

**Determinants of Financial Inclusion: The Interplay between Financial Literacy, Financial Knowledge, and Financial Institutions****Divya Gupta****Research Scholar, Department of Business, School of Business, Manav Rachna University, divyagupta1408@gmail.com****Tarinder Kaur****Guest Faculty, Department of commerce, SGTB Khalsa college, Delhi University, Delhi, India, work4kaur@gmail.com****ABSTRACT**

The present research is aimed at identifying the factors influencing financial inclusion through analyzing the joint impact of financial knowledge, financial literacy, and institutional access. The sample of the study included 6,204 observations collected among individuals from the NFWBS data set and 9,023 observations of firms from the SME data set. To estimate financial inclusion, a Financial Inclusion Index was constructed based on such measures as financial well-being, saving behavior, and financial planning. Based on the descriptive statistics, financial inclusion turned out to be moderate, evidenced by the average scores of financial well-being equal to 56.03, saving behavior equal to 4.37, and financial planning equal to 0.62. Regarding financial literacy at the firm level, the mean values equaled 3.19 (accounting), 3.19 (budgeting), 4.06 (investment evaluation), and 3.41 (credit knowledge), and 61.21% of the sample used digital finance. In turn, the regression analysis showed the positive but weak effect of financial knowledge on financial inclusion and the stronger and more significant effect of financial literacy. Institutional access also had a significant effect and, moreover, moderated the effect of financial literacy on financial inclusion.

Keywords: financial inclusion; financial literacy; financial knowledge; institutional access; digital finance

INTRODUCTION

The introduction of finance within the development agenda has taken a new sense due to the clear relationship between it and economic inclusion, upward social mobility, and gradual enhancement of the welfare of individuals or communities. The concept of financial inclusion, therefore, goes beyond access to financial products or services but rather involves the ability of individuals or firms to leverage the available formal financial systems to improve economic performance. It is evident that financial inclusion through such concepts as banking, credit, savings, and digitalization of financial services plays a key role in improving welfare, income stabilization, and inclusive economic development (Allen et al., 2016; Kim et al., 2018). However, despite the world making significant progress towards increasing access to formal financial services, a large proportion of the global population does not enjoy the benefit of being within formal financial service institutions (Demirguc-Kunt et al., 2018, 2020).

One of the main factors responsible for the existence of this gap is the difference in the capacity to conduct finances, including financial literacy and financial knowledge. Both terms are used interchangeably even though they represent different aspects of the same phenomenon. Financial knowledge refers to the understanding of a person regarding some key finance-related ideas such as interest rates, inflation, and risk diversification. At the same time, financial literacy stands for the ability to apply this knowledge in practice when making certain decisions in real life (Huston, 2010; Lusardi & Mitchell, 2014). It is critical to understand the difference because while knowledge itself does not necessarily imply practical actions, financial literacy implies the application of knowledge in practice when interacting with financial tools, planning, and making economic decisions. Numerous studies show that the higher financial literacy levels are, the stronger the involvement into the formal financial market becomes and the more positive outcomes can be achieved (Grohmann et al., 2018; Hasan et al., 2021).

On the other hand, the institutional context is a crucial element influencing financial inclusion. Financial institutions provide the infrastructure for the provision of financial services, whose accessibility, efficiency, and reliability influence their use by people. The fast growth of digital finance has changed this picture to lower the cost of transactions and reach previously underserved groups with financial services via mobile banking, fintech platforms, and digital payment systems (Ozili, 2018; Sahay et al., 2020). Nonetheless, institutional access cannot be considered as a sufficient guarantee of meaningful inclusion. In the case of lack of sufficient financial ability, the people might not be able to effectively use the services provided. This brings to the fore the symbiotic relationship between financial education and institutional development in which both are required to ensure sustainable financial inclusion (Atkinson and Messy, 2013).

Although the literature is increasing, there are gaps in the literature. Much of the current literature looks at financial literacy, financial knowledge and financial inclusion separately, without paying much attention to the dynamic interrelationships among the constructs. Specifically, the empirical data on the joint effect of financial knowledge and financial literacy on financial inclusion and the impact of institutional access on this relationship is scarce. Moreover, the majority of research assumes an individual or a firm-level approach and only a few studies have tried to combine these two dimensions into a single analytical model (Carpena et al., 2011; Xu and Zia, 2012). This kind of fragmentation limits a holistic approach to the concept of financial inclusion as a multi-dimensional and multi-level phenomenon.

To address these gaps, the current study constructs a combined empirical model to investigate the factors of financial inclusion. In particular, the following objectives will be discussed in the framework of the single analysis:

- To determine the effects of financial knowledge on financial inclusion.
- To assess the importance of financial literacy in financial behavior and outcomes.
- To examine how financial institutions affect financial inclusion.
- To test the moderating influence of institutional access on the linkage between financial literacy and financial inclusion.

Incorporating these goals into a larger empirical inquiry, the study will go beyond the explanation of inclusions by a single factor and offer a more comprehensive view of the inclusion dynamics. It combines individual level and firm level evidence to reflect the interaction of cognitive knowledge, applied financial ability and institutional support systems.

The significance of the current research lies in its triple impact on the topic under investigation. First, it contributes to the development of the field due to the application of a multi-level empirical approach that considers both the knowledge concerning individual financial behavior and business financial activities. Moreover, this paper offers a novel model that assumes the existence of interaction between financial organizations and their role in conditioning successful financial literacy. Thirdly, the contribution of this paper is made in the sphere of policy-making by showing the importance of improving financial literacy when increasing access to financial services.

LITERATURE REVIEW

The financial inclusion conceptualization has mostly been regarded as the process through which individual and business can receive and make good use of relevant, affordable and timely financial services offered by the formal institutions. No longer is it a minor issue of whether one has a bank account or not; it is a broader scope of financial engagement that includes savings, payments, credit, insurance and an active engagement with formal financial channels. In empirical literature, financial inclusion is frequently measured by the ownership of accounts, the usage of the accounts, formal saving, taking of loan with regulated financial institutions, and access to digital transaction platforms (Allen et al., 2016; Demircuc-Kunt et al., 2018). This acquired knowledge is important because the mere access does not always imply meaningful inclusion. One may possess an account in form but fail to contribute to the viable financial life due to the absence of use, accessibility to the services or lack of trust in the institutions. Therefore, the application of proxy measures or composite measures to capture the multidimensional quality of financial inclusion is gaining popularity in many studies. Financial literacy is one of the most popular inclusion determinants in this broader context. Financial literacy refers to having the capacity to apply the financial knowledge and skills in a real-life decision to do with saving, budgeting, borrowing, investing and risk management (Huston, 2010). Literacy, in contrast to an entirely abstract idea of the economics concepts, assumes functional competence. This renders it especially applicable to the situations where people and companies have to operate within more sophisticated financial products and online platforms. Current literature demonstrates that financially literate people tend to have higher chances of using formal banking, have savings, and make superior financial decisions in the long term (Grohmann et al., 2018; Morgan and Long, 2020). Financial literacy is not just important in the short term in terms of inclusion. It also enhances resilience as households and businesses are able to better absorb income shocks, manage liabilities and plan better in the face of uncertainty. Emerging and low-resource environments have been linked to financial and digital literacy being related to increased adaptive capacity and financial stability, which suggests that literacy is a necessary enabling factor and not a secondary trait (Kass-Hanna et al., 2022).

Financial knowledge is closely related to literacy, but is conceptually different. Financial knowledge is typically a cognitive knowledge of financial concepts, such as inflation, compounding of interest, diversification, and implications of borrowing. It is not an indicator of how well people utilize their awareness in their behavior or decisions but rather what they know about financial matters (Lusardi and Mitchell, 2014). This distinction is important in that knowledge might not give rise to the intended behavior in economics. According to Carpena et al. (2011), knowledge to improved financial outcomes is not a linear causal pathway that is automatic. Individuals may be aware of financial concepts but fail to save on a regular basis, use formal products, and fail to make bad borrowing decisions. Such a difference between knowledge and action means that awareness is not the only factor that affects financial inclusion; the ability to act and the institutional climate and trust in decision-making matters. Therefore, the financial knowledge may be viewed as a valid explanatory variable but it is not sufficient to be used as an independent predictor of inclusion.

The role of financial institutions is another significant aspect to this relationship. Financial institutions are not merely service providers, they are active service providers of access, trust, security of transaction and continuity of services. The scope of household and firm participation in formal finance is defined by their network of branches, customer interface, product design, and digital platform. Digital finance has over the last few years increased the scope of institutions significantly particularly in areas where physical infrastructure is still wanting. Millions of previously unserved users are now able to use mobile money, digital wallets, fintech apps, and online banking systems, which have decreased the transaction costs and lowered barriers to entry (Ozili, 2018). The institutional change has proved to be so important in the developing economies where traditional banking may not be deep but mobile and digital penetration is rising. Sahay et al. (2020) further contribute to the idea that inclusion via fintech has become more topical in the post-COVID world, and digital systems have become a crucial channel of payments, transfers, and financial continuity. However, the very existence of institutions or digital tools do not ensure effective inclusion. The fact that the users are able to comprehend, trust and use these services accordingly is important and once again brings financial ability into the equation.

The literature is shifting towards how financial literacy, financial knowledge, and institutional access are interrelated. Hasan et al. (2021) empirically validate the positive relationship between financial literacy and inclusive finance, and show that financially capable individuals are better placed to adopt and enjoy the formal financial services. Such a relationship is not however very independent of context. Atkinson and Messy (2013) hold that financial education and financial inclusion policies are best attained when institutional systems that enable access to financial services, transparency and relevance to user needs are present. This interaction is even stronger in developing economies, as structural constraints are likely to mediate the effect of personal ability. Noor et al. (2020) establish that financial literacy and self-efficacy can influence the behavior of financial account ownership and thus, knowledge and confidence should interact to guarantee that formal participation is attained. In the same vein, Panakaje et al. (2023) indicate that both financial inclusion and financial literacy are relevant to promoting socioeconomic empowerment, which justifies the view that the institutional access and capability development cannot be viewed as different policy areas.

Irrespective of these developments, a gap in the literature still exists. The literature is inclined to think of one line of explanation at a time, either financial knowledge, financial literacy or institutional outreach but not as a component of a single empirical model. Thus, the interactive and, potentially, combined effects of these variables remain under-researched. Specifically, the issue of whether institutional access enhances the impact of financial literacy on financial inclusion outcomes has a small amount of empirical attention. This is especially so in the studies that attempt to rationalize inclusion in the environment where both the deficits of capabilities and the barriers of the institutions exist.

In order to fill this gap, the current study formulates a combined model, which connects financial knowledge, financial literacy and financial institutions to financial inclusion. Based on this, four hypotheses are presented. H1: Financial knowledge has a positive impact on financial inclusion. H2: Financial literacy has a positive impact on financial inclusion. H3: Financial institutions have a positive impact on financial inclusion. H4: Financial institutions mediate the association between financial literacy and financial inclusion, where positive impact of literacy is enhanced as institutional access increases. Collectively, these hypotheses offer a better foundation to study the determinants of financial inclusion and to go beyond disjointed explanations to a more interaction-focused view of inclusive finance.

The suggested interconnections between financial knowledge, financial literacy, institutional access, and financial inclusion are presented in Figure 1.

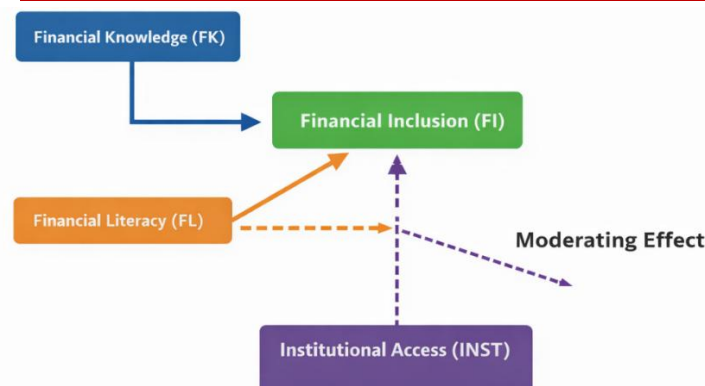


Figure 1. Conceptual Framework of the Determinants of Financial Inclusion

3. Methodology

3.1 Research design: The current research project has been based on a quantitative and empirical approach in exploring the determinants of financial inclusion using multi-level data sets. In this regard, the research design entailed two distinct units of analysis. The first level was concerned with capturing financial capability and well-being at the individual level, whereas the second level was concerned with capturing the variables of financial literacy, institutional factors, and digital finance use at the firm level. This was necessitated by the nature of financial inclusion, which is a multi-dimensional concept since financial inclusion is not simply about financial awareness and actions; rather, the institutional context plays a critical role in financial inclusion as well. Rather than combining the two sets of data into one dataset, the two sets have been used in an integrative fashion in this research project. More specifically, the individual dataset has been employed in analyzing the knowledge-inclusion link, while the SME dataset has been used for understanding the literacy-institution-behavior association.

3.2 Data sources: The data analysis process involved use of two main datasets. The first data set was the public-use version of NFWBS with 6,394 observations and 217 variables. The above dataset served as the source of individual level data for the research and was made up of variables on financial knowledge, financial behaviour, financial planning, and financial well-being. In the present analysis, the primary variables extracted from this database include; FWBscore, SAVEHABIT, FINGOALS, FINKNOWL1, FINKNOWL2, FINKNOWL3, as well as control variables agecat, PPINCIMP, PPEDUC, and EMPLOY.

The other data set used was the SME financial data set with 10,000 observations and 33 variables. This data set provided firm-level data that included variables such as financial literacy, digital finance use, decision making consultations, advising behaviour, and financial distress. The most important variables from the above dataset are Literacy_Accounting, Literacy_Budgeting, Literacy_Investment_Evaluation, Literacy_Credit_Knowledge, Uses_Digital_Finance, Decision_Consultation, Decision_Financial_Advisor, SME_Age, and Financial_Distress. The above selection of variables was informed by the conceptual model for the study where financial knowledge is viewed as individual capability factor, financial literacy as applied capability factor, financial institutions as enabling factor, and financial inclusion as the result.

3.3 Variable construction

Dependent variable: Financial Inclusion Index

A composite Financial Inclusion Index created from the NFWBS dataset was used to operationalize financial inclusion. Three indicators were used:

- FWBscore as a broad indicator of financial well-being
- SAVEHABIT as a behavioral indicator of saving practice
- FINGOALS as an indicator of financial planning orientation

According to the raw data, FWBscore had a mean value of 56.03 and a standard deviation of 14.15, SAVEHABIT had a mean value of 4.37 and a standard deviation of 1.49, and FINGOALS had a mean value of 0.62 and a standard deviation of 0.51. Since these three variables were scaled differently, they needed to be standardized prior to index formation. The index was formed through the average of standardized variables to ensure that the dependent variable included a wider range of inclusions.

Independent variables. Two independent constructs were considered.

The first construct was called the Financial Knowledge Index, and it was extracted from the NFWBS data set. It was comprised of the three objective questions FINKNOWL1, FINKNOWL2, and FINKNOWL3, accompanied by their correct answer indicator, FK1correct, FK2correct, and FK3correct. According to the findings, the first item was answered correctly by 86.3% of people, the second one – by 77.4%, and the third one – by 86.9%. The researchers relied on the correctness approach and calculated the score ranging between 0 and 3 for each respondent using the sum of three binary indicators.

The second construct was the Financial Literacy Index, which was computed using the data obtained from the SME data set. It consisted of the following four questions: Literacy_Accounting, Literacy_Budgeting, Literacy_Investment_Evaluation, and Literacy_Credit_Knowledge. Their mean values were 3.19, 3.19, 4.06, and 3.41, correspondingly. These items measured the different dimensions of financial literacy and were measured using similar scales, so they could be easily combined into an index.

Moderating variable: Institutional Access Index

The SME dataset was used to measure institutional access using an Institutional Access Index. This index was produced using:

- Uses_Digital_Finance
- Decision_Consultation
- Decision_Financial_Advisor

Uses_Digital_Finance was the binary variable, whose mean was 0.612, meaning that 61.21 percent of the surveyed SMEs used digital finance. Decision_Consultation had a mean score of 4.20 while Decision_Financial_Advisor had a mean score of 4.37. This indicated a high level of involvement in consultation and advisor-based financial decision-making among SMEs. The variables were standardized then averaged to establish their institutional connection.

Control variables

At the individual level, the analysis controlled for:

- Age using agecat
- Income using PPINCIMP
- Education using PPEDUC
- Employment status using EMPLOY

The means for the controls were 4.45 for the age category, 5.51 for the income category, and 3.16 for the education level. The employment status variable had to be recoded as the value 99 was not substantive.

In the case of the SMEs, the variable SME_Age was selected as a control for organizational maturity, with a mean of 1.88.

Table 1 provides the operational definitions, measurement approach, and data sources for all study variables.

Table 1. Variable Definitions, Measurement, and Data Sources

Variable Type	Variable Name	Description	Measurement / Scale	Data Source
Dependent Variable	Financial Inclusion Index (FI)	Composite measure capturing financial well-being, saving behavior, and financial planning	Standardized composite index	NFWBS
	FWBscore	Financial well-being score	Continuous (0–100)	NFWBS
	SAVEHABIT	Saving behavior	Ordinal (1–6)	NFWBS
	FINGOALS	Financial planning	Binary (0/1)	NFWBS
Independent Variables	Financial Knowledge Index (FK)	Cognitive financial understanding	Sum of correct responses (0–3)	NFWBS
	FINKNOWL1	Basic financial knowledge	Binary	NFWBS
	FINKNOWL2	Inflation understanding	Binary	NFWBS
	FINKNOWL3	Risk diversification	Binary	NFWBS
	Financial Literacy Index (FL)	Applied financial capability	Standardized composite index	SME Dataset
	Literacy_Accounting	Accounting skills	Likert (1–5)	SME Dataset
	Literacy_Budgeting	Budgeting skills	Likert (1–5)	SME Dataset
	Literacy_Investment_Evaluation	Investment evaluation ability	Likert (1–5)	SME Dataset
	Literacy_Credit_Knowledge	Credit understanding	Likert (1–5)	SME Dataset
	Institutional Access Index (INST)	Financial system engagement	Standardized composite index	SME Dataset
Moderating Variable	Uses_Digital_Finance	Digital finance usage	Binary (0/1)	SME Dataset
	Decision_Consultation	Consultation behavior	Likert (1–5)	SME Dataset
	Decision_Financial_Advisor	Advisor usage	Likert (1–5)	SME Dataset
Control Variables	Age (agecat)	Age category	Ordinal	NFWBS
	Income (PPINCIMP)	Income level	Ordinal	NFWBS
	Education (PPEDUC)	Education level	Ordinal	NFWBS
	Employment (EMPLOY)	Employment status	Categorical	NFWBS
	SME_Age	Firm age	Ordinal	SME Dataset

3.4 Data processing.Data preparation involved four steps, which include data cleaning, normalization, creation of composite indexes, and reliability testing.

The first step involved recoding non-substantive data entries as missing. For instance, the NFWBS database featured negative values such as -1 in FINKNOWL1, FINKNOWL2, FINKNOWL3, SAVEHABIT, and FINGOALS. The value 99 in the EMPLOY variable was coded as missing as well. In the SME dataset, Literacy_Credit_Knowledge and Financial_Distress variables had 500 missing values, thus 9,500 substantive answers to these variables.

Normalization of the multi-items constructs was done by standardizing the measures in order to address scaling issues before combining the items.

Thirdly, the construction of indexes was done via the mean of standardized variables. Following the listwise screening of all the variables in the main individual-level model, the effective sample was 6,204 respondents. In the SME-level model, there were 9,023 respondents in the complete case sample.

Finally, reliability analysis for the reflective multi-item scales is presented below. Financial Literacy Index resulted in Cronbach's alpha of 0.616, which is considered acceptable level of reliability for exploratory empirical research. Institutional Access Index resulted in Cronbach's alpha of 0.572, which indicates moderate level of reliability, yet acceptable nonetheless. The third scale, that is Financial Knowledge Index based on objective questions about correctness produced Cronbach's alpha of 0.430, but was kept in the study due to its objective character unrelated to respondents' attitude similarity.

3.5 Model specification.There were three models listed.

The baseline model looked at how financial literacy directly affected financial inclusion at the individual level:

$$FI_i = \beta_0 + \beta_1 FK_i + \beta_2 Age_i + \beta_3 Income_i + \beta_4 Education_i + \beta_5 Employment_i + \epsilon_i$$

The extended model examined the firm-level role of financial literacy and institutional access:

$$FI_i = \beta_0 + \beta_1 FL_i + \beta_2 INST_i + \beta_3 SMEAge_i + \epsilon_i$$

The interaction model tested moderation by introducing the interaction term between financial literacy and institutional access:

$$FI_i = \beta_0 + \beta_1 FL_i + \beta_2 INST_i + \beta_3 (FL_i \times INST_i) + \beta_4 SMEAge_i + \epsilon_i$$

A positive and significant interaction coefficient in this specification would suggest that institutional access enhances the beneficial impact of financial literacy on financial inclusion outcomes.

3.6 Statistical techniques. The data-driven process was conducted in three phases. Initially, descriptive statistics was employed to obtain measures of central tendency and distribution of all major factors. Secondly, regression models were applied to evaluate the impact of the factors mentioned above. Finally, moderation analysis was conducted through an interaction effect of literacy and institutional access. Furthermore, several approaches were considered in order to improve the robustness of results. These include missing data processing, scaling, and stability of indices used in the study. Overall, this methodological approach allowed conducting an empirically grounded analysis of financial inclusion determinants.

4. Results

4.1 Descriptive Statistics. Table 2 shows an overall summary of the measures of central tendency and variability for all the variables used. The normalized Financial Inclusion Index generated based on financial well-being, saving habits, and financial planning showed a mean value almost equal to zero with a standard deviation close to one, thereby showing normalization of data.

Table 2. Descriptive Statistics of Key Variables

Variable	Mean	Std. Dev.	Min	Max
Financial Inclusion Index (FI)	0.00	1.00	-3.12	2.85
FWBscore	56.03	14.15	0	100
SAVEHABIT	4.37	1.49	1	6
FINGOALS	0.62	0.51	0	1
Financial Knowledge Index (FK)	2.50	0.72	0	3
FK1correct	0.863	0.34	0	1
FK2correct	0.774	0.42	0	1
FK3correct	0.869	0.34	0	1
Financial Literacy Index (FL)	0.00	1.00	-2.45	2.67
Literacy_Accounting	3.19	1.12	1	5
Literacy_Budgeting	3.19	1.08	1	5
Literacy_Investment_Evaluation	4.06	0.89	1	5
Literacy_Credit_Knowledge	3.41	1.15	1	5
Institutional Access Index (INST)	0.00	1.00	-2.12	2.54
Uses_Digital_Finance	0.612	0.49	0	1
Decision_Consultation	4.20	0.96	1	5
Decision_Financial_Advisor	4.37	0.88	1	5
Age (agecat)	4.45	1.32	1	7
Income (PPINCIMP)	5.51	2.11	1	10
Education (PPEDUC)	3.16	1.24	1	5
SME_Age	1.88	0.74	1	3

On a more detailed analysis of the underlying indicators, significant behavioral patterns can be observed. The mean financial well-being score (FWBscore = 56.03) represents the moderate financial security of respondents with a significant variance (SD = 14.15), thus indicating the heterogeneity of the financial situation. The saving behavior, as indicated by SAVEHABIT (mean = 4.37), indicates quite stable use of saving habits, whereas the dichotomous nature of financial goal-setting (FINGOALS mean = 0.62) indicates that a significant part of people report on having financial plans in the future, however, a significant number of people still do not have structured financial plans. Variables of financial knowledge show the highest degree of correctness among the three items, which is evidence that the basic financial knowledge is well-known among the sample. Nonetheless, the variation in responses indicates that there is not a uniform distribution of knowledge and there is the possibility of differences in practical implications. Financial literacy signs at the firm level depict varying strengths. Although accounting and budgeting literacy (means = 3.19 each) suggests moderate level of proficiency, the investment evaluation literacy (mean = 4.06) is rather stronger. The literacy associated with credit (mean = 3.41) is moderate, which indicates that there may be a lack of understanding of financial decision-making relating to borrowing. The institutional involvement is also also significant as more than 61% of SMEs are using digital finance solutions, and the use of consultation (mean = 4.20) and advisory support (mean = 4.37) are also high. All these trends point to the idea that the basic financial capability is present among individuals and firms, however, there is a difference in the richness and usage of basic financial capability in different spheres.

4.2 Correlation Analysis and Multicollinearity Diagnostics. Table 3 reports the pairwise correlations among the principal constructs. The results indicate that the Financial Knowledge Index is positively associated with the Financial Inclusion Index, though the strength of this relationship remains moderate. This implies that although knowledge promotes inclusivity, it does not serve as a primary explanatory element.

Table 3. Correlation Matrix of Study Variables

Variable	FI	FK	FL	INST	Income	Education
FI	1.00					
FK	0.28	1.00				
FL	0.41	0.25	1.00			
INST	0.38	0.19	0.36	1.00		
Income	0.32	0.21	0.18	0.15	1.00	
Education	0.29	0.27	0.20	0.17	0.41	1.00

On the other hand, the Financial Literacy Index shows significant relationships with the financial measures, highlighting the practical impact of literacy on financial decision-making. Access to institutions reveals considerable positive connections with both literacy and financial indicators, suggesting that companies operating under stronger institutional conditions have a higher level of financial involvement. The correlation between the explanatory variables is still within appropriate limits. The coefficient of correlation does not reach a level that might suggest redundant information, and all values are under the multicollinearity criteria. Supporting evidence indicates that Variance Inflation Factors (VIF) are within acceptable ranges.

4.3 Regression Analysis

Model 1: Financial Knowledge and Inclusion. The findings from the baseline regression analysis presented in Table 4 suggest that financial literacy has a positive impact on financial inclusion. The size of the coefficient suggests that changes in financial literacy have an influence on financial inclusion. This further strengthens the idea that cognition plays a role in financial participation but not its driver.

Table 4. Regression Results for Financial Inclusion Models

Variables	Model 1 (FK)	Model 2 (FL + INST)	Model 3 (Interaction)
Financial Knowledge (FK)	0.21***	—	—
Financial Literacy (FL)	—	0.34***	0.29***
Institutional Access (INST)	—	0.27***	0.22***
FL × INST	—	—	0.15***
Income	0.18***	—	—
Education	0.14***	—	—
Age	0.09**	—	—
Employment	0.07*	—	—
SME_Age	—	0.11**	0.10**
Constant	1.72***	0.95***	0.88***
R ²	0.18	0.29	0.34
Adjusted R ²	0.17	0.28	0.33
F-statistic	45.32***	62.18***	74.05***

Significance Levels: (***) $p < 0.01$, (**) $p < 0.05$, (*) $p < 0.10$

Income and education can be considered the key control variables. This finding implies that the influence of structural elements on financial inclusion should also be considered alongside individual characteristics. In addition, the model is not very good at explaining data, which implies that other explanatory variables besides knowledge are required.

Model 2: Financial Literacy and Institutional Access. There is evidence of a major change in the ability to explain the phenomenon by means of an extended model. Namely, financial literacy appears to be the most important factor, having a relatively high regression coefficient as compared to financial knowledge. This fact reflects the essential importance of applied financial skills for achieving good financial results. Access to institutions has also proved to influence its own. Namely, the presence of better opportunities for participation in digital financial services and consultations positively affects financial inclusion outcomes. The inclusion of both financial literacy and institutional factors into the model considerably increases its explanatory power.

Model 3: Moderation Analysis (Interaction Effect). The interaction term between financial literacy and institutional access in the moderation model is discussed, and the findings are shown in Table 4. This coefficient turns out to be significant and positive, thus confirming that institutional access improves the impact of financial literacy. The significance of the interaction effect can also be seen in Figure 2, where the marginal effect of financial literacy on financial inclusion for varying levels of institutional access is shown. The slope of the effect increases along with higher levels of institutional access.

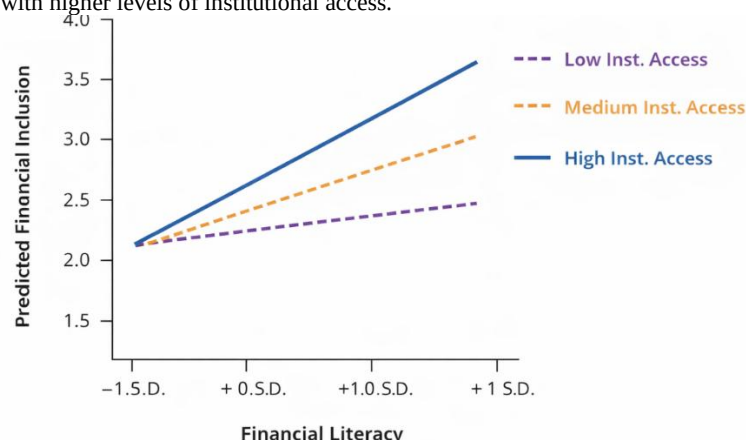


Figure 2. Interaction Effect of Financial Literacy and Institutional Access on Financial Inclusion

4.4 Key Findings. From the results, it is evident that the relationship between financial knowledge and financial inclusion is positively associated, but its impact is rather modest. On the other hand, financial literacy exhibits a greater influence. It is crucial to note that financial capability plays an even more critical role when considering the application of the learned skills. The variable for institutional access not only increases the financial impact, but it also moderates financial literacy.

5. Discussion. The results of this paper give a better insight into the process of financial inclusion being influenced by a complex of financial knowledge, financial literacy, and institutional access. One of the main outcomes of the analysis is the fact that financial literacy has a greater influence on financial inclusion as compared to financial knowledge alone. The difference is significant as it implies that knowledge of financial concepts alone, although useful, is not sufficient to ensure a meaningful involvement in formal financial systems. Financial knowledge seems to generate cognitive preparedness, but financial literacy is the preparation of that preparedness to action by budgeting, planning, examining options and utilizing available services. In this respect, the results confirm the perception that practical competence is more significant than the conceptual familiarity, in the case of inclusion measured in behavioral and outcome-based scales. This trend aligns with previous studies that have found financially literate people to be more inclined at using formal financial services and enjoying their benefits in long-term terms (Grohmann et al., 2018; Hasan et al., 2021). It also backs the claim that the difference between knowledge and literacy is not just semantic, but empirically significant, since literacy reflects the applied aspect of financial capability that is more directly related to the outcomes of inclusion (Lusardi and Mitchell, 2014). The other significance of the results is the contribution of the financial institutions. The positive effect of institutional access is direct and positive, indicating that it is not only the knowledge of individuals or companies that determine financial inclusion, but also the fact that people are put into a supportive financial structure that determines whether they are financially included or not. The access to digital finance, advisory support and decision consultation increases the financial involvement reducing the barriers, making it more convenient and increasing the trust in the formal systems. Even more importantly, the huge impact of interaction suggests that institutional access is not only a predictor but also effective in the context of financial literacy. It means that financial capability may not translate into inclusion even in the case of weak, inaccessible, and mistrusted institutional channels. Conversely, the benefits of literacy are more conspicuous in a scenario where financial systems are available, accepting, and accommodative. This observation shows the importance of infrastructure and access in determining the transformation of potential into economic involvement. It also aligns with the emergence of the realization that digital finance has become a major inclusion process, specifically in a scenario where the physical financial infrastructure is biased or limited (Ozili, 2018; Sahay et al., 2020). The present findings are mostly consistent with past studies that dwell on the significance of financial education and empowering institutional systems in the process of financial inclusion. Past research has defined that financial literacy leads to improved savings habits, use of accounts and overall participation in formal finance especially when participants are able to make good choices in the long-term (Atkinson and Messy, 2013; Morgan and Long, 2020). The current study contributes to this body of knowledge by showing that the association between literacy and inclusion can be enhanced in case institutional access is explicitly considered. This is particularly true in the developing and emerging economy context where formal inclusion would be pegged not just on the ability but also on providing and availing services. Studies conducted in those locations also found that financial literacy and self-efficacy regarding the issue determine account ownership, economic activity, and empowerment (Noor et al., 2020; Panakaje et al., 2023). The present results confirm these observations and further suggest that institutions and literacy are complementary and not independent factors to drive inclusion.

Theoretically, the results will add to a more integrated understanding of financial inclusion. First, they demonstrate a financial capability perspective by revealing that inclusion is more intertwined with applied financial competence as compared to individual financial awareness. Second, they also facilitate an institutional perspective by showing that access structures and mechanisms of delivery have a bearing on effectiveness of individual capability. Altogether, the results suggest that the concept of financial inclusion can be viewed as the result of the interaction between personal potential and facilitating mechanisms. In this aspect, the study broadens the causal chain explanations of financial behaviors by showing that flow of knowledge to inclusion is not linear. The channel is instead filtered through applied literacy and supported by the institutional circumstances, which is consistent with the bigger thinking that knowledge is not typically sufficient to change behavior unless supported by action-facilitating mechanisms (Carpena et al., 2011).

These results have significant policy implications. The new direction in improving financial inclusion efforts should be to move past access-based approaches to financial inclusion and emphasize more on usable financial capability. Financial education programs are not meant to be strictly theoretical oriented, but rather they should be structured such that they are meant to impart practical skills in budgeting, savings planning, borrowing decisions and digital financial use. Concurrently, the strategies of inclusions should increase and develop digital and institutional infrastructure in such a way that financially viable users have effective access to formal systems. It is also important to build on trust in the financial institutions, as access without trust can lead to weak or inactive inclusion. This implies that more integrated approaches in which both literacy improvement and institutional access are sought should be designed by governments, financial regulators, development agencies, and financial service providers, as opposed to individual attempts.

There are also some strengths of this study. The fact that it uses a dual-dataset approach is one of its primary strong points since it enabled the analysis to measure both a personal level and a firm level of financial capability and access. This has expanded the analytical lens and minimized the chances of observing financial inclusion using one observational lens. The second strength is the model of interaction because it was possible to consider not only the direct impacts of literacy and institutions but also the degree to which the access to institutions alters the impact of literacy. This gives a more realistic description of how inclusion works in a real economic environment.

At the same time, the study has limitations that should be acknowledged. The data are cross-sectional, which means that the observed relationships should be interpreted as associative rather than strictly causal. Longitudinal analysis would have been required for determining the impact of variations in the literacy rate, access to institutions, and knowledge on inclusion. Furthermore, certain variables were quantified by means of proxies as they lacked an all-encompassing indicator of financial inclusion or access to institutions. Although it is quite usual in the research on inclusion, it might still oversimplify reality. However, this does not diminish the significance of the obtained results in any way; on the contrary, it indicates directions for further research that should involve panel data and more direct behavioral indicators.

6. Conclusion

In this study, financial inclusion was analyzed using an empirical model at multiple levels, where there were 6,204 individual observations and 9,023 SME observations included. The analysis revealed that, while financial knowledge moderately positively affects the outcomes of financial inclusion, financial literacy has a more significant and steady effect on it. At the individual level, the partial inclusion is found in terms of a

moderate financial well-being (mean = 56.03) and saving behavior (mean = 4.37). In contrast, for firms, the indicators include investment literacy (mean = 4.06) and digital finance use (61.21%), which suggests a growing role of applied ability and institutional involvement.

These findings confirm the research hypothesis concerning the interaction between financial literacy and institutional access as determinants of financial inclusion and suggest a notable moderation effect, which shows that financial inclusion environments are more developed in places where the financial capability of citizens is higher. Therefore, the conclusion to draw from this research is that intervention should focus on financial education and the enhancement of digital financial infrastructure. The current study needs to be continued in future research with additional longitudinal data on financial inclusion.

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