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The Influence of Financial Inclusion on Stock Market Participation in Nepal: Exploring the Mediating Effect of Financial Knowledge

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ABSTRACT

This paper focuses on financial inclusion (FI), a fast-embracing topic with potential drivers of economic growth and the improvement of individual financial well-being. This study contributes to the existing literature by analysing how financial inclusion influences stock market participation (SMP) in Nepal, explicitly emphasising the intermediary role of economic knowledge. The study employed a causal-comparative research design, and the data were collected from 403 individual investors actively participating in the Nepal Stock Exchange (NEPSE) trading. The statistical tools used to meet the objectives of this research are descriptive statistics, factor analysis, and structure equation modelling. The study results show that FI and knowledge influence individual investor participation in the stock market. The result also indicates that FI is positively related to stock market activity, while it is essential to enhance citizens' FK significantly. Further, mediation analysis shows that FK partially mediates the relationship between FI and SMP. This suggests its pivotal role in narrowing the gap between access to financial services and actual investment behaviour. These findings underscore the critical role of FI in creating an inclusive and participatory financial ecosystem within Nepal. Longitudinal data in future research can capture the evolving dynamics of FI and its long-term impact on SMP.

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1. INTRODUCTION

One way to define financial inclusion is that it makes financial services accessible to all people and businesses, especially those excluded from the formal financial system. Like most developing countries, Nepal is working towards deepening financial inclusion to accelerate economic growth and poverty alleviation [1]. The Nepal Stock Exchange was

established 1993 as the country's premier bourse. However, investors' participation in Nepal's stock market remains relatively low compared to neighbouring nations.

Many studies have revealed the complex association between FI and SMP in various contexts. Evidence shows that more accessible access to a broader range of financial services might significantly increase people's willingness to invest in stocks [2], [3]. Financial inclusion initiatives aim to Mobilize savings, facilitate access to loans, and provide the primary education needed to diversify investment portfolios. These complex interactions among financial inclusion (FI), financial literacy (FL), and stock market participation (SMP) have significant implications for policymakers and relevant stakeholders in improving financial inclusion and enhancing capital market engagement in Nepal.

Literature in this respect reiterates that FI is essential in engendering economic growth, reducing poverty, and promoting income equality and financial stability across Asia. Given this, Ratnawati [4] established that increased FI, proxied by outreach and access to banking services, has enormous potential for impacting socioeconomic indicators. Complementing this view, Huang et al. [5] Illustrated how access to financial services drives economic growth, impacting different income groups in diverse ways. Suwaji and Agustedi [6] claimed that FI and literacy are crucial for making a sound investment decision and corporate success, meaning the business environment becomes more enabling when these indices are better. Underpinning this, more recent studies have established the inter-relationship between FI, literacy, and SMP, thus showing their combined importance in economic development [7], [8]. According to Shrestha [9], Nepal needs to intensify its agenda on FI. Nepal was rated below its South Asian peers for access to formal financial services and usage - lower than Sri Lanka or India.

Dhungana et al. [10] investigated the role of FI in inefficient monetary policy transmission in Nepal. Their research indicated how a sound financial structure might foster FI and, thereby, monetary policy effectiveness. This, therefore, established a core role of FI in checking inflation and thus established a benchmark for measuring the effectiveness of initiatives in monetary policy. This aspect is instrumental in helping policymakers, economists, and every other FI understand how FI affects SMP in Nepal. The research may also contribute to the literature on how FI policies enhance involvement in capital markets, channel savings into productive sectors, and promote economic growth.

The research covers how much FI in Nepal affects SMP, what mediation factors have been involved, and what socioeconomic variables have played, apart from how effective the current policies have been. Moreover, there is a lack of studies where more advanced statistical methods are used to explore the relationship between FI and SMP, as can be evidenced by including structural equation modelling (SEM). Furthermore, little attention is given to identifying those variables that might mediate the relationship, such as financial knowledge (FK), to clarify how and why FI affects SMP. Finally, a very superficial look at how socioeconomic factors interact with FI to influence participation in the stock market, especially for the currently excluded, calls for more targeted research. Filling these gaps is essential to comprehensively comprehend how FI and SMP relate in Nepal.

Čihák et al. [11] they explored the multidimensionality of FI, outlining four dimensions: access, usage, welfare, and quality. These dimensions build on extensive and inclusive criteria by which individuals and businesses enter the formal financial system. Terzi [12] added that SMEs need FI primarily because access to finance enhances operational effectiveness. Researchers argue that increasing FI among SMEs can significantly improve financial stability in any country.

Giang et al. [13] highlighted how small business performance is powerfully driven by FI against the backdrop of persisting problems associated with asymmetric information despite improved financial literacy. Optimal financial literacy and inclusion capacitate business stakeholders to harness their financial potential in making strategic decisions, exploiting opportunities and funding, and responding to the ever-changing dynamic business environment by improving performance. Demirguc-Kunt [3] demonstrated that higher degrees of FI are related to progress in the mainstream financial system's depth, access, and efficiency. A sound financial system is pro-inclusive and would help reduce the gap in income between the rural and urban areas of any economy. A solid financial system promotes inclusion and helps reduce income disparities between rural and urban areas [14]. Ahamed and Mallick [15] examined the affiliation between FI and financial stability in 86 countries and found a significant positive relationship, according to Saraswati et al. [16], fintech has addressed some of the challenges to financial inclusion for people without formal banking services.

FI significantly influences financial stability, economic growth, poverty alleviation, and income inequality, as Ratnawati [4] demonstrated, evaluating its impact on various macroeconomic indicators in Asia. Similarly, Anarfo et al. [17] investigated the interaction between FI, stability, and regulation in Sub-Saharan Africa, highlighting the crucial role of stability and regulation in fostering inclusion and supporting financial stability globally and regionally.

Amidu et al. [18] used probit regression analysis and two-stage least squares to examine Ghanaian households, uncovering a connection between FI, livelihood activities, and overall engagement. Akpene Akakpo et al. [7] showed a significant relationship between FL and SMP in the Ghanaian context. In contrast, Suwaji and Agustedi [6] although FL significantly affects investment decisions and business performance, FI does not have a notable impact.

Ofosu-Mensah Ababio et al. [19] and Mishra et al. [20] have tested the link between FI and the financial system growth of developing and frontier markets. It has been found that Ababio, through data findings in 35 countries using the GMM estimation method and the work by Mishra on India and other emerging economies, elicited the contribution of FI toward financial systems. In a cross-country survey, Lusardi and Mitchell [21] found evidence that people with FL are more likely to invest in the stock market or other financial assets. Similarly, Van Rooij et al. [22] observed a positive relationship between FL and participation in the stock market among Dutch households. Hastings et al. [23] showed the role of financial education programs in enhancing the likelihood of stock market participation. Likewise, Mandell and Klein [24] found that

financial education positively correlates with a person's SMP. Combined, the studies indicate that a person's FK is a critical determinant of his or her SMP.

Dhungana et al. [10] examined the impact of FI on monetary policy transmission in Nepal. With evidence from data spanning the period 1975–2019, the study demonstrates that FI significantly influences monetary policy effectiveness in both the short and long run. It also proposes strategies to improve FI, including adopting digital technology, promoting FL, and expanding the financial infrastructure to strengthen monetary policy efficiency in Nepal. Subedi [25] found that FL influences personal saving, risk tolerance, investment opportunities, and financial comprehension. Moreover, Shrestha et al. [26] demonstrated that financial behaviour, attitude, knowledge, and skills substantially impact individuals' choices regarding stock market investments.

These empirical investigations underscore the pivotal role of FI in encouraging SMP across diverse regions and countries. These studies consistently emphasize the importance of broader financial market access, promoting a more inclusive investment environment. These insights highlight the need for policymakers and stakeholders to prioritize initiatives aimed at enhancing FI, ultimately strengthening SMP, and fostering economic empowerment on a global scale.

1.1. Development of Conceptual Model of the Study

A conceptual model has been developed to address the research gaps identified in the literature review and achieve the study's core objectives. FI is the independent variable in this model, representing individuals' access to financial instruments and services. FK is the mediating variable, reflecting individuals' understanding of financial concepts and products. Finally, SMP is the dependent variable, indicating the degree to which individuals engage in stock market investments.

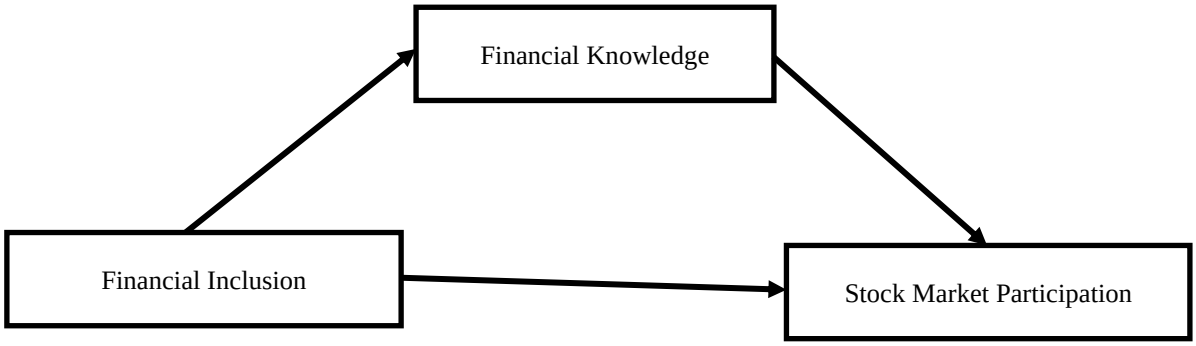

Figure 1. Conceptual Model of the Study

1.2. Development of Hypothesis

Financial Inclusion and Stock Market Participation

Demirguc-Kunt and Klapper [27] found a significant relationship whereby improved access to banking services and financial products positively correlates with increased participation in formal financial markets, specifically in the stock market.

Similarly, Beck et al. [2] contended that programs for FI, through their enhanced access to credit and banking, better equip people to invest in financial assets like stocks. Moreover, Allen et al. [28] further emphasized the role of FI in influencing investment behaviour in a study where they observed that better access to finance increases the probability of investing in stocks and other securities.

H_1: FI significantly impacts the SMP of individual investors.

Financial Knowledge and Stock Market Participation

In a broad cross-country survey, Lusardi and Mitchell [21] found evidence that people with FL are much more likely to invest in stocks and other financial assets. Similarly, Van Rooij et al. [22] noted a positive relationship between FL and SMP among Dutch households. Hastings et al. [23] demonstrated that financial education programs raise the chances of an individual participating in the stock market by a wide margin. Similarly, Mandell and Klein [24] found that financial education increases people's propensity for stock market activities. These studies pinpoint the role of FK in affecting individual investors' participation in stock market activities. Furthermore, Shrestha et al. [26] have highlighted that financial behaviour, attitude, knowledge, and skills significantly impact investment decisions, thus establishing a critical link between financial literacy and investment activities.

H_2: FK significantly impacts the SMP of individual investors.

Financial Inclusion and Financial Knowledge

Demirguc-Kunt and Klapper [27] established a compelling link between enhanced financial inclusion and household-level FK. Similarly, Agarwal et al. [29] illustrated that efforts to extend banking services to rural regions significantly boosted FL levels among previously underserved communities. Additionally, Lusardi and Mitchell [21] showed that individuals with access to formal financial services are more likely to seek financial education, enhancing their financial knowledge.

H_3: FI significantly impacts the FK of individual investors.

Financial Inclusion, Financial Knowledge, and Stock Market Participation

Chen and Volpe [30] found that FK partially mediates the relationship between financial education programs and investment behaviour. Similarly, Fernandes et al. [31]showed that FL is an intermediary between financial advice and investment decisions. Empirical research by Hung et al. [32] further, FL explains the connection between FI measures, such as banking access, and household investment behaviour. Moreover, Hastings et al. [23] revealed that financial education programs that enhance financial knowledge are crucial in bridging FL and investment outcomes.

H_4: FK mediates the relationship between FI and SMP of individual investors.

2. METHOD

This study adopted a causal-comparative research design and employed roster method selection to select 403 individual investors from the Nepal Stock Exchange

(NEPSE) as the sample, determined using Cochran's formula [33] for proportionate representation. The study utilized a 5-point Likert-scale survey questionnaire. The survey was conducted in March 2024 in the Nepalese capital market, i.e., the Nepal Stock Exchange (NEPSE). The questionnaire was distributed among the chosen investors, who were requested to provide responses reflecting their perceptions and experiences. The data collected through the questionnaire constituted the basis for analysis in the study. The study design incorporated empirical data analysis, employing statistical software such as SPSS 26 and AMOS 22.

Structural Equation Modelling (SEM)

SEM is a statistical technique used in research to examine and build complex relationships among variables. It enables researchers to explore and evaluate theoretical models that include both directly observed (measured) and unobserved (latent) variables [34]. In this study, SEM is utilized to validate financial inclusion's influence on individual investors' stock market participation, a construct derived through exploratory factor analysis (EFA) and previously examined for reliability using Cronbach's alpha test.

Table 1. Variables and their definitions

Construct	Items	Observed Variables	Descriptions
Financial Inclusion (FI)	FI1	Accessibility of financial services	Easy accessibility to various financial services such as banking, credit, and insurance.
	FI2	Information and support for financial decisions	Financial institutions provide sufficient information and support to make informed financial decisions.
	FI3	Financial resources utilisation	Respondents' ability to utilize financial resources to meet their financial needs and goals.
	FI4	Inclusive financial programs and initiatives	The community offers inclusive financial programs and initiatives.
Financial Knowledge (FK)	FK1	Diversifying investments	Investing in different assets reduces risk.
	FK2	High return investment	Investments that offer high returns are often associated with high levels of risk.
	FK3	High inflation	High inflation indicates that the cost of living is rising quickly.
Stock Market Participation (SMP)	SMP1	Informed investment decisions	Ability to make informed investment decisions in the stock market.
	SMP2	Stock market trends	Actively monitoring stock market trends to stay informed about investment opportunities.
	SMP3	Stock market investment	Investing in the stock market is essential for long-term financial strategy.
	SMP4	Stock market significance	The stock market offers significant potential for wealth accumulation.
	SMP5	Risk in stock market	Comfortability with the level of risk associated with investing in the stock market.
	SMP6	Stock market transactions	Participating in the stock market by buying and selling stocks or other securities.

3. RESULTS AND DISCUSSION

3.1 Descriptive Statistics

Table 2. Descriptive Statistics of Study Variables

Variables	Mean	S.D.	Skewness	Kurtosis
FI	3.9479	0.47717	-0.012	0.142
FL	4.0827	0.52288	0.050	-0.693
SMP	4.1117	0.48221	-0.970	5.047

Source: Authors' Computations from Survey Data, 2024

In Table 2, the mean values indicate general agreement among respondents about the influence of FI (mean = 3.948) and FK (mean = 4.083) on SMP. Similarly, the average response for SMP (mean = 4.112) also reflects a tendency towards agreement. The skewness and kurtosis values fall within acceptable ranges (-2 to +2 for skewness and -7 to +7 for kurtosis), suggesting that the normality assumptions are not violated and the data is suitable for analyses that assume multivariate normality.

3.2 Inferential Analysis

This study analyzed data using SPSS and SEM to drive conclusions. First, using principal component analysis, EFA was conducted using SPSS version 26 to identify the underlying factor structure. After that, applying a two-stage approach with Amos version 22 validated the research model. The research used exploratory factor analysis to identify underlying factors, employed a measurement model for data validation, and applied a structural model to assess each parameter's significance, direction, and magnitude.

3.3 Exploratory Factor Analysis

The EFA was conducted with varimax rotation to verify the appropriateness of the measuring scales used in the study to measure the constructs under evaluation and to ascertain whether those scales helped test the hypotheses or validly captured the phenomenon under study.

Table 3. KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.802
Bartlett's Test of Sphericity	Approx. Chi-Square	1901.14
	Df	153
	Sig.	0

Source: Authors' Computations from Survey Data, 2024

With a KMO value of 0.802, the high degree of sampling adequacy thus exists since this is above the recommended value of 0.6. Bartlett's Test of Sphericity was highly significant: $\chi^2 = 1901.140$, df = 153, with $p < .05$. This significant result supports the factorability of the correlation matrix, reinforcing the appropriateness of employing factor analysis as a robust method for extracting underlying factors in the dataset. Further, the

rotated matrix discloses that factor loadings for all acquired constructs exceed 0.5, aligning with the research criteria.

3.4 Measurement Model

This study used CFA to assess the measurement model using AMOS 22. The following two major critical validity assessments were utilized to ensure the reliability of the measurement instruments: convergent and discriminant validity. Convergent validity posits that evaluations focused on similar or closely related constructs should exhibit significant correlations. Fornell's composite reliability (CR) value surpassed 0.7 [35], indicating robust convergent validity. Discriminant validity evaluates how distinctly the components in the model are related to one another. It is confirmed when the average variance extracted (AVE) for each construct is more significant than both the maximum shared variance (MSV) and the construct correlation (r).

Table 4. Assessment of Reliability and Validity

Items	Loadings	Alpha	CR	AVE	MSV
Financial Inclusion		0.709	0.712	0.617	0.234
FI1	0.632				
FI2	0.646				
FI3	0.638				
FI4	0.553				
Financial Knowledge		0.609	0.618	0.588	0.132
FK1	0.596				
FK2	0.717				
FK3	0.452				
Stock Market Participation		0.756	0.764	0.591	0.234
SMP1	0.658				
SMP2	0.640				
SMP3	0.574				
SMP4	0.591				
SMP5	0.585				
SMP6	0.496				

Source: Authors' Computations from Survey Data, 2024

The results of loadings, reliability, and convergent validity are depicted in Table 4. Construct reliability was assessed using the results from Cronbach's Alpha and Composite Reliability measures. Cronbach's Alpha for each construct was above the threshold suggested by [36]. The composite reliabilities ranged from 0.618 to 0.756, which, although some values fell below the 0.70 benchmark suggested by [37], still confirmed the reliability of the constructs overall. Next, convergent validity was tested by computation of construct reliability (CR) that depends on Cronbach's Alpha and average variance extracted. All constructs with AVE values above 0.50 confirmed convergent validity, per Fornell and Larcker's benchmark [38].

Table 5. Assessment of Discriminant Validity

Constructs	AVE	MSV	MaxR(H)	FI	FK	SMP
FI	0.617	0.234	0.715	0.786		
FK	0.588	0.132	0.651	.246**	0.767	
SMP	0.591	0.234	0.769	.366**	.243**	0.769

Source: Authors' Computations from Survey Data, 2024
*"Note(s): *** means significant at 0.01 significance level."*

The Fornell and Larcker Criterion were used to test the discriminant validity, which is an integral element in proving the uniqueness of the constructs. The criterion by Fornell and Larcker states that there is discriminant validity in case the square root of the average variance extracted for each construct is more significant than its correlations with other constructs. In this study, the square root of AVE for each construct - FI = 0.786; FK = 0.767; SMP = 0.769 - exceeds its correlations with the other constructs, confirming its discriminant validity. The average variance explained also exceeds the maximum shared variance, indicating AVE > MSV. Thus, the study validated discriminant validity by establishing that the AVE > MSV across all constructs.

Table 6. Model Fit Indices of Measurement Model

Measure	Estimate	Threshold	Interpretation
CMIN/DF	1.843	Between 1 and 3	Excellent
GFI	0.958	>0.90	Excellent
CFI	0.948	>0.95	Acceptable
TLI	0.934	>0.90	Excellent
SRMR	0.053	<0.08	Excellent
RMSEA	0.046	<0.06	Excellent
PClose	0.686	>0.05	Excellent

Source: Authors' Computations from Survey Data, 2024
"Notes: CMIN/DF = Relative Chi-Square, GFI = Goodness of Fit Index, CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, SRMR = Standardized Root Mean Squared Residual, RMSEA = Root Mean Square Error of Approximation, RMR = Root Mean Squared Residual."

The overall goodness of fit was assessed using the following model-fit metrics: CMIN/df, GFI, CFI, TLI, SRMR, and RMSEA. The values were all at the threshold of standard acceptability [39], [40]. As detailed in the table, the three-factor model encompassing financial inclusion, financial knowledge, and stock market participation exhibited a satisfactory fit to the data. The GFI, TLI, and CFI all exceeded the threshold of 0.90, satisfying the conditions of model fit. Besides, the CMIN/df values were less than between 1 and 3, which is recommended. Moreover, the SRMR was less than 0.08, and the RMSEA was below 0.06.

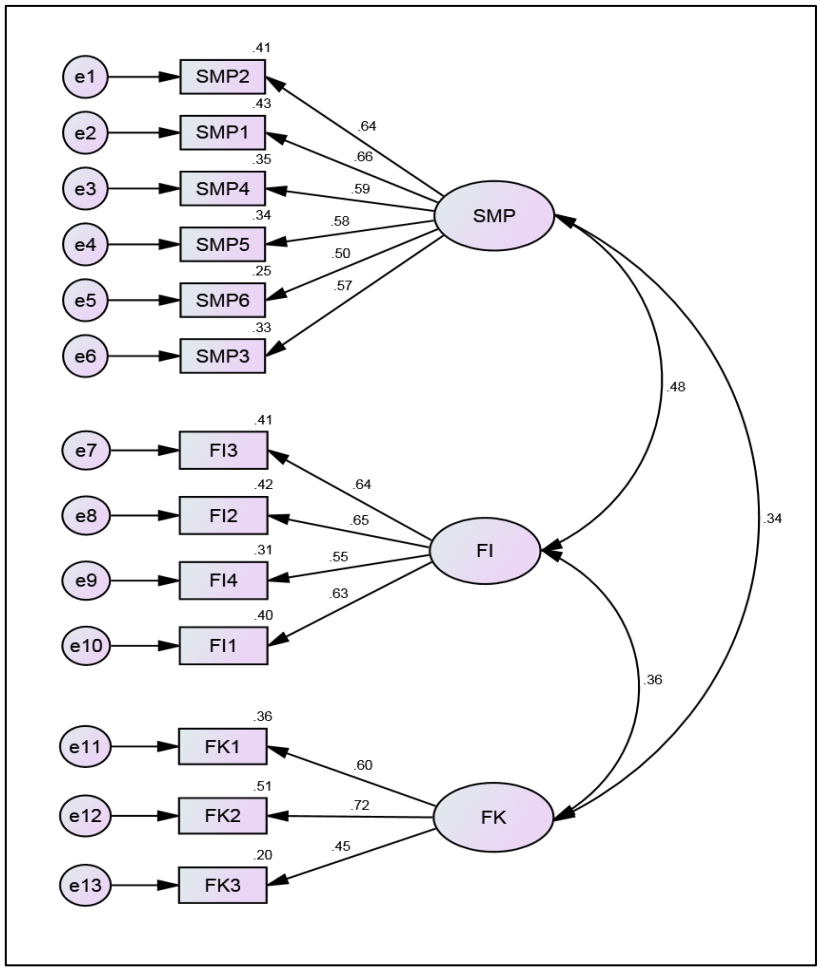

Figure 2. Measurement Model or CFA – Standardised

Source: Authors' Computations from Survey Data, 2024

Figure 2, Results of SEM for a measurement model or confirmatory factor analysis (CFA) showing the relationship of observed variables to latent constructs; double-headed curving arrows indicate correlations among the constructs, thereby interconnecting all latent constructs. Standardized coefficients, commonly shown as arrows or paths, demonstrate the strength and direction of these associations. Factor loadings are essential indicators that measure the strength of the link between observable variables and latent constructs. The residual variances and error terms (e1 to e13) offer valuable information about the unexplained variance in the observed variables. The model assesses its alignment with the data, as seen in Figure 2, with a specific emphasis on measurement. Every construct is evaluated based on three to six indications or observed factors.

3.5 Structural Model

This study tested the hypotheses through SEM. SEM is a multivariate statistical method based on a structural framework representing causal relationships among variables; it goes by the more common name of path analysis. As shown in Figure 3, a structural model was built to test the causal relationships between exogenous and endogenous

variables. Path analysis was done and interpreted in the diagram using Amos software. The proposed model was used for hypothesis testing, primarily direct effects.

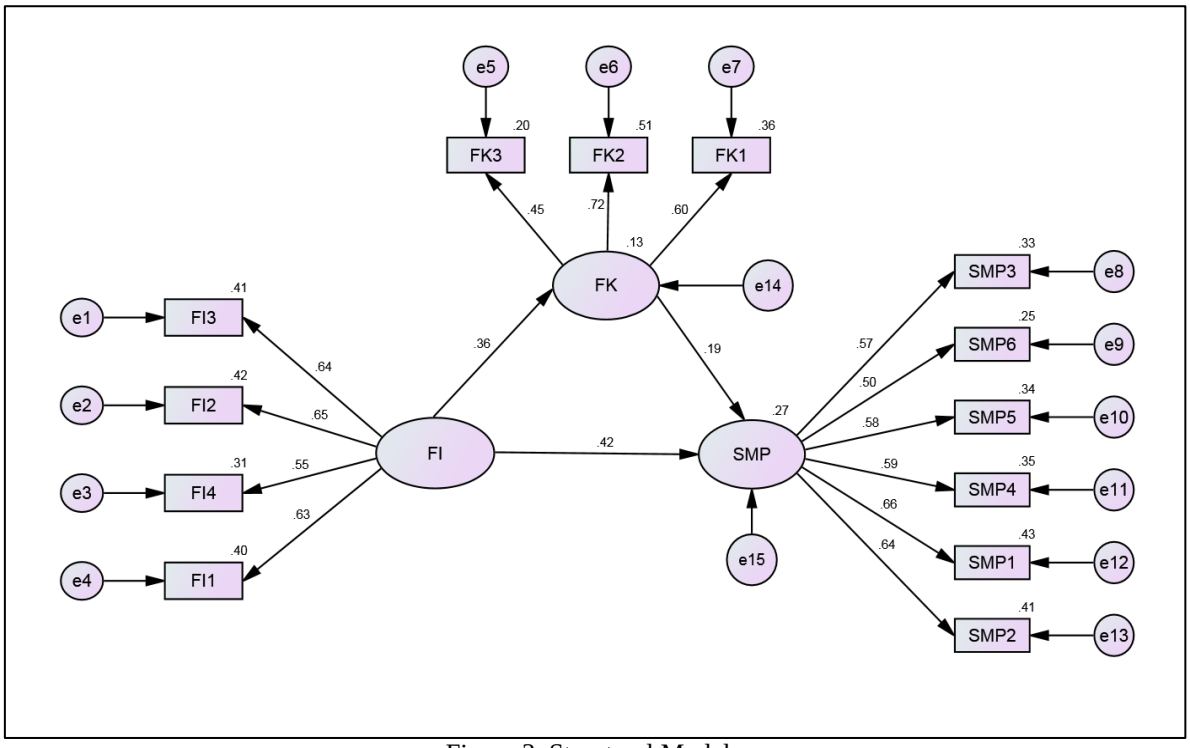

Figure 3. Structural Model

An AMOS software was utilized to construct a structural model to assess relationships. Model fit was deemed satisfactory if the CMIN/df, GFI, TLI, and CFI values were ≥ 0.90 (Hair et al., 2010; Bentler, 1990). Additionally, an acceptable fit was indicated by a standardized root mean square residual (RMR) calculated by AMOS of < 0.05 and an RMSEA between 0.05 and 0.08 (Hair et al., 2010). The model fit indices in Table 6 met these criteria: CMIN/df = 1.843, GFI = 0.958, TLI = 0.934, CFI = 0.948, SRMR = 0.053, and RMSEA = 0.046.

Table 7. Path Analysis

Hypothesized paths			Path Coefficient	Estimate	S.E.	C.R.	P-value	Decision
FI	--->	SMP	.415	.435	.085	5.121	***	Supported
FK	--->	SMP	.189	.194	.078	2.473	.013	Supported
FI	--->	FK	.364	.372	.086	4.338	***	Supported

Source: Authors' Computations from Survey Data, 2024
*Note(s): The symbol "***" indicates statistical significance at the 0.01 level*

On the other hand, the results of SEM hypothesis testing are indicated in Table 7, wherein the hypothesized relationships of the variables and estimated coefficients, standard error, critical ratio, and p-values are indicated. The results show that FI significantly affects individual investor participation in the stock market; therefore, it accepts hypothesis 1. This result also aligned with [6], [27], [28], [41]. The researchers also discovered that FK positively and significantly affected SMP, thus supporting hypothesis 2. In this respect, the

result is in line with [21], [23], [26]. Furthermore, the results showed that FI significantly influences SMP, validating hypothesis 3, a conclusion in agreement with studies by [22], [29].

Table 8. Result of Mediation Analysis

Relationship	Direct Effect	Indirect Effect	Confidence Interval		P - Value	Conclusion
			Lower Bound	Upper Bound		
FI--> FK-->SMP	0.435 (0.000)	0.072	0.013	0.166	0.023	Partial mediation

Source: Authors' Computations from Survey Data, 2024

Table 8 presents the mediation analysis results assessing the mediating role of FK in the relationship between FI and SMP. The indirect effect of FI on SMP through the mediating effect of FK was significant (b = 0.072), with a confidence interval not including zero (lower bound = 0.013, upper bound = 0.166), thus supporting hypothesis 4. The result contributes to the already existing body of literature by [23], [30], [31] about the role that FL plays in translating FI into stock market activity.

4. CONCLUSION

The results of the inferential analysis indicate that FI has played a vital role in facilitating the participation of individual investors in the stock market. They also expose the significant and positive effects of FI and financial knowledge on the active engagement of investors in the stock market. The results also indicate that FI has a significant effect on enhancing FK. These findings offer insights into how FI, FL, and stock market involvement interact. It is seen from the mediation analysis that FK partially mediates the relationship between the constructs of FI and stock market participation, hence evidencing a significant indirect effect through enhanced FK. This underlines the importance of promoting FI and FL to increase the participation of individual investors in the stock market on a sustainable basis.

The findings of this study are essential for both policy and practice. They underline the key functions that FI and FL play in active SMP by individual investors. Therefore, policymakers and financial institutions should focus on activities to enhance access to finance and improve FL. Additionally, the findings suggest that boosting financial knowledge is a vital avenue for leveraging the benefits of FI to increase SMP. Future studies in Nepal should explore the role of financial technology (FinTech) in enhancing FI and SMP. Digital banking, mobile payment platforms, and online investment portals could reduce barriers to SMP, especially in rural areas. Social and cultural factors should also shape financial knowledge and attitudes. Longitudinal studies can examine the long-term impact of improved financial behaviour on investment decisions and the moderating effect of behavioral biases. Moreover, future research could examine the moderating effect of behavioural biases, such as overconfidence or risk aversion, on the relationship between FI, FK, and SMP to offer a more significant understanding of investor psychology in Nepal.

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