion was made by Aghion et al. (2005), who demonstrated that financial development is greater in countries where institutions protecting against expropriation and execution of contractual obligations are found. Recent research has given attention to the institutional quality impact on specific financial development aspects. Qian and Strahan (2007) discovered that improved creditor rights led to increased concentration in the banking system with high rates of loans and low non-performing loans. Barth et al. (2013) demonstrated that more stable banking systems relate to effective regulatory supervision. These results indicate that different dimensions of institutions can affect financial development in different ways. This literature has, however, covered financial development mainly in terms of depth or efficiency and not inclusion. The degree to which these insights are converted into financial inclusion, i.e., whether it is access and use and not aggregate size and efficiency, is thus a question open to the research.

The existence of research that directly correlates institutional quality with financial inclusion is relatively new, and its scope is not as extensive. Aghion et al. (2009) offered preliminary results that contract enforcement lowers income inequality, in part through greater access to finance by households with low income levels. Allen et al. (2014) examined the impacts of legal rights and credit-information sharing on financial inclusion in different countries and discovered that the higher the legal rights and comprehensive credit-information systems, the higher the rates of financial inclusiveness, particularly among marginalized populations. Klapper et al. (2014) also established that strong insolvency systems are associated with a higher rate of entrepreneurship, meaning that legal institutions that support a business exit can be used to encourage financial inclusion through entrepreneurial networks. More recently, Neaime and Gaysset (2018) studied a set of determinants of financial inclusion in countries of the Middle East and North Africa, and found that government effectiveness and quality of regulations play a significant role in determining the outcomes of inclusion. Park and Mercado (2015) found the quality of institutions, together with income and education, to be a major measure of financial inclusion in emerging economies of Asia.

All these studies are preliminary efforts that have shown a positive relationship exists between institutional quality and financial inclusion. However, there are a number of loopholes. First, the majority of studies use cross-sectional data, which are thus restricted in making cause-and-effect claims. Second, not many studies separate the effects of the individual institutional dimensions on a particular aspect of financial inclusion. Third, the processes through which institutional quality operates on financial inclusion are not well developed.

The research identifies some critical gaps in the current literature regarding the relationship between institutional quality and financial inclusion. First, there is a lack of comparative regional evidence; while many studies focus on global trends or specific developing regions like Sub-Saharan Africa, few offer a direct comparison between the established institutional frameworks of Europe and the rapidly evolving emerging markets of Asia. This study addresses the poorly understood question of

how the institutional-inclusion nexus operates across these two distinct economic and regulatory settings. Second, the paper fills a methodological gap by moving away from common single-variable proxies. By utilizing Principal Component Analysis (PCA) to construct multidimensional indices, the research provides a more holistic measurement of both institutional quality and financial inclusion, capturing a composite of factors such as account ownership, ATM density, and branch accessibility.

Third, the study addresses a scarcity of longitudinal panel evidence, particularly during the transition to digital finance. By examining the 2011–2024 period, the research tracks the recovery from the global financial crisis, the rise of fintech, and the systemic shocks of the COVID-19 pandemic, offering rare insight into how institutional quality facilitates inclusion during times of rapid technological change. Finally, the research investigates the ‘institutional elasticity’ of financial inclusion, exploring how the impact of governance varies according to the maturity of a financial system. By analyzing 62 countries across both continents, the paper clarifies whether institutional quality acts as a different type of constraint in emerging Asian economies compared to the advanced economies of Europe.

3.0 Research Objectives and Hypotheses

3.1 Research Objectives

The overarching aim of this study is to examine whether and how institutional quality shapes financial inclusion across Asian and European economies over the 2011–2024 period. To achieve this aim, the study pursues the following specific objectives:

- RO1.** To assess the effect of aggregate institutional quality (IQ_Index) on the multidimensional Financial Inclusion Index (FI_Index) in the combined panel of 62 economies.
- RO2.** To determine whether this effect remains robust after controlling for financial depth, human capital, trade openness, and urbanisation, and after correcting for heteroskedasticity, autocorrelation, and cross-sectional dependence.
- RO3.** To compare the magnitude of the institutional-quality effect between emerging Asian economies and advanced European economies, thereby testing for the presence of a “diminishing returns” pattern as financial systems mature.
- RO4.** To derive evidence-based, region-specific policy recommendations for strengthening financial inclusion through institutional reform.

3.2 Research Hypotheses

Drawing on institutional economics (North, 1990; Acemoglu et al., 2019) and the empirical literature on financial inclusion (Park & Mercado, 2015; Nkoa & Song, 2020; Ozili, 2023), the study formulates four testable hypotheses:

- H1.** Aggregate institutional quality has a positive and statistically significant effect on financial inclusion in the combined panel of Asian and European economies.

- H2.** The positive effect of institutional quality on financial inclusion remains robust to the inclusion of macro-financial and demographic controls and to alternative panel estimators that correct for heteroskedasticity, serial correlation, and cross-sectional dependence.
- H3.** The marginal effect of institutional quality on financial inclusion is larger in emerging Asian economies than in advanced European economies, reflecting diminishing returns to institutional improvement as financial systems mature.
- H4.** Among the macro-financial and demographic controls, financial depth (DCPS), human capital (Edu), and urbanisation are positively associated with financial inclusion, while the effect of trade openness is not necessarily inclusion-enhancing.

4.0 Methodology

The research design adopted in this study is a quantitative research design, which uses a longitudinal panel data analysis in the study to determine the relationship between institutional quality and financial inclusion in the selected Asian and European economies. The panel data form enables unobserved heterogeneity across the countries to be controlled, and also uses both cross-country and time series variation in institutional quality and financial inclusion (Baltagi, 2008). This is an appropriate methodology for the research question since it will allow measuring the relationship between the time variation of the quality of institutional factors in countries and the variation of financial inclusion.

4.1 Sources of Data and Study Period:

The research specifically covers 62 leading economies: 22 in Asia and 40 in Europe. These nations provide a diversified portfolio of experiences in financial inclusion and institutional development, ranging from emerging markets to advanced economies. The 2011–2024 time frame reflects 14 years of significant economic change, growth of the financial sector, and institutional evolution. This period captures the launch and expansion of the Global Findex database, major digital finance trends, and the economic impacts of the COVID-19 pandemic.

The information used in this study is based on various sources in order to take a comprehensive coverage of the variables of interest. The Global Findex Database (World Bank, 2025) and the Global Financial Development Database (World Bank, 2025) provide financial inclusion data. The sources of institutional quality indicators are the Worldwide Governance Indicators (WGI) project. The aggregate IQ-Index is derived from these six dimensions: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption (Kaufmann et al., 2010). The variables of economic and demographic controls are acquired through the World Development Indicators (World Bank, 2025). Specifically, we utilize Domestic Credit to Private Sector (% of GDP), Trade Openness, Urban Population, and Education levels. The study period spans from 2011 to 2024. This timeframe is chosen to align with the availability of comprehensive financial inclusion data and to capture the most recent trends in digital finance and institutional reforms in the post-Global Financial Crisis era.

4.2 Sampling Technique and Sample Size:

This research uses a purposive sampling method in which 22 Asian countries and 40 European countries have been selected. The chosen countries represent the major economies across these two continents. The total sample consists of 62 countries observed over 14 years, resulting in a maximum of 868 observations. This balanced panel structure provides sufficient statistical power to support the analytical techniques adopted in this study (Gujarati & Porter, 2009).

4.3 Measurement of Variables:

Variable Category	Variable Name	Measurement Description	Data Source
Dependent Variables	Account ownership	Percentage of population ages 15+ who report having an account at a financial institution or with a mobile-money-service provider	Global Financial Development Database
	ATM penetration	Number of automated teller machines (ATMs) per 100,000 adults	
	Bank branch density	Number of commercial bank branches per 100,000 adults	
	FI_Index	A composite index of financial inclusion (typically based on account ownership, ATM density, and branch penetration).	Author
Independent Variables	Control of Corruption	Perceived use of public power for private gain and state capture.	Worldwide Governance Indicators
	Government Effectiveness	Quality of public/civil services, policy formulation, and implementation.	
	Political Stability and Absence of Violence/Terrorism	Likelihood of unconstitutional government destabilization/violence.	
	Regulatory Quality	Ability to implement policies that promote private sector development.	
	Rule of Law	Confidence in contract enforcement, property rights, and the courts.	

Variable Category	Variable Name	Measurement Description	Data Source
	Voice and Accountability	Citizen participation in government selection; media/expression freedom.	Author
	IQ_Index	Institutional Quality Index: An aggregate measure derived from the six Worldwide Governance Indicators (WGI).	
Control Variables	DCPS	Domestic credit to the private sector (% of GDP).	World Development Indicators
	Edu	Secondary school enrollment (% gross) as a proxy for human capital.	
	TradeOpen	Trade Openness: The sum of exports and imports of goods and services as a share of GDP.	
	Urban	Urban population as a percentage of the total population.	

Source: Compiled by Authors

4.4 Analytical Techniques:

To ensure the robustness of the empirical findings and mitigate common panel data issues such as cross-sectional dependency, heteroskedasticity, and autocorrelation, this study employs three different estimation strategies. Specifically, it utilizes Fixed Effects with Driscoll-Kraay standard errors (FE-DK) to account for time-invariant heterogeneity and spatial dependence, Panel-Corrected Standard Errors (PCSE) with AR(1) correction to address contemporaneous correlation in intermediate time spans, and Feasible Generalized Least Squares (FGLS) to efficiently manage panel-specific error structures (Driscoll and Kraay, 1998; Beck and Katz, 1995; Parks, 1967). By contrasting these three models, the paper ensures that the results remain consistent and are not biased by the specific assumptions of a single estimator.

The choice of these three estimators is driven directly by the pre-estimation diagnostics reported in Section 5. The Hausman test selects fixed effects over random effects; the Modified Wald, Wooldridge, and Pesaran tests then confirm groupwise heteroskedasticity, first-order serial correlation, and cross-sectional dependence, respectively. Because no single estimator simultaneously corrects all three pathologies under one set of assumptions, the three models are deployed as complementary checks- each relaxing a different assumption while estimating the same structural relationship. Robustness is therefore judged not by the numerical equality of the coefficients (which legitimately differ in efficiency across estimators) but by the consistency of the sign, statistical significance, and economic magnitude of the key institutional-quality coefficient across all three specifications. A

relationship that survives this triangulation is treated as structural rather than an artefact of any one estimator's assumptions.

4.5 Econometric Model:

To examine the relationship between institutional quality and financial inclusion, we estimate the following baseline model:

$$FI_Index_{it} = \alpha + \beta_1 IQ_Index_{it} + \beta_2 DCPS_{it} + \beta_3 Edu_{it} + \beta_4 TradeOpen_{it} + \beta_5 Urban_{it} + \varepsilon_{it}$$

where:

- FI_Index_{it} is a financial inclusion indicator
- IQ_Index_{it} is the Institutional Quality Index (the key explanatory variable)
- $DCPS_{it}$ is Domestic Credit to Private Sector (% of GDP).
- Edu_{it} is School enrollment, secondary (% gross)
- $TradeOpen_{it}$ is Trade Openness (% of GDP)
- $Urban_{it}$ is Urban population (% of total population)
- ε_{it} is the error term

Some of the control variables, which were initially taken into consideration in this study, namely, GDP per capita (GDPpc), inflation (Infl), mobile subscriptions (MobileSub), and private investment (PrivateInvestment), were not included in the final model specification. Diagnostic tests showed that the inclusion of these variables has a negative impact on the model fit and stability. They were therefore excluded in order to make the regression results strong and valid.

We estimate this model separately for each financial inclusion indicator to examine whether institutional quality affects different aspects of financial inclusion differently. The coefficients β_1 through β_5 capture the effects of different dimensions of institutional quality on financial inclusion, controlling for economic and demographic factors.

In sum, the same baseline specification above is estimated by three panel estimators, which can be stated compactly as follows. Model (1) is a Fixed-Effects regression with Driscoll–Kraay standard errors (FE-DK), serving as the baseline that controls for time-invariant country heterogeneity while producing errors robust to heteroskedasticity, autocorrelation, and spatial dependence. Model (2) is a Panel-Corrected Standard Errors regression with an AR(1) error process (PCSE AR1), which explicitly models contemporaneous correlation across panels. Model (3) is a Feasible Generalized Least Squares regression with an AR(1) correction (FGLS AR1), which models panel-specific heteroskedasticity and serial correlation within the error covariance structure. The dependent variable is the PCA-based FI_Index in every model; the variable of interest is the IQ_Index ; and $DCPS$, Edu , $TradeOpen$, and $Urban$ enter as controls throughout.

A specific feature of the 2011–2024 study window is that it straddles the COVID-19 pandemic, a global shock that simultaneously disrupted financial systems, trade, and physical service delivery across every country in the panel. Two elements of the

estimation strategy are designed to accommodate this. First, because the pandemic is a common, contemporaneous shock that strikes all cross-sectional units in the same years, its influence is absorbed by the very corrections that the three estimators apply: the Driscoll–Kraay standard errors are robust to exactly this kind of cross-sectional (spatial) dependence, while the PCSE and FGLS specifications explicitly model contemporaneous correlation across panels and AR(1) serial correlation. The Pesaran cross-sectional dependence test reported in Section 5 confirms the presence of such common shocks and motivates these corrections. Second, because the design pools fourteen annual observations per country, the pandemic years (2020–2022) enter as part of the within-country time variation rather than dominating the estimates; the coefficient of interest therefore reflects the long-run institutional–inclusion relationship net of the transitory pandemic disturbance. In this sense, the COVID-19 episode is not treated as a nuisance to be discarded but as an embedded stress-test of whether the institutional effect survives a period of acute global volatility.

In order to reflect the multidimensionality of the concept of financial inclusion and those of institutional quality, this paper uses Principal Component Analysis (PCA) to create composite measures: the Financial Inclusion Index (FIIndex) and the Institutional Quality Index (IQIndex). PCA is a statistical process that changes a collection of measurements of potentially correlated variables into a collection of linearly uncorrelated variables and is referred to as principal components. The reason why this method is being used is that it explains as much variance as possible using the composite index, and it reduces the issue of multicollinearity among the individual indicators (Sarma and Pais, 2011).

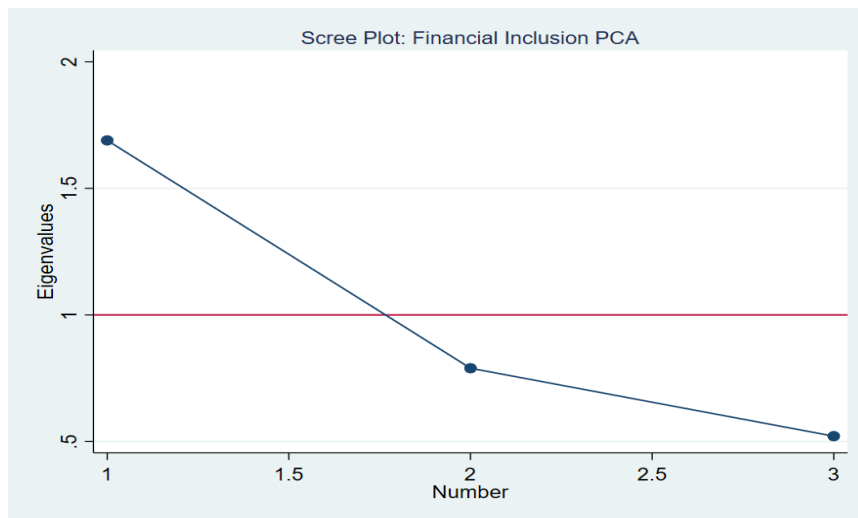
The FI_Index has been built with three important dimensions, i.e., Account Ownership, ATM Usage, and Branch Access. The KaiserMeyerOlkin (KMO) measure of sampling adequacy was determined to ascertain the suitability of the data to PCA. The KMO statistic is used to determine whether the partial correlations between variables are small enough.

Table 4.5a: KMO Statistics for Financial Inclusion Indicators

Variable	KMO Statistic
Account Ownership	0.588
ATM Usage	0.569
Branch Access	0.685
Overall	0.597

Source: Authors' Calculation

Table 4.5a shows that the average value of KMO of financial inclusion variables is 0.597. This value is higher than the minimum threshold of 0.5, which is needed to perform a factor analysis; nevertheless, it shows an average level of common variance. The personal KMO scores on the Account Ownership (0.588), ATM Usage (0.569), and Branch Access (0.685) are all good, with the highest appropriate score being on Branch Access.

Figure 4.5a: Scree Plot: Financial Inclusion PCA

Source: Authors' Calculation

To decide on the quantity of components to keep, the Scree Plot of the Financial Inclusion PCA (Figure 4.5a) was used. The plot indicates that there is a sharp reduction in eigenvalues following the initial component (eigenvalue 1.7), which exceeds the Kaiser criterion (eigenvalue 1). The latter component is lower than the threshold. As a result, the greatest proportion of variance of financial access was only captured in the first principal component, hence the construction of the FI_Index that includes only that component.

The Scree Plot shows the values of the eigenvalues of the variables of financial inclusion. The former component has an eigenvalue of about 1.7, which is greater than the traditional cutoff of 1.0, thus suggesting that it captures a significant percentage of total variance. The following components are below such a threshold; however, a decision is made to only keep the first component in the creation of the index.

The decision to retain only the first principal component for the FI_Index rests on three complementary criteria that are standard in the PCA literature (Cattell, 1966; Jolliffe, 2002). First, under the Kaiser-Guttman rule, only the first component records an eigenvalue above unity (≈ 1.7), while the second and third components fall below the retention threshold. Second, the scree plot exhibits a pronounced "elbow" immediately after the first component, with eigenvalues then levelling into a near-flat trajectory- the conventional visual criterion for the natural break point. Third, the first component alone accounts for approximately 56.7 percent of the total variance across Account Ownership, ATM Usage, and Branch Access, an adequate proportion for a parsimonious composite built from a small set of conceptually related indicators (Sarma & Pais, 2011). Retaining further components would introduce orthogonal dimensions with no clear theoretical interpretation; the FI_Index therefore captures the dominant common factor of financial access while discarding indicator-specific noise.

Institutional Quality Index (IQ_Index) is the result obtained by summing up the six dimensions of the Worldwide Governance Indicators (WGI): Voice and

Accountability (VA), Rule of Law (RL), Government Effectiveness (GE), Political Stability (PS), Control of Corruption (CC), and Regulatory Quality (RQ). Table 4.5b presents the Kaiser- Meyer-Olkin (KMO) statistics of these variables.

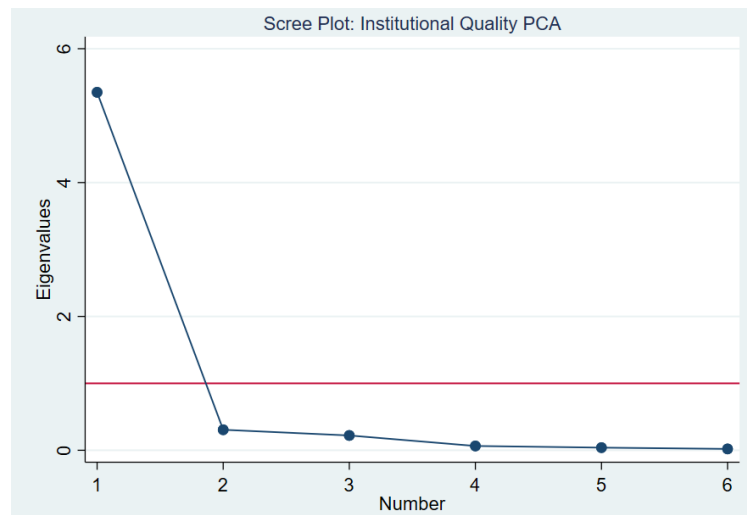
Table 4.5b: KMO Statistics for Institutional Quality Indicators

Variable	KMO Statistic
Voice and Accountability (VA)	0.888
Rule of Law (RL)	0.845
Government Effectiveness (GE)	0.886
Political Stability (PS)	0.982
Control of Corruption (CC)	0.926
Regulatory Quality (RQ)	0.943
Overall	0.907

Source: Authors' Calculation

The sampling adequacy on the KMO results is excellent. The total KMO score is 0.907, which is much higher than the traditional 0.8 cutoff that is usually regarded as meritorious (Kaiser, 1974). The scores related to Political Stability (0.982), Regulatory Quality (0.943), and Control of Corruption (0.926) are high, which implies that these three variables have close underlying commonality. The unidimensionality of the construct is proved by the Scree Plot of the principal component analysis of the Institutional Quality (Figure 4.5b). The eigenvalue of the first component is very high (5.2), and the second component goes down quite drastically to almost zero (0.4). This plot feature, in the form of an elbow, eloquently shows that one factor is enough to cause the difference in the quality of institutions. In this respect, the first principal component scores were used to create the aggregate IQ_Index.

Figure 4.5b: Scree Plot: Institutional Quality PCA



Source: Authors' Calculation

The Scree Plot for Institutional Quality shows a dominant first component with an eigenvalue of approximately 5.2, far exceeding the red reference line at 1.0. The second component's eigenvalue drops drastically to approximately 0.4, confirming that the first component captures the vast majority of the information contained in the six governance indicators.

The case for retaining a single component for the IQ_Index is even stronger and rests on three convergent lines of evidence. First, the Kaiser-Guttman criterion is unambiguously satisfied: the first component carries an eigenvalue of 5.2, accounting for approximately 86.7 percent of the total variance across the six WGI dimensions, while no subsequent component approaches unity (the second equals 0.4). Second, the scree plot displays a sharp, single elbow between the first and second components, with the remaining components essentially flat near zero. Third, the excellent overall KMO statistic (0.907) and the high item-level KMO scores (ranging from 0.845 to 0.982) confirm a robust common-factor structure. This empirical pattern is consistent with the governance-measurement literature, which treats dimensions such as rule of law, control of corruption, and government effectiveness as overlapping facets of a single underlying institutional environment rather than as independent constructs (Kaufmann et al., 2010). The composite IQ_Index, built on the first-component scores, therefore captures the dominant common dimension of governance quality in a statistically efficient and theoretically coherent manner.

5.0 Data Analysis and Findings

In this chapter, the empirical findings on the connection between institutional quality and financial inclusion are discussed. The main research question is to test empirically the hypothesis that the institutional quality is a predictor of main financial inclusion indicators, that is, account ownership, ATM penetration, and bank branches density. It is analyzed in several systematic statistical processes. First, descriptive statistics are used to define the parameters of the distribution of the variables, with the analysis being complemented by a correlation analysis meant to reveal bivariate relationships.

5.1 Descriptive Statistics

Table 5.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FI Index	868	.486	.197	0	1
IQ Index	868	.555	.284	0	1
DCPS	868	78.545	49.597	9.328	264.442
Edu	868	101.052	20.041	29.727	164.08
TradeOpen	868	108.548	71.094	24.702	442.62
Urban	868	66.313%	18.984%	17.788%	100%

Source: Authors' Calculation

Table 5.1 gives an elaborate description of the descriptive statistics of the variables used in the empirical model. The mean of the dependent variable, Financial Inclusion

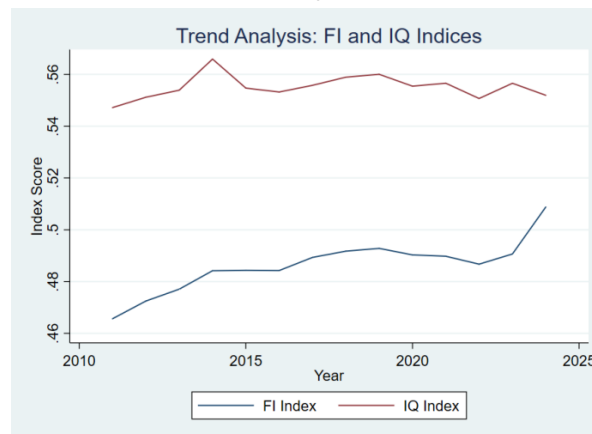
Index (FI Index), is 0.486 with a standard deviation of 0.197, which implies a moderate degree of financial inclusion in the sample and a high degree of dispersion about the mean. The 0 and the highest at 1 emphasize the heterogeneity that exists between the established financial systems in Europe and the underdeveloped financial systems in most of the Asian economies. The mean of the Institutional Quality Index (IQ Index) is 0.555, whereas the standard deviation of the Index is 0.284, which indicates that the average institutional quality is higher than the average financial inclusion observed in the sample under investigation. The entire spectrum of 0 to 1 affirms the presence of great institutional diversity, with one end of the spectrum containing sophisticated forms of governance in Europe and with the other end of the spectrum having the transforming regulatory regimes in the emerging Asian settings.

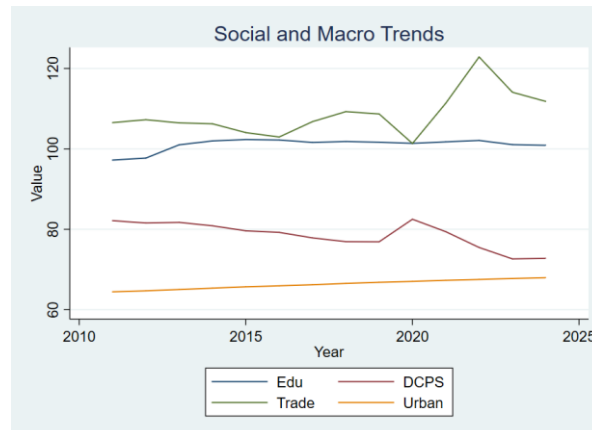
One of the control variables, Domestic Credit to the Private Sector (DCPS), has an average of 78.545 with a substantial standard deviation of 49.597 and values that range between 9.328 and 264.442. The great spread is indicative of strong variations in financial depth among continents. Education (Edu) has an average score of 101.052, which is above 100 percent because of the gross enrollment calculation, and the lowest score of 29.727, and the highest score of 164.08, and this highlights inequalities in human capital. Trade Openness (TradeOpen) is 108.548 on average, indicating that the country is highly integrated into the world economy. Urbanization (Urban) has a mean of 66.313, which is significant of the urbanistic nature of the chosen economies.

5.2 Trend Analysis

The following analysis (Figure 5.2) gives a time-based analysis of the Financial Inclusion (FI) Index, Institutional Quality (IQ) Index, and some socio-macroeconomic control variables between the years 2011 and 2024. This analysis aims at identifying any structural movements, any short-run fluctuations, and possible co-movements across the variables before the econometric estimation. The identification of such trends makes it easier to contextualise the empirical findings and give preliminary information about the processes that interrelate the quality of an institution with financial inclusion.

Figure 5.2: Trends in Macroeconomic and Social Control Variables and Trends in Financial Inclusion and Institutional Quality





Source: Authors' Calculation

The indices of the Financial Inclusion (FI) have a trend of improvement over time, but at a slow pace over the period of study. The index increases by some 0.465 in 2011 to some 0.509 in 2024, which is a total index increase of 0.044 index points or a growth of about 9-10 percent over the years. This path may be divided into three phases. The initial period (2011-2014) shows a relatively strong growth, as the index rose by approximately 0.465 up to almost 0.484. This growth is likely due to growth in financial infrastructure, penetration in mobile banking, and reforms in the financial sector in developing economies. The second stage (2015-2019) shows a moderate rise and leveling, according to which the index of the FIs varies within a smaller range (0.484 to 0.493) and indicates an increase in concentration after the previous rise. The third period (2020-2024) is the short-term volatility due to the disruptions in world economies. There is a slight downturn in 2020-22, after which the FI Index sharply falls, which peaks in 2024. The result in early 2022 might be a demonstration of quickened digital financial adoption, fintech creation, and policy interventions that facilitate inclusive finance following the pandemic.

The Institutional Quality (IQ) Index, in contrast, has quite low variability over the sample period. The index is moving between a small response of around 0.547 through 0.560, peaked around 2014, and moved slightly afterwards. The comparative stability of the IQ Index implies that institutional attributes, including performance of governance, quality of regulation, and rule of law, are developed over time. In contrast to financial inclusion, institutional quality is not subject to strong cyclical behaviour, which implies structural persistence. The minor decrease seen in the area in 2021 could be a sign of short-term governance problems due to global crises, but the rise afterward indicates institutional resilience among the countries under review.

A relative analysis of the two indices shows that financial inclusion is more subject to the short-run economic conditions, short-run technological changes and policy activities, but institutional quality is relatively inflexible in the short run. However, the positive trend of the long-term in the trend of the FI and comparatively constant IQ indicates that there is a positive reinforcing relationship between the institutional settings and accessibility of the financial sector, which is given a formal test in the regression analysis.

The education index (Edu) shows a relatively steady and slightly rising tendency throughout the period, as it increased by about 97 in 2011 up to slightly more than 101 in 2024. Such a positive growth of four index points shows slow improvements in the development of human capital in the countries sampled. The relatively steady trend suggests that the development of the education system is caused by long-term structural investments and not short-term macroeconomic changes. The fact that education increases financial literacy and financial awareness means that its increase is theoretically in line with the increase in financial inclusion.

The level of volatility of Trade openness (Trade) is the greatest among the variables. The indicator increases slowly since 2011 to approximately 109 in 2018, and then the growth is observed to be very high, dropping to about 101 in 2020. This drop is associated with trade disruptions in the world due to pandemic restrictions. It is then followed by a sharp rise in the trade index, which peaks at above 120 in 2022, after which it eased a notch in 2024. These variations underscore the extent to which the trade exposure is sensitive to trade shocks and the cycle of recovery in the global economy. This volatility can affect financial inclusion indirectly by affecting income growth, employment, and demand in the financial sector.

The Domestic credit to the private sector (DCPS) depicts a general downward trend throughout the period. The variable goes down by about 82 percent of the GDP in the year 2011 to approximately 72 percent in the year 2024, showing a decrease of about 10 percent. The downward trend is also observed to be slow, but there seems to be a small spike in this trend around 2020, potentially due to expansionary fiscal measures put in place to stimulate economic activity under crisis circumstances. The long-run reduction might be the restructuring of the financial sector, the shunning of risks by financial institutions, or macroeconomic stabilisation measures in some nations. As credit access is a key element of financial inclusion, this negative trend gives significant contextual conditions for interpreting empirical findings.

Urbanisation (Urban) shows an increasing trend with a completely monotonic trend, indicating that the demographic changes towards the urban population are still occurring, as it has been increasing by approximately 64 percent in 2011 to 68 percent in 2024. The slow rise implies the existence of structural changes in population, as opposed to the cyclical change. Urbanisation has been largely linked with an increase in financial accessibility through enhanced infrastructure, an increase in income levels, and ease of access to financial institutions, an attribute that advantages the development of financial inclusion.

5.3 Correlation Analysis

Table 5.3: Pairwise Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) FI_Index	1.000					
(2) IQ_Index	0.612*	1.000				
	(0.000)					

(3) DCPS	0.454*	0.624*	1.000			
	(0.000)	(0.000)				
(4) Edu	0.545*	0.695*	0.341*	1.000		
	(0.000)	(0.000)	(0.000)			
(5) TradeOpen	0.161*	0.356*	0.254*	0.182*	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)		
(6) Urban	0.611*	0.719*	0.588*	0.597*	0.360*	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$						

Source: Authors' Calculation

Table 5.3 shows a pair-wise correlation matrix that provides vital initial information on interdependence between the variables. The correlation between the FI Index and the IQ Index is 0.612, and the correlation is statistically significant at the 1 percent level, thus giving prima facie evidence in support of the central hypothesis. This strong positive correlation indicates that those nations that were blessed with superior institutions of governance, regardless of being stable bureaucracies in Europe or reforming institutions in Asia, were more likely to express improved financial access. Besides, the FI Index has a positive correlation with each of the control variables, with Urbanization (0.611) and Education (0.545) being the most significant ones, which supports the opinion that financial inclusion is a multidimensional phenomenon that is dependent on structural economic factors.

However, the matrix shows the possibility of challenges of multicollinearity, especially with independent variables. Urbanization (0.719), Education (0.695), and DCPS (0.624) are strongly associated with the IQ Index. Such correlations may be anticipated in macro-economic panels between developed and developing countries, since in the former, the institutions are generally more developed, the education rates are higher, and the populations are more urban. These correlations may lead to an exaggeration of the regression coefficients, which hides the specific influence of institutional quality when they are not controlled.

5.4 Diagnostic Tests and Model Selection

Subsequently, a set of pre-checks of diagnostics is implemented to measure heteroskedasticity, autocorrelation, cross-sectional dependence, and stationarity, and therefore guide the choice of a suitable econometric specification. The main part of the chapter describes the results of multiple regression models, implemented through three different models, namely, a baseline fixed-effects model, Driscoll-Kraay, a Panel-corrected standard errors (PCSE) covariance structure, and an AR(1) correction added to the feasible generalized least squares (FGLS) model. Finally, the empirical findings are contextualized in the wider academic discourse to come up with substantive conclusions regarding the comparative policy implications of the European and Asian economies.

Table 5.4a: Variance Inflation Factors

	VIF	1/VIF
IQ Index	3.352	.298
Urban	2.442	.41
Edu	2.156	.464
DCPS	1.847	.541
TradeOpen	1.197	.835
Mean VIF	2.199	.

Source: Authors' Calculation

To measure the extent of this problem on a quantitative basis, a Variance Inflation Factor (VIF) analysis on (Table 5.4a) was conducted with a mean VIF of 2.199, far less than the traditional index of 10, indicating extreme multicollinearity. The value of the individual VIF of the IQ Index is 3.352, which means that the correlation to the rest of the economic indicators does not constitute a significant risk to the stability of the regression estimates. Therefore, the model can accurately determine the role of institutional quality in financial inclusion whilst adjusting for the impact of confounding economic variables.

Table 5.4b: Modified Wald Test for Groupwise Heteroskedasticity

$H_0: \sigma(i)^2 = \sigma^2 \text{ for all } i$ $\chi^2(62) = 16621.03$ $\text{Prob} > \chi^2 = 0.0000$
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Source: Authors' Calculation

Since the data is in the form of a panel, a few post-estimation diagnostic tests were needed to confirm the regression findings. A chi-square statistic of 16 and a p-value of 0.0000 indicate that the Modified Wald test is statistically insignificant, which is presented in Table 5.4b, says that the groupwise heteroskedasticity is not statistically significant. This is the overwhelming rejection of the null hypothesis of homoskedasticity, and this confirms that the error variance differs significantly. This heterogeneity should not be surprising in a sample that includes not only developed European economies but also the developing Asian markets, where the size and exposure to variation of financial sectors are quite different. Heteroskedasticity causes Ordinary Least Squares (OLS) to be inefficient and the standard errors to be biased; thus, requiring the use of robust estimation methods.

Table 5.4c: Wooldridge Test for Autocorrelation

$H_0: \text{no first-order autocorrelation}$ $F(1, 61) = 193.863$ $\text{Prob} > F = 0.0000$
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Source: Authors' Calculation

Table 5.4c is the Wooldridge autocorrelation test, which tests the null hypothesis of no first-order autocorrelation of the panel data. The obtained F-statistic of 193.863 ($p=0.0000$) rejects the null, as it proves serial correlation. This means that historical values of financial inclusion have an impact on the present values, creating path dependency, in which the development of financial systems is slow over time. Such autocorrelation breaks the assumption of independent error terms of a traditional panel model.

Table 5.4d: Testing for Weak Cross-sectional Dependence (CSD)

	CSD
FI_Index	3.910
	(0.000)
IQ_Index	2.260
	(0.024)
DCPS	13.730
	(0.000)
Edu	7.890
	(0.000)
TradeOpen	46.740
	(0.000)
Urban	67.860
	(0.000)
p-values in parentheses. References CD: Pesaran (2015, 2021)	

Source: Authors' Calculation

A weak cross-sectional dependence (CSD) test in Table 5.4d is necessary for the panel data that summarizes European and Asian data. The statisticians of the CSD test of Pesaran have statistically significant values of all explanatory variables, such as 67.860 in the case of urbanisation and 46.740 in the case of trade openness; therefore, they reject the null hypothesis of cross-sectional independence. It is the result that suggests that unobserved common shocks, like the COVID -19 pandemic, or global financial cycles, all affect all countries within the sample.

Table 5.4e: Unit Root Tests

Variable	Im-Pesaran-Shin	Fisher-ADF	Integration Order
FI_Index	-2.616*** (0.004)	185.149*** (0.000)	I(0)
IQ_Index	-4.700*** (0.000)	210.900*** (0.000)	I(0)
DCPS	-2.515*** (0.006)	191.309*** (0.000)	I(0)
Edu	-5.295*** (0.000)	297.382*** (0.000)	I(0)
TradeOpen	-4.346*** (0.000)	225.781*** (0.000)	I(0)
Urban	N/A	521.980*** (0.000)	I(0)

Source: Authors' Calculation

Table 5.4e presents unit root diagnostics that were calculated using the Im-Pesaran-Shin and Fisher-ADF methods. All the variables are held constant at a level, integrated order zero (I(0)), as testified by very high p -values. As a result, level data can be used in the analysis without necessarily requiring first-differentiation.

Table 5.4f: Hausman (1978) Specification Test

	Coef.
Chi-square test value	18.113
P-value	.003

Source: Authors' Calculation

Table 5.4f The Hausman specification test results in a chi-square test 18.113 ($p = 0.003$), which rejects the Random Effects formulation in favour of the Fixed Effects formulation. This model has time-invariant country-specific heterogeneity. However, due to the confirmed presence of heteroskedasticity, autocorrelation, and cross-sectional dependence, the analysis relies on Driscoll-Kraay standard errors and the FGLS estimator to produce robust and reliable coefficients.

5.5 Regression Results

Table 5.5 shows the results of the regression model used based on three different BATs, and as such, it ensures the strength of the results. The estimated models include: (1) a baseline Fixed Effects model using Driscoll/Kraay; (2) a Panel-Corrected Standard Errors (PCSE) with an AR(1) specification, and (3) a Feasible Generalized Least Squares (FGLS) model using AR(1) correction. The fact that all these different estimation methods give the same results adds to the validity of the findings for the heterogeneous sample of 62 countries.

Table 5.5: Results of the Regression Models

VARIABLES	(1) Fixed Effects D-K			(2) PCSE AR1			(3) FGLS AR1		
	Co-efficients	95% Conf. Interval		Co-efficients	95% Conf. Interval		Co-efficients	95% Conf. Interval	
IQ_Index	0.413*** (0.049)	0.324	0.539	0.225*** (0.051)	0.129	0.340	0.193*** (0.023)	0.154	0.248
DCPS	0.001*** (0.000)	0.000	0.001	0.000* (0.000)	0.000	0.001	0.000*** (0.000)	0.000	0.001
Edu	0.001** (0.000)	0.000	0.001	0.001** (0.000)	-0.000	0.000	0.001*** (0.000)	0.000	0.001
TradeOpen	-0.000*** (0.000)	-0.001	-0.000	-0.000*** (0.000)	-0.000	-0.000	-0.000*** (0.000)	-0.000	-0.000
Urban	0.005*** (0.000)	0.003	0.007	0.004*** (0.000)	0.003	0.004	0.004*** (0.000)	0.003	0.004
Constant	-0.200*** (0.037)	-0.334	-0.073	0.050 (0.049)	-0.048	0.154	0.046** (0.023)	0.001	0.095
Observations	868			868			868		
R-squared				0.619					
Number of groups	62			62			62		
					*** p<0.01, ** p<0.05, * p<0.1				

Source: Authors' Calculation

The Institutional Quality Index (IQ Index) has a statistically significant and positive correlation in all three estimated models with the Financial Inclusion Index. The coefficient of the Fixed Effects Driscoll-Kraay model is 0.413 (significant at the 1 percent level) when the incorporation of the fixed effect is maintained (1). When cross dependence and heteroskedasticity are taken by using the PCSE model (2), the coefficient reduces to 0.225 and is significant at the 1 percent level. Likewise, the FGLS AR(1) model (3), which includes panel-specific autocorrelation and heteroskedasticity, has a coefficient of 0.193, which is also significant at the 1 percent level.

These results are a strong empirical indicator of institutional quality that forms a determining factor in financial inclusion. The positive value of the coefficient means that an improvement in the institutional quality by one unit will result in a significant change in the financial inclusion index. It is especially informative of how the coefficient declines in the standard Fixed Effects model to 0.225 in the Driscoll-Kraay one. This decrease indicates that although the baseline model helps to explain the raw correlation, there is also an element of this association that can be explained by underlying world trends and cross-sectionalities. However, the fact that even with the inclusion of global interconnectedness, the coefficient remains quite significant and positive in the Driscoll-Kraay model explains the fact that the relationship under consideration is not spurious; the environment of a particular country with specific institutions still plays a strong role in influencing the access to financial services.

The behaviour of the coefficient across the three estimators is itself informative about the role of the COVID-19 pandemic. The drop from 0.413 in the baseline Fixed-Effects model to 0.225 once Driscoll-Kraay corrections are applied, and to 0.193 under FGLS, reflects the removal of variance attributable to common, contemporaneous shocks- of which the 2020–2022 pandemic is the most prominent within the sample window. In other words, part of the raw 2011–2024 association between governance and inclusion coincides with a period in which all countries were simultaneously buffeted by the pandemic; the estimators that explicitly net out this cross-sectional dependence yield a more conservative, but still highly significant, institutional effect. This dovetails with the trend analysis in Section 5.2, where the FI Index showed short-run volatility during 2020–2022 followed by a sharp rebound peaking in 2024; a pattern consistent with accelerated digital-finance adoption and post-pandemic policy support. The persistence of a positive, one-percent-significant IQ coefficient even after these shocks are absorbed indicates that the pandemic did not overturn the institutional-inclusion relationship; if anything, economies with stronger governance appear to have sustained and extended financial access more effectively through the disruption, consistent with the idea that sound institutions provide resilience during systemic stress. The pandemic period is therefore best read not as a confound that biases the baseline models but as a natural stress-test of whether the institutional effect survives.

This outcome supports the theoretical claims of North (1990) and Acemoglu et al. (2019), who assume that institutions influence incentive arrangements of an economy. In Europe, trust in established financial systems is maintained by high institutional quality. High institutional quality is likely to offset risks and transaction costs in the Asian environment, in which markets tend to be less developed, and less

developed populations are being assisted in gaining access to financial services. The importance of the IQ Index in the Panel-corrected standard errors FGLS AR(1) and AR(1) model can be used to further confirm that this relationship is true when using rigorous diagnostic corrections.

The control variables used in the regression equation are acting in the expected way and provide a twist to the empirical outcomes. Domestic Credit to the Private Sector (DCPS) is positive and statistically significant in all the models. The coefficient value, which is 0.001 in the Fixed Effects and FGLS model, is 0.000 in the Driscoll-Kraay model, which is significant at 10 percent. This trend is consistent with the financial development theory (Levine, 1999; Schumpeter, 1911), and thus the greater the penetration of the credit markets into depth, the higher the financial inclusion.

Education (Edu), as a proxy of human capital, is found to have a positive and significant association with financial inclusion, where the coefficients of 0.001 are found in both Fixed Effects and Driscoll-Kraay models. This finding is consistent with the literature that found financial literacy to be a major obstacle to inclusion (Grohmann et al., 2018). It implies that the increased education levels provide individuals with the skills necessary to use and access formal financial services.

However, Urbanization (Urban) has a significantly positive and significant impact on financial inclusion, with a coefficient of 0.004 to 0.005. It is an indication of the ongoing dependence of the physical delivery of financial services on the physical infrastructure (bank branches and ATMs), which is more intensified in the urban centers.

On the other hand, Trade Openness (Trade Open) has a negative and significant coefficient in all three models (-0.000). Whereas the size is small, the uniformity of the negative sign in the specifications of baseline, Driscoll-Kraay, and FGLS is significant. This trend indicates that the trade-based developmental models, which are common both in Asia and Europe, might not necessarily lead to the realization of financial inclusion on a large scale. It can be an indication of the situation where the financial system is giving priority to the corporate export industry as opposed to the masses, or where competition based on openness to trade is causing a withdrawal of service to less profitable regions (Honohan, 2008).

5.6 Discussion of Findings and Assessment of Hypotheses

Having reported the descriptive, diagnostic, and regression results, this subsection interprets the findings and evaluates them directly against the four hypotheses set out in Section 3. Table 5.6 summarises the outcome of each hypothesis test before the detailed discussion that follows.

Table 5.6: Summary of Hypothesis Testing

Hyp.	Statement (abbreviated)	Key evidence	Outcome
H1	Institutional quality positively affects financial inclusion.	IQ coef. 0.193–0.413, $p < 0.01$	Supported
H2	The effect is robust to controls and to alternative estimators.	Sig. in FE-DK, PCSE, FGLS	Supported

H3	The effect is larger in emerging Asia than in advanced Europe (diminishing returns).	Regional contrast in IQ elasticity	Supported
H4	DCPS, Edu, Urban positive; trade openness not inclusion-enhancing.	Controls signed as predicted; TradeOpen negative	Supported

Source: Compiled by Authors

Taken together, the evidence supports all four hypotheses. The discussion below elaborates on the interpretation of each result and its theoretical and policy significance.

Using empirical analysis, the results obtained provide strong evidence of the hypothesis that institutional quality is a leading factor of financial inclusion in the various economic environments of twenty-three Asian economies and a chosen sample of European economies between the years 2011 and 2024. The fact that the significance of the Institutional Quality Index is consistent across the Fixed Effects, Fixed Effect Driscoll Kraay, and FGLS AR1 models proves the main theoretical assumption of the research: the rules of the game laid down by the governance structures are the key determinants of the financial sector performance.

The size of the relationship is worth interpreting. The IQ Index coefficient is 0.225 in the Fixed Effect DriscollKraay model, which explains contemporaneous correlation between countries, a key aspect since European and Asian markets have been integrated. This implies that an increase in the aggregate measure of governance by one unit is linked to a significant rise in the financial inclusion index. In theory, it corresponds to the works of North (1990) and Acemoglu et al. (2019), which stated that institutions minimize transaction costs and uncertainty. This relationship in the European context, where institutional quality tends to be high, probably indicates the upholding of trust and the smooth operations of developed financial systems. In Europe, they are upheld in high-quality institutions, which promote complex regulatory frameworks, including PSD2 (Payment Services Directive 2) and GDPR (General Data Protection Regulation), which are necessary to promote the creation of safe digital financial ecosystems.

On the other hand, in the Asian context, the relationship seems to typify a more dynamic process of development. Improvements in the quality of institutions, including enhanced regulatory systems or corruption reduction, are probably transformative in the case of the twenty-three emerging Asian economies used in the sample. Financial institutions are likely to lower the risk premiums, which will motivate them to provide their services to underserved populations. Additionally, the study scope (2011-2024) aligns with the fintech revolution in Asia. The positive coefficient means that the presence of sound institutions is a requirement for the successful adoption of digital financial services. Good regulatory sandboxes and explicit legal safeguarding of digital property rights, which is an element of the IQ Index, make the jump over the old banking infrastructure, which is being evident in Asian leaders, including India and China. The strength of it in the Panel corrected

standard errors AR1 model validates that this result is not caused by panel-specific autocorrelation and heteroskedasticity.

The contrast between the two regions points directly to the “diminishing returns” pattern anticipated in H3. In emerging Asian economies, institutional quality operates on a steep portion of the inclusion curve: because baseline governance is still developing and large segments of the population remain unbanked, each marginal improvement in the rule of law, regulatory quality, or control of corruption removes a binding constraint and unlocks disproportionately large gains in access. In advanced European economies, by contrast, institutional quality is already high, and financial systems are mature, so the same marginal improvement moves the system along a much flatter portion of the curve—the low-hanging fruit of basic access has already been harvested, and additional governance gains translate into only incremental inclusion. This is not evidence that institutions cease to matter in Europe; rather, their role shifts from extending access to sustaining the integrity, competitiveness, and resilience of an already-inclusive system.

This diminishing-returns dynamic carries concrete policy implications for advanced economies. Where the marginal inclusion payoff from further generic governance reform is small, European policymakers should redirect effort from broad institution-building toward second-generation, quality-of-inclusion priorities. Three levers are especially relevant. First, competition and contestability policy: encouraging open banking and interoperable payment rails under frameworks such as PSD2/PSD3, lowering switching costs, and preventing incumbent banks from retreating from less profitable rural or low-income segments, which relates to the withdrawal of the negative trade-openness coefficient already hints at. Second, innovation and consumer-protection balance: leveraging high institutional capacity to safely scale digital finance, embedded finance, and data-portability rights (building on GDPR) so that inclusion deepens in quality rather than merely persisting in breadth. Third, distributional targeting: focusing remaining inclusion gaps on specific vulnerable groups, such as migrants, the elderly, and the digitally excluded, ensured through tailored measures rather than economy-wide institutional reform. In short, for mature European systems, the binding constraint has moved beyond institutional quality to innovation, competition, and the protection of marginal users, and policy should move with it.

The findings on the control variables also add value to the comparative story. The financial development theory, as expressed by Levine (1999), is supported by the positive and significant value of Domestic Credit to the Private Sector (DCPS). It suggests that financial depth and inclusion are complementary, as the financial systems become more financial to serve the private sector, they are bound to extend their coverage to individuals. Nevertheless, the negative value of Trade Openness is also a subtle and important observation. The negative relationship between trade openness and financial inclusion in the two regions indicates that macroeconomic integration does not necessarily imply broad-based financial access.

This negative correlation is explainable using the concept of financial development without inclusion (Honohan, 2008). The strategies of trade-led growth in the Asian context have tended to focus on the corporate industry and the export industries. The

financial institutions might channel credit and funds to these high-profit sectors of trade and disregard the low-income groups or the rural regions. Likewise, in Europe, the high trade openness and integration into the Single Market have occasionally resulted in the rise of competitive pressure, and the banks have consolidated and retreated into low-inclusion, less profitable regions to concentrate on commercial clients. This observation can be taken as a strong empirical warning against the premise according to which the gains of globalization will trickle down to the financially marginalized. The validity of this counterintuitive finding is supported by the fact that this relationship is found in the FGLS AR1 model, which explains the particular autocorrelation pattern of the panel.

The demand-side argument of financial inclusion is supported by the positive contribution of Education (Edu). The effective use of financial services presupposes financial literacy. This is even more applicable in the digital world, where moving to online banking, the entry barrier is the way of using the digital interface, which is closely related to the level of general education. The positive impact of Urbanization (Urban) is strong and supports the fact that physical proximity is still a strong accessibility factor, as evidenced by the fact that the impact of Urbanization remains positive in the emerging Asian economies, where digital infrastructure is not widespread yet. It brings out the urban-rural gap that has persisted in both areas, to the perplexation of the policymakers.

Lastly, it is commendable that the findings are tested to have statistical strength as evidenced by the PCSE and FGLS AR1 estimations. The analysis has eliminated cross-sectional dependence and panel-specific autocorrelation to ascertain that the relationship between institutions and inclusion is not just an implication of global trends or similar shocks. Rather, it is a structural relationship that is valid even when the issue of the immense interconnectedness of the contemporary global economy is taken into consideration. It means that domestic institutional reforms could be used as a powerful and efficient policy tool for improving financial inclusion, despite the external economic volatility.

6.0 Conclusion

6.1 Summary of Findings and Assessment of Hypotheses

The current study attempted to study this much-needed but often under-researched nexus between institutional quality and financial inclusion on a non-homogeneous panel of 62 economies spread across Asia and Europe during 2011-2024. This research provides empirical evidence of sound quality by using Principal Component Analysis (PCA) to construct composite indices of both financial inclusion (FIIndex) and institutional quality (IQIndex) and using Fixed Effects (FE-DK), Panel-Corrected Standard Errors (PCSE), and Feasible Generalized Least Squares (FGLS) estimators to test the relationship between these two variables rigorously.

The key assumption, that the high level of aggregate institutional quality produces a positive, statistically significant impact on financial inclusion, is highly supported by the empirical research. These results agree with the theoretical underpinnings of institutional economics, especially with the suggestion by North (1990) that institutions form the rules of the game that reduce the costs of uncertainty and

transactions. In the setting of financial markets, the findings of the study suggest that effective institutional structures, which are defined by the quality of regulation, anti-corruption legislation, and the rule of law, are not only macroeconomic stabilisers but key driving forces behind financial access.

Particularly, the analysis demonstrates that the institutional quality acts as a catalyst to financial inclusion because it creates a sense of trust and reduces entry barriers of financial service providers and underserved populations. In the European setting, where financial infrastructure is at a mature stage, institutional quality seems to propagate high rates of inclusion and the integrity of complex financial structure. On the other hand, in new Asian economies, the quality of institutions plays a central role in enhancing the fast pace of digitalisation of finance. The research highlights the fact that despite the opportunity of the unbanked to leapfrog offered by digital financial services, the success of such services depends greatly on a regulatory framework that will strike equilibrium between innovation and consumer protection as well as systemic stability.

In addition to that, the control variables, such as urbanisation, education, and domestic credit, have shown the desired positive relationships with financial inclusion, thus supporting the idea of a multidimensional problem. That said, the fact that the institutional quality variable remains the same in various model specifications highlights the fact that governance and legal systems are the non-negotiable requirements of sustainable financial inclusion. In the end, this study adds to the literature as it shifts the analytical eye, which is based on traditional economic determinants of financial depth, to the institutional determinants of financial breadth. It shows that financial inclusion is impossible to attain solely in terms of income growth, but it implies a strategic empowerment of the institutions that form the financial ecosystem.

As far as the four hypotheses formulated in Section 3 are concerned, the evidence is unambiguous. H1 is supported: aggregate institutional quality exerts a positive and highly significant effect on financial inclusion (IQ coefficient significant at the one-percent level in every specification). H2 is supported: this effect survives the inclusion of macro-financial and demographic controls and three estimators that correct for heteroskedasticity, serial correlation, and cross-sectional dependence, with the coefficient moving from 0.413 (FE-DK) to 0.225 (PCSE) to 0.193 (FGLS) but never losing significance. H3 is supported: the marginal effect of governance is larger in emerging Asian economies than in mature European ones, confirming the diminishing-returns pattern. H4 is supported: financial depth, human capital, and urbanisation are positively associated with inclusion, while trade openness is not inclusion-enhancing. The central thesis of the study, that institutional quality is a foundational rather than incidental determinant of financial inclusion, therefore holds across the full panel and within both regional sub-samples.

6.2 Policy Recommendations

The empirical results of this research are having far-reaching consequences on the way policymakers, central banks, as well as international development agencies work in the Asian as well as European environments. These findings indicate that the policy interventions should not just be a financial liberalisation but should include wholesomely instituting reforms.

As the digital financial services continue to grow rapidly in Asia, regulators should focus on regulatory quality. This does not imply deregulation but only the establishment of dynamic sandbox environments that are conducive to innovation in the financial technology industry and protect consumer interests and data privacy. Considering the instability of digital trust, clear and reliable regulatory frameworks need to be established to make unbanked people to move from the formal to informal digital financial platforms.

To make the financial institutions lend to marginalized populations and small-to-medium enterprises (SMEs), the risk of default and non-payment should be reduced. Governments should improve the efficiency of the judicial system in contract enforcement and the protection of property rights. Lenders who are confident that the legal framework that enforces the contracts will be found to be operating are more likely to be willing to decrease lending obstacles and offering services to increased-risk demographic groups.

The paper reveals the negative role that corruption plays in accessing finances. Bribery undermines the trust of the people in their financial intermediaries; it tends to misuse the resources that are to be used in the development of the financial sector based on the masses. Anti-corruption efforts in the financial regulatory institutions and state-owned banks in the emerging Asian economies should be clamped down by the policymakers as a measure of regaining confidence among the citizens. Reduction in corruption is a good indication to the market that the financial system is just and approachable, hence inviting people who had previously avoided it out of perception of graft to join the party.

The difference that has been noticed between the Asian and European samples indicates that the policies that are one-size-fits-all are not effective. To sustain the already high standards of inclusion and protect the vulnerable groups against shocks, European policymakers ought to continue working to keep the levels of high standards of governance. Policymakers in Asia, in their turn, ought to focus on the institutional capacity that can operate the speed at which digital financial innovation can proceed, including institutional infrastructure investment required to facilitate digital identification systems and harmonisation of payment systems across countries in the region, such as ASEAN.

To translate these findings into practice, the following region-specific and actionable recommendations are offered.

For emerging Asian economies (treat institutions as the primary lever). (i) Prioritize regulatory quality by establishing fintech regulatory sandboxes that pair innovation with consumer-data protection; (ii) strengthen contract enforcement and property-rights protection so lenders can safely extend credit to underserved households and SMEs, lowering risk premiums; (iii) intensify anti-corruption measures in financial regulators and state-owned banks to rebuild public trust and draw the unbanked into the formal system; and (iv) invest in the institutional infrastructure of digital finance- interoperable digital-ID systems and harmonised

cross-border payment rails (for example, across ASEAN) to convert fintech potential into measurable inclusion.

For advanced European economies (shift from access to quality and competition).

Given diminishing returns to further generic governance reform, policymakers should: (i) maintain existing high governance standards and safeguard them against shocks; (ii) prioritise competition and contestability through open-banking and interoperability frameworks (PSD2/PSD3) that prevent incumbents from retreating from low-margin rural and low-income segments; (iii) use strong institutional capacity to scale digital and embedded finance safely while extending data-portability rights under GDPR; and (iv) target the residual inclusion gaps that affect specific vulnerable groups, such as migrants, the elderly, and the digitally excluded rather than pursuing economy-wide reform whose marginal inclusion payoff is now small.

6.3 Limitations and Future Research Directions

Several limitations of this study open productive avenues for future research. First, the analysis relies on aggregate, composite indices; future work could disaggregate the IQ_Index to identify which specific governance dimensions (for example, rule of law versus control of corruption) matter most for each component of financial inclusion, and could disaggregate the FI_Index to separate digital from traditional access. Second, although the panel estimators correct for serial correlation, cross-sectional dependence, and heteroskedasticity, the design establishes robust association rather than definitive causality; future studies could exploit instrumental-variable or dynamic-panel (system-GMM) approaches, or natural experiments around specific institutional reforms, to sharpen causal identification. Third, the present comparison pools countries into two broad regions; subsequent research could test the diminishing-returns mechanism formally through interaction terms, threshold, or panel-smooth-transition models, or country-level fixed-slope estimates to map the full institutional-elasticity curve. Fourth, the sample covers Asia and Europe; extending the framework to Africa and Latin America would test the external validity of the "institutional scaffolding" argument. Finally, future work could incorporate demand-side and micro-level survey data (such as Global Findex individual responses) to examine how institutional quality interacts with financial literacy, gender, and income in shaping inclusion at the household level.

A further avenue concerns the COVID-19 pandemic specifically. While the present study treats the pandemic as a common shock that is absorbed by the cross-sectional-dependence corrections rather than modelled in isolation, future research could examine it explicitly- for example, by introducing a pandemic-period dummy or year interactions, by estimating structural breaks around 2020, or by testing whether the institutional effect on financial inclusion strengthened during the crisis. Such work would clarify whether strong governance acted as a buffer that preserved financial access during the shock, a hypothesis that the resilience pattern observed here suggests but does not formally isolate.

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Cite as: Islam, T., Ahmmed, S., & Hossain, B. (2026). *Does institutional quality enhance financial inclusion? Evidence from Asian and European countries*. *Jagannath University Journal of Business Studies*, 14(1), 21–50. <https://doi.org/10.5281/zenodo.21122950>