

From Financial Inclusion to Financial Well-being: Exploring the Role of Financial Behavior and Financial Security Among Informal Workers in Pakistan

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Abstract

Using Partial Least Squares Structural Equation Modeling (PLS-SEM), this paper explores the impact of financial inclusion on financial well-being through financial behavior and how financial security acts as a moderator in the relationship between financial inclusion and financial behavior. Based on data from 409 workers in the informal sector in Toba Tek Singh, Pakistan. We observed that both financial inclusion and financial security directly generate personal financial behaviors, whose consequences increase overall well-being. The data demonstrate that financial security is a positive moderator; it boosts the beneficial effect of financial inclusion on individual behaviors and contributes to the financial well-being of workers. The findings of this study will guide policymakers and professionals in educating informal sector workers to improve their financial well-being.

Key words: Financial inclusion, Financial well-being, Financial behavior, Financial security, Informal sector workers

1. Introduction

In Pakistan, 80.8% of the population works in the informal economy (PBS, 2024). Financial well-being is not merely limited to earning income (CFPB, 2015). It is about being able to utilize the financial services and knowing how to make use of limited financial resources. The issue of financial well-being is increasingly gaining significance in terms of effectiveness of economy of separate individual unit, as financial resources alone are not enough for successful fulfillment of current financial responsibilities, coping with unforeseen expenses, and accomplish any future goals related to money (CFPB, 2015). Financial well-being is about the capability of managing and controlling finances effectively (CFPB, 2015). Due to this reason, a lot of researchers and practitioners have started focusing on exploring financial conditions and behaviors that help individuals or households to have better financial outcomes (CFPB, 2015). Access and use of financial services is one of the most important aspects of financial inclusion (Demirgüç-Kunt et al., 2021).

The expansion of digital financial services has further increased the potential for financially underserved populations to access and use formal financial services (Demirgüç-Kunt et al., 2022). The Global Findex emphasizes that financial inclusion is not limited to account ownership but also involves how individuals use financial services for payments, saving, borrowing, and managing financial risks (World Bank, 2025; Demirgüç-Kunt et al., 2022).

The relevance of financial inclusion becomes particularly important for low-income and financially vulnerable populations (CFPB, 2015). Individuals with limited financial resources may face greater difficulties in managing unexpected expenses and maintaining financial stability (CFPB, 2015; Huang et al., 2022). Empirical evidence indicates that financial access can be associated with improved financial well-being (Huang et al., 2022; Sakyi-Nyarko et al., 2022). Huang et al. (2022), using a sample of 1,473 low-income families, found that financial access and financial security were associated with financial well-being. Similarly, research conducted in Pakistan by Rashid et al. (2022) reported a positive relationship between financial inclusion and financial well-being among working women in Lahore and found that financial capability mediated this relationship. Research conducted in Ghana has also considered financial inclusion to be a variable contributing to household well-being, demonstrating its wider relevance to economic outcomes for households (Sakyi-Nyarko et al., 2022). However, having access to financial services does not automatically imply the ability of a person to achieve good financial results. The way a person uses money and manages their finances is

also important (CFPB, 2015). Financial behavior describes all the financial activities performed by the person, such as management of finances, budgeting, tracking expenditures, saving, financial planning, and making financial decisions (CFPB, 2015). It is understood using the Theory of Planned Behavior, which states that the behavior is driven by the person's intentions and intentions are influenced by his/ her attitudes, perceptions, and objective perceptions (Ajzen, 1991). Consequently, while financial inclusion provides people with opportunities and means of financial management, it is the financial behavior that influences how a person uses this opportunity in his/her daily life.

This behavioral factor is particularly significant in terms of financial well-being (CFPB, 2015). Regardless of the fact that a person has access to various formal financial services, he or she may still experience difficulties with finances if does not manage his/her income and expenses well. For these reasons, past studies highlight the key role of financial behavior and financial management in explaining financial outcomes (CFPB, 2015; Huang et al., 2022). In this sense, focusing on financial behavior as a mediation variable helps analyze how financial inclusion may lead to financial well-being, rather than treating access to financial services as the only requirement for achieving good financial results.

Moreover, the link between financial inclusion and financial behavior may be determined by an individual's financial context. It is also important to mention the significance of financial stability, as those who are under continuous financial stress lack funds for financial planning (Mullainathan & Shafir, 2013; Mani et al., 2013). Mullainathan and Shafir (2013) state that scarcity shifts the focus to immediate requirements. Consistent with this idea, Mani et al. (2013) show that poverty-related financial challenges affect cognitive functioning. Consequently, one can conclude that financial situation changes how people make use of the possibilities that they have.

The issue becomes even more important given the prevalence of informal labor in Pakistan. Informal workers work without formal contracts, and their income is unpredictable and at the same time they faces the lack of any financial support connected to employment (International Labour Organization, 2018). According to the Labour Force Survey 2024–25 by the Pakistan Bureau of Statistics, informal employment is responsible for most employment opportunities in Pakistan (PBS, 2025). This implies that the presence of informal workers in business is of paramount importance for economic and financial research.

Though the amount of studies on financial capacity and financial conditions continues to grow, there is still a lack of understanding of how financial capacity influences financial conditions among informal workers. Past studies have focused on direct and indirect influences of financial capacity on financial conditions (Huang et al., 2022; Rashid et al., 2022). In this regard, Rashid et al (2022) analyzed the influence of financial capacity as a mediator of the relationship between financial inclusion and financial conditions of female employees in Lahore. However, little research has been performed regarding the financial behavior as a mediator of the influence of financial capacity on financial conditions of informal workers in Pakistan. In addition, some aspects regarding the conditions under which financial inclusion becomes an influence on correct financial behavior remain unexplored. To fill this gap, this study proposes a conditional process model in which Financial Inclusion (FI) is the independent variable, Financial Behavior (FB) is the mediator, Financial Security (FS) is the first-stage moderator, and Financial Well-Being (FWB) is the dependent variable. The model posits that the effect of financial inclusion on financial well-being is partly mediated through financial behavior. At the same time, the strength of the relationship between financial inclusion and financial behavior is assumed to depend on financial security. Thus, the study aims to integrate mediation and moderation in order to assess if the indirect effect of financial inclusion on financial well-being through financial behavior varies at different levels of financial security.

The present study contributes to the existing body of literature on financial inclusion and financial well-being in three important ways. First, it extends the existing literature on financial inclusion and financial well-being as it uses financial behavior as a mediator rather than just examining the direct effect of financial inclusion on financial well-being. Second, it considers financial security as a first-stage moderator that allows it to analyze whether financial circumstances foster the development of financial behavior after gaining access. Secondly, it incorporates the concept of financial security as a moderator at the first stage, which will allow for exploration of the relationship between financial aid and effective financial actions. Third, this research studied informal sector workers in Pakistan specifically, this specific demographic group as a part of employees in Pakistan, and how their financial situation differs from that of other people employed formally.

Thus, the study aims to answer the following questions:

- RQ1: Is there any significant impact of Financial Inclusion on Financial Well-Being of informal workers in Pakistan? RQ2: How does Financial Behavior act as a mediator in

establishing the relationship between Financial Inclusion and Financial Well-Being?

- RQ3: How does Financial Security play a significant role in moderating the connection between Financial Inclusion and Financial Behavior?
- RQ4: How does Financial Security influence the indirect impact of Financial Inclusion on Financial Well-Being via Financial Behavior?

The literature review provides the framework for our study and highlights the important aspects of how financial inclusion affects the financial well-being of informal workers in Pakistan and clearly expresses possible limitations and potentialities for further studies.

2. Literature Review

2.1 Financial Inclusion and Financial Well-Being

Financial inclusion is defined as the accessibility, availability, and use of suitable formal financial services such as savings accounts, transaction accounts, credit, and other financial services (Demirgüç-Kunt et al., 2022). In general, access to such financial services increases the options for people to manage their personal income, perform financial transactions, save, and meet their financial needs (Demirgüç-Kunt et al., 2022). Access to appropriate financial services is of special importance for people with limited financial resources because formal financial services can help them overcome short-term financial challenges (Huang et al., 2022).

Many past studies have shown a positive correlation between financial access and financial well-being. Huang et al. (2022) used data from 1473 low-income families in the U.S. and indicated that evidence was found for the positive relationship between financial access and financial composition. Additionally, they proved that financial access together with financial skills has a positive impact on financial results (Huang et al., 2022). Similarly, Rashid et al. (2022) investigated the case of working women of Lahore, Pakistan and found evidence of financial inclusion's effect on financial well-being (Rashid et al., 2022). Financial inclusion means that people are able to access formal financial services. Access to formal services means a person is more likely to save, transact, get credit, and manage financial disturbances (Demirgüç-Kunt et al., 2022). This provides people more control over their finances and a better sense of financial well-being (Huang et al., 2022). This is especially the case for informal workers whose sources of income may not be stable enough to ensure access to formal financial systems (International Labour Organization, 2018).

Based on the empirical evidence about financial inclusion and financial well-being, the following hypothesis has been developed:

H1: Financial Inclusion (FI) has a significant positive effect on Financial Well-Being (FWB) among informal workers in Pakistan.

2.2 Financial Inclusion and Financial Behavior

Financial inclusion gives access to financial services that help people conduct their finances (Demirgüç-Kunt et al., 2022). However, financial inclusion is different from financial behaviors in the sense that the first just means access to financial services without controlling how people handle their finances. The connection between access to finance and behavior in finance is concerned with the increase in the number of possibilities of financial services. People who are able to use formal bank accounts or financial services can access more chances for saving, receiving payments, executing payments, or managing finances in a formal way (Demirgüç-Kunt et al., 2022). On the other hand, limited access leads to reduced choices available for using financial management.

The relevance of access to finance is supported by empirical research. Research carried out by Demirgüç-Kunt et al. (2022) indicates large discrepancies in the ownership of financial accounts, saving and borrowing, and digital payments among groups of people with different levels of access to formal financial services. According to the research by Rashid et al. (2022), financial inclusion correlates with the financial capabilities of women in Pakistan. Thus, access to formal financial services can provide an environment in which people can implement financial practices correctly (Rashid et al., 2022).

In the case of informal workers, the relationship between access to finance and financial behavior can be important since lack of access to formal banks may mean limited opportunities for saving, paying, and managing money (International Labour Organization, 2018; Demirgüç-Kunt et al., 2022). A higher level of access is likely to mean more positive financial behavior (Demirgüç-Kunt et al., 2022).

H2a: Financial Inclusion (FI) has a significant positive effect on Financial Behavior (FB) among informal workers in Pakistan.

2.3 Financial Behavior and Financial Well-Being

The concept of financial behavior refers to the behavior of individuals in managing their finances. The practices involve budgeting, controlling expenses, saving, tracking financial behavior, and making informed decisions (Xiao et al., 2014). Unlike financial resources, financial behavior shows individuals' intended use of the resources they manage. The relationship between financial behavior and financial well-being is backed by some studies indicating the importance of correct financial practices. For example, Xiao et al. (2014) states that financial capacity and financial knowledge have an impact on financial behavior and thus underline the importance of behavioral financial practices. Additionally, new findings establish the relationship between financial behavior and financial well-being: according to Sabri et al. (2023), there is a clear connection between financial behavior and the financial wellness of young people (Sabri et al., 2023). By means of constructive financial behavior, something positive can be achieved related to financial well-being. Regular savings will provide for better coping with unpredicted expenses, while budgeting and checking expenses enable people to manage resources more successfully. Just like this, making wise financial choices could help lessen avoidable stress, as well as encourage finishing up financial management in the long term (Xiao et al., 2014; Sabri et al., 2023). With informal workers having fluctuating incomes and not much ability to take on sudden heavy financial shocks, these approaches have more meaning there. Thus, those people who make more consistent use of successful financial practices should be able to experience better financial well-being in addition (Sabri et al., 2023). Following this line of argumentation, the next hypothesis is put forward

H2b: Financial Behavior (FB) has a significant positive effect on Financial Well-Being (FWB) among informal workers in Pakistan.

2.4 The Mediating Role of Financial Behavior

The arguments above highlight two different relations: financial inclusion can be expected to impact financial behavior, while financial behavior can influence financial well-being (Demirgüç-Kunt et al., 2022; Sabri et al., 2023). Therefore, the two relationships help to make conclusions about whether financial behavior serves as a mediator between financial inclusion and financial well-being. Moreover, just because access is gained to formal financial services does not mean that financial outcomes will be positive. In fact, benefits from financial inclusion can depend on how people use the possible financial services at their disposal (Huang et al.,

2022). Financial inclusion provides access to services such as accounts, payment systems, and savings services and relates to financial behavior, which describes the processes of using financial services accordingly (Demirgüç-Kunt et al., 2022). From this perspective, it can be concluded that financial behavior is an important tool for transforming financial inclusion into financial well-being. The existence of the behavioral tool is proven by empirical findings. For instance, Rashid et al. (2022) prove that financial capability can play a mediating role in the relationship between financial inclusion and financial well-being in working women from Lahore. Despite the connection, financial capability and financial behavior are two different concepts; the results serve as grounds for examining financial management mediation between financial inclusion and financial well-being. Thus, the study suggests that financial inclusion may lead to financial well-being since greater financial access constructs opportunities for individuals to engage in financial practices, which may improve their financial well-being (Huang et al., 2022; Demirgüç-Kunt et al., 2022).

H2: Financial Behavior (FB) significantly mediates the relationship between Financial Inclusion (FI) and Financial Well-Being (FWB) among informal workers in Pakistan.

2.5 The Moderating Role of Financial Security in the FI → FB Relationship

Financial inclusion can open the door to people to perform financial activities, but there can be a difference in terms of people's ability to act on such opportunities due to their financial status. Financial security is the concept that refers to the feeling of one's ability to satisfy one's financial needs and achieve financial stability. People who experience good financial security can probably afford to conduct some planned financial activities, whereas people with greater financial burdens must prioritize satisfying pressing financial needs (Mullainathan & Shafir, 2013; Mani et al., 2013).

This line of thought goes well with the scarcity perspective put forward by Mullainathan and Shafir (2013). According to them, constant shortages drive the individual's attention to meeting immediate requirements and lessen cognitive resources available for other issues. Mani et al. (2013) provided proof of the fact that financial problems that accompany poverty influence cognitive performance. About financial behavior, people who do not have enough financial security may be forced to spend a bigger share of their available money for immediate needs and obligations. As a result, while still having access to formal financial institutions, these individuals may not be able to use forward-looking methods such as planning and budgeting

systematically (Mullainathan & Shafir, 2013; Mani et al., 2013). On the other hand, people with higher financial stability have a stronger ability to use financial institutions for intelligent and constructive financial purposes.

Thus, financial security might influence the way financial inclusion is linked to financial behavior. Specifically, the positive impact of financial inclusion on financial behavior is anticipated to be more significant in relation to financially secure individuals.

H3: Financial Security (FS) significantly moderates the relationship between Financial Inclusion (FI) and Financial Behavior (FB), such that the positive relationship is stronger at higher levels of Financial Security.

2.6 Conditional Indirect Effect: Moderated Mediation

The previous parts suggest that the concept of financial inclusion is related to financial behavior and that it is also associated with financial well-being (Demirgüç-Kunt et al., 2022; Huang et al., 2022). They also indicate that financial security affects the links between financial inclusion and financial behavior. All in all, these relationships create a foundation for analysis of moderated mediation. Since financial security is seen as a moderator in the first phase of mediation, the indirect impact of financial inclusion on financial well-being via financial behavior is expected to change at different stages of financial security. When financial security is high, people will be able to translate their access to formal financial services into financial behavior. On the other hand, this would not be possible with low financial security, where the pressure for money would hinder the transformation of financial inclusion into behavior (Mullainathan & Shafir, 2013; Mani et al., 2013). Therefore, it is impossible to expect the indirect relationship of financial inclusion and financial well-being through financial behavior to be the same for everybody. On the contrary, it is expected to depend on the level of financial security.

Accordingly, the following hypothesis is proposed:

H4: Financial Security (FS) moderates the indirect effect of Financial Inclusion (FI) on Financial Well-Being (FWB) through Financial Behavior (FB), such that the indirect effect is stronger at higher levels of Financial Security.

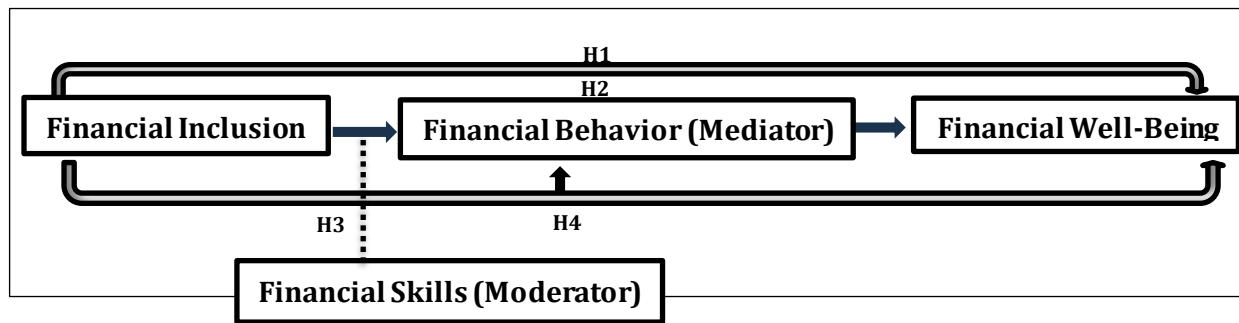


Figure 1: conditional indirect effect

3. Research Methodology

3.1 Research Model

The framework of the study is depicted in Figure 2. The model investigates how FI affects FWB using FB as the intervening variable and FS as a moderating factor. In other words, FI influences the level of FWB using FB, while FS in turn modulates the FI-FB relationship.

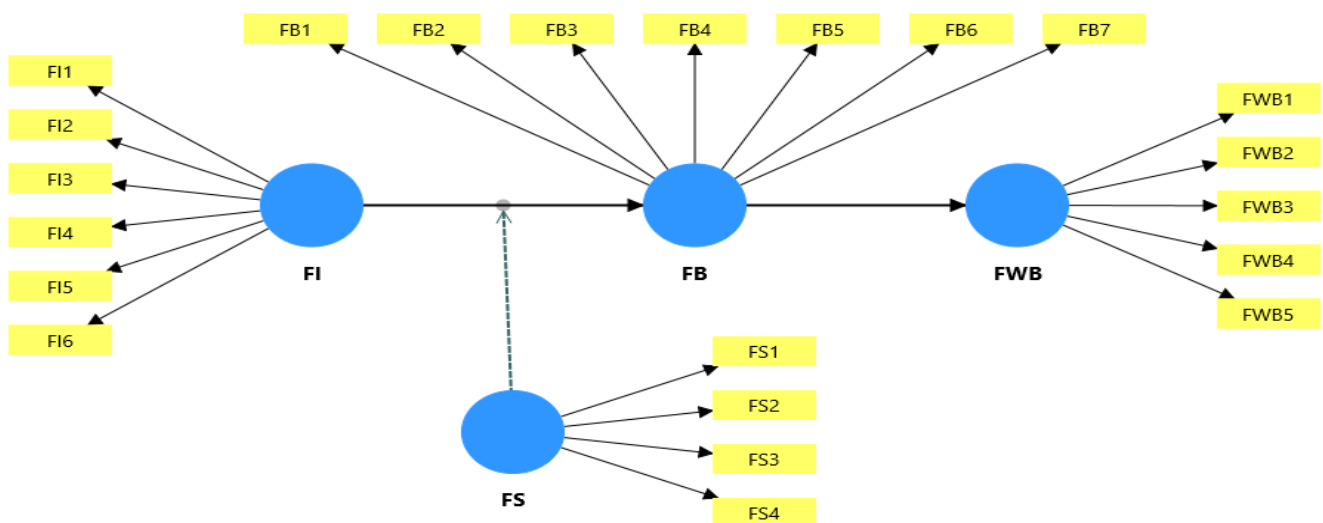


Figure 2: Structural Model

3.2 Measurement of Constructs

The primary data from the informal workers of Pakistan were collected utilizing a structured face-to-face survey. The questionnaire contained the four principal constructs, which were Financial Inclusion (FI), Financial Behavior (FB), Financial Security (FS), and Financial Well-Being (FWB). Financial Inclusion was measured using six items; Financial Behavior was measured using seven items; Financial Security was measured using four items and Financial

Well-Being was measured using five items. This sums the total number of measurement items to 22. All constructs were measured using multiple items on a 5-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The measurement items were adapted from previous studies that were relevant to the constructs (Dillman et al., 2014; Hair et al., 2022).

Table 1: Presents the constructs, measurement items, and main references used for the operationalization of the study variables

Constructs	Items	Label	Related Literature / Source
Demographic information	Gender, age, marital status, level of education, occupation, monthly income, household size, residential area, and bank account ownership.	Nominal scale	
Financial Inclusion (FI)	I can easily obtain the formal financial products and services necessary to me.	FI1	Demirgüç-Kunt et al. (2018); Khan et al. (2022); Rahim et al. (2024)
	The formal financial services offered to me are good enough to fulfil my financial requirements.	FI2	Demirgüç-Kunt et al. (2018); Nandru et al. (2021)
	Having a savings or current account has made it easier for me to manage my finances.	FI3	Demirgüç-Kunt et al. (2018); Tulcanaza-Prieto et al. (2025)
	Being able to get access to formal financial services has made it easy for me to conduct transactions.	FI4	Demirgüç-Kunt et al. (2018); Rahim et al. (2024)
	I have access to many formal financial services and can use them whenever I would like to.	FI5	Khan et al. (2022); Nandru et al. (2021)
	Access to various financial services helps me manage my finances and reduce risks.	FI6	Nandru et al. (2021); Rahim et al. (2024)
Financial Behavior (FB)	Before purchasing anything, I always think whether I can afford it	FB1	Dew & Xiao (2011)
	I pay my bills on time.	FB2	Dew & Xiao (2011)
	I monitor my income and expenses.	FB3	Dew & Xiao (2011)
	I set financial goals and try to achieve them.	FB4	Dew & Xiao (2011)
	I compare prices before buying something.	FB5	Dew & Xiao (2011)
	Before using a financial service, I always pay attention to its price or interest rate.	FB6	Dew & Xiao (2011)
	I regularly save money for future needs or ambitions.	FB7	Dew & Xiao (2011)
Financial Well-Being (FWB)	I can deal with unexpectedly big expenses.	FWB1	CFPB Financial Well-Being Scale
	I am taking steps towards a secure financial future.	FWB2	CFPB Financial Well-Being Scale
	Due to my financial status, I feel that I may never get the things I want from life.	FWB3	CFPB Financial Well-Being Scale
	I can enjoy life due to my good financial management.	FWB4	CFPB Financial Well-Being Scale

	My finances are just okay, but nothing more.	FWB5	CFPB Financial Well-Being Scale
Financial Security	I have sufficient money to cover the regular expenses.	FS1	Munyon et al. (2020); Porter & Garman (1992)
	My finances are stable enough to fulfill my financial obligations	FS2	Munyon et al. (2020); Lawrence et al. (2013)
	I am confident that I have enough money to cover emergencies	FS3	Munyon et al. (2020); financial preparedness literature
	My finances are good enough to cover unexpected expenses.	FS4	Munyon et al. (2020); Hayes & Finney (2013)

3.3 Sampling and Analysis

Data were gathered from informal laborers in Toba Tek Singh, Pakistan, who were participating in informal economic activity, which included daily labor work, vendors, residential work, and home care labor. The study's subjects responded to a structured survey using a self-administered form. The survey was created in Urdu to ease comprehension by the subjects and ensure accuracy in their responses. Data were collected through personal interaction with the subjects in the area of interest. The technique of convenience sampling was chosen because the population of interest consisted of informal laborers who cannot easily be identified through the sampling frame. Only those respondents who were involved in informal worker and voluntarily agreed to participate in the research were included in the sample. In total, 409 questionnaires were sought in the study. The collected responses were screened, and questionnaires characterized with incomplete and inconsistent responses were excluded from analysis. The final data set was used for further statistical analyses. The survey contained metrics on Financial Inclusion (FI), Financial Behavior (FB), Financial Security (FS), and Financial Well-Being (FWB). The respondents rated different constructs using a five-point Likert scale ranging from strongly disagree to strongly agree. Each construct was gauged using a five-point Likert scale, which extended from strongly disagree to strongly agree. The analysis primarily involves investigating the direct relationship of financial inclusion with financial well-being alongside the mediating effect of financial behavior and the moderating effect of financial security.

Information collected was evaluated through SmartPLS 4. The Partial Least Squares Structural Equation Modeling (PLS-SEM) technique was used because the study involves a structural model in which direct relationships, mediation, and moderation among the latent constructs are

being analyzed (Hair et al., 2022; Sarstedt et al., 2022). This analysis involved two stages. The first stage aimed at verifying the measurement model through the reliability and validity of the constructs by evaluating those aspects such as indicator outer loadings, Cronbach's alpha, rho A, composite reliability (CR), and average variance extracted (AVE) (Hair et al., 2022). The measure of discriminant validity utilized was the heterotrait-monotrait (HTMT) ratio (Henseler et al., 2015).

The collinearity was also evaluated through the variance inflation factor (VIF) measure (Hair et al., 2022). In the second place, the evaluation of the structural model was done to confirm the proposed assumptions. The coefficient of determination (R^2) was analyzed to evaluate the explanatory strength of the endogenous variables, while effect size (f^2) was used to evaluate how much benefit each individual predictor has provided (Hair et al., 2022). Bootstrapping with resampling was used to show the significance of the proposed connections (Hair et al., 2022; Sarstedt et al., 2022). The structural model not only included the direct effect of Financial Inclusion and Financial Behavior but also Financial Behavior and Financial Well-Being, Financial Security and Financial Behavior, and their interaction effect of Financial Security and Financial Inclusion on Financial Behavior. The mediation and moderation effects were evaluated according to their corresponding indirect and interaction effects and the bootstrapped confidence intervals (Hair et al., 2022; Sarstedt et al., 2022).

The sample adequacy was checked with respect to PLS-SEM methodology and the complexity of the structural model. The final sample size was deemed appropriate for estimating relationships and conducting measurements of the structural model. Moreover, data screening was conducted before the main data analysis to reveal incomplete, inconsistent, or otherwise inappropriate responses.

To reduce the risk of common method bias, the participants were made aware that their participation was voluntary and that answers would be treated confidentially. The questionnaire was composed of using straightforward and clear statements, and the respondents were urged to respond based on their actual financial experiences. During the initial phase of data screening, issues with missing answers or unnecessary answers were taken care of by removing unacceptable observations from the data. The purpose of these procedures was to enhance the quality and consistency of the outcome.

4. Empirical Results

4.1 Demographic Analysis

The 409 respondents are presented in Table 2. There were 62.8% males and 37.2% females in the sample. The majority of respondents were aged 40–49 years (38.1%), followed by those aged 29–39 years (28.1%). In terms of education, the highest proportion of respondents had secondary education (35.0%), followed by primary education (24.0%). Laborers were the largest occupational group (25.2%), while 41.6% of respondents reported monthly incomes of PKR 10,001–20,000. Most respondents belonged to households with four or more members (33.0%), were married (49.9%), and lived in rural areas (55.7%). Additionally, 76.0% reported having a bank account, while 24.0% did not. Overall, the respondents represented diverse demographic and economic backgrounds.

Table 2: Socio-demographic characteristics

Variable	Category	Frequency	Percentage (%)
Gender	Male	257	63
	Female	152	37
Education	Primary	98	24
	Secondary	143	35
	Intermediate	82	20
	Undergraduate	13	3.2
	Uneducated	73	17.8
Age Group	18–28	60	14.7
	29–39	115	28.1
	40–49	156	38.1
	Above 49	78	19.1
Occupation	Vendor	85	20.8
	Laborer	103	25.2
	Domestic worker	85	20.8
	Home-based worker	75	18.3
	Other	61	14.9
Income (PKR)	<10,000	94	23
	10,001–20,000	170	41.6
	20,001–30,000	111	27.1
	>30,000	34	8.3
Household Size	1	39	9.5
	2	93	22.7
	3	142	34.7
	4+	135	33
Marital Status	Single	75	18.3
	Married	204	49.9

	Widow	94	23
	Divorced	36	8.8
Residential Area	Urban	181	44.3
	Rural	228	55.7
Bank Account	Yes	311	76
	No	98	24

4.2 Measurement Model Assessment

The measurement model was assessed in terms of indicator reliability, internal consistency reliability, and convergent validity. All outer loadings ranged from 0.877 to 0.918, exceeding the recommended threshold of 0.70 (Hair et al., 2022). Cronbach's alpha values ranged from 0.918 to 0.956, while rho_A values ranged from 0.932 to 0.956. Composite reliability (rho_C) values ranged from 0.941 to 0.963, exceeding the recommended threshold of 0.70 (Hair et al., 2019; Hair et al., 2022). Furthermore, the average variance extracted (AVE) values ranged from 0.788 to 0.801, exceeding the recommended minimum threshold of 0.50. These results indicate that each construct explains more than half of the variance in its indicators, supporting convergent validity (Fornell & Larcker, 1981; Hair et al., 2022). Overall, the measurement model demonstrated satisfactory indicator reliability, internal consistency reliability, and convergent validity, providing a basis for proceeding to structural model assessment.

Table 3: Indicator Reliability, Internal Consistency and Outer Loading

Construct	Items	Loading Range	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
FI	FI1–FI6	0.877–0.892	0.956	0.956	0.963	0.79
FB	FB1–FB7	0.879–0.893	0.946	0.948	0.957	0.788
FS	FS1–FS4	0.877–0.918	0.918	0.932	0.941	0.801
FWB	FWB1–FWB5	0.882–0.896	0.935	0.936	0.951	0.794

4.2.1 Discriminant Validity

In doing this, discriminant validity was assessed basing on the Fornell-Larcker method (Fornell & Larcker, 1981); if the square roots of the values of AVE obtained from our data with the values of financial behavior, financial inclusion, financial security, and financial well-being equaled 0,888, 0,889, 0,895, and 0,891, respectively, so we can say that the square roots of the results of AVE significantly overcame the corresponding values of their correlation with the other constructs. It means that our derived values share greater variance with their own

indicators than with the other concepts, thus proving their discriminant validity (Fornell & Larcker, 1981).

Table 4: Discriminant Validity Assessment and Correlation

Construct	FB	FI	FS	FWB
FB	0.888			
FI	0.425	0.889		
FS	0.307	0.102	0.895	
FWB	0.684	0.299	0.266	0.891

4.2.2 Assessment of Collinearity

Collinearity at the level of indicators was evaluated through the factor of variance inflation (VIF). The VIF ranged from 2.800 to 3.717 for indicator measures as a whole, as well as 3.423 to 3.717 for Financial Behavior, 3.096 to 3.573 for Financial Inclusion, 2.800 to 3.234 for Financial Security, and 3.052 to 3.275 for Financial Well-Being. No indicator attained level of VIF higher than conservative level of 5.00 indicated lack of critical collinearity (Hair et al., 2019; Hair et al., 2022). Therefore, the indicators were included in the analysis.

Table 5: Multicollinearity/Variance Inflation Factor

Construct	Indicators	VIF Range
Financial Behavior (FB)	FB1–FB7	3.423–3.717
Financial Inclusion (FI)	FI1–FI6	3.096–3.573
Financial Security (FS)	FS1–FS4	2.800–3.234
Financial Well-Being (FWB)	FWB1–FWB5	3.052–3.275

4.3 Structure model

The Structure model was evaluated to assess its capacity to explain relationships, its predictive capabilities, and the magnitude of relationships that exist within the model. Good overall fit was achieved for the model. The R^2 value showed that the proposed variables explained a significant amount of the variance in Financial Behavior and Financial Well-Being. Additionally, the effect size assessment showed that Financial Inclusion, Financial Security, and their interaction contribute suitably to Financial Behavior, and in turn, Financial Behavior importantly affects Financial Well-Being (Hair et al., 2022; Sarstedt et al., 2022).

4.3.1 Assessment of Model Fit

Various criteria, including SRMR, d_ULS, d_G, Chi-square, and NFI were used to assess the model fit. The estimated model yielded an SRMR of 0.034, indicating a satisfactory approximate fit since it is lower than the critical level of 0.08. Also, an NFI of 0.956 indicates a good incremental fit as well. The values for d_ULS and d_G were 0.289 and 0.155 respectively, while the Chi-square value was reported as 368.327. Thus, it can be concluded that the reported indices indicate a satisfactory model fit, thereby confirming that the structural model is adequate (Hair et al. 2019; Hair et al. 2022).

Table 6: Model Fit Values

	Saturated model	Estimated model
SRMR	0.033	0.034
d_ULS	0.27	0.289
d_G	0.171	0.155
Chi-square	416.992	368.327
NFI	0.95	0.956

4.3.2 Coefficient of Determination (R^2)

Evaluated the coefficient of determination in order to determine how well the model explains variance in the response variables. The data demonstrated that the model accounts for 52.8% in Financial Behavior ($R^2 = 0.528$; adjusted $R^2 = 0.525$) and 42.0% in Financial Well-Being ($R^2 = 0.420$; adjusted $R^2 = 0.418$). This shows that the variables incorporated in the model tell us something useful about both dependent variables.

Table 7: R-Square Values

	R-square	R-square adjusted
FB	0.528	0.525

FWB	0.42	0.418
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4.3.3 Effect Size (f^2)

The effect sizes were calculated in order to find out how much of the influence is exerted by certain predictors on the endogenous constructs. Financial inclusion shows a major impact on financial behavior with the f^2 value of 0.356; in contrast, the impact of financial security on financial behavior is medium since its f^2 value is 0.218. Financial behavior produces a considerable effect on financial well-being with an f^2 value of 0.723. The above-mentioned effects are also evident during the analysis of the effect of the interaction term of financial security and financial inclusion on financial behavior, with an f^2 value of 0.634. Cohen (1988) states that 0.02, 0.15, and 0.35 are typically small, medium, and large effects, respectively.

Table 8: Effect Size (f^2)

Effect Size (f^2)	f^2	Effect
FI → FB	0.356	Large
FS → FB	0.218	Medium
FB → FWB	0.723	Large
FS × FI → FB	0.634	Large

4.4 PLS- Bootstrapping for Hypothesis Testing

In order to determine the statistical relevance of the anticipated relationships, Smart PLS used a bootstrapping procedure. Bootstrapping is a non-parametric resampling method that helps determine how reliable and significant the coefficients of the structural path are, without making any assumption regarding the form of the distribution for the data used. The relationships were evaluated with the original coefficient values (β), t-statistics, and p-values obtained via bootstrapping. A one-tailed significance threshold of 1% was used for determining if the relationships were statistically significant, thus relationships with p-values below this threshold were deemed statistically significant.

H1: Financial Inclusion (FI) has a significant positive effect on Financial Well-Being (FWB) among informal workers in Pakistan.

Hypothesis	Relationship	β	t-value	p-value	Previous Studies	Decision
H1	FI $\rightarrow$ FWB	0.33	11.13	< 0.001	Demirgüç-Kunt et al. (2022); Huang et al. (2022)	Supported

Table 9: Hypothesis 1

Results from bootstrapping show that Financial Inclusion has a statistically significant positive effect on Financial Well-Being ($\beta = 0.330$, $t = 11.130$, $p < 0.001$). The positive value of the path coefficient indicates that increased Financial Well-Being comes with higher Financial Inclusion. Similar results have been reported previously in other studies such as Demirgüç-Kunt et al. (2022) and Huang et al. (2022). Thus, the findings of this study support H1.

H2a: Financial Inclusion (FI) has a significant positive effect on Financial Behavior (FB) among informal workers in Pakistan.

Table 10: Hypothesis 2a

Hypothesis	Relationship	β	t-value	p-value	Previous Studies	Decision
H2a	FI $\rightarrow$ FB	0.412	10.564	< 0.001	Xiao et al. (2014); Sabri et al. (2023)	Supported

The findings of bootstrapping suggest that Financial Inclusion positively influences Financial Behavior ($\beta = 0.412$, $t = 10.564$, $p < 0.001$). The positive value of the coefficient indicates that higher Financial Inclusion corresponds to more positive Financial Behavior. This result fits with the findings of previous studies by Xiao et al. (2014) and Sabri et al. (2023), proving the importance of financial availability and financial activities in determining the behavior of people in financial activities. That is why H2a gets support.

H2b: Financial Behavior (FB) has a significant positive effect on Financial Well-Being (FWB) among informal workers in Pakistan.

Table 11: Hypothesis 2b

Hypotheses	Relationship	β	t-value	p-value	Previous Studies	Decision
H2b	FB $\rightarrow$ FWB	0.648	21.813	< 0.001	Xiao et al. (2014); Sabri et al. (2023)	Supported

The results from bootstrapping clearly show that Financial Behavior plays a positive role in improving the Financial Well-Being of people ($\beta = 0.648$, $t = 21.813$, $p < 0.001$). The positive value of the coefficient suggests that those who engage in better financial practices are likely to be in a better position regarding their Financial Well-Being. The findings of the current study are consistent with those of earlier studies conducted by Xiao et al. (2014) and Sabri et al. (2023), where the authors show a significant effect of financial behavior on financial outcomes and financial well-being of people. This leads to the validation and support of the H2b hypothesis.

H3: Financial Security (FS) significantly moderates the relationship between Financial Inclusion (FI) and Financial Behavior (FB), such that the positive relationship is stronger at higher levels of Financial Security.

Table 12: Hypothesis 3

Hypothesis	Interaction Relationship	β	t-value	p-value	Previous Studies	Decision
H3	FS $\times$ FI $\rightarrow$ FB	0.511	15.428	< 0.001	Huang et al. (2022); Sabri et al. (2023)	Supported

The bootstrapping outcomes indicate that the interaction between Financial Security and Financial Inclusion has positive and statistically significant influence on Financial Behavior ($\beta = 0.511$, $t = 15.428$, $p < 0.001$). The positive interaction coefficient signifies that Financial Security enhances positively the connection between Financial Inclusion and Financial Behavior. In other words, the association of Financial Inclusion with Financial Behavior gets stronger with an increase in Financial Security. These conclusions are compatible with other findings offered by Huang et al. (2022) and Sabri et al. (2023) that emphasize the role of financial conditions for financial behavior and financial outcomes. Thus, support for H3 is

given.

H4: Financial Security (FS) moderates the indirect effect of Financial Inclusion (FI) on Financial Well-Being (FWB) through Financial Behavior (FB), such that the indirect effect is stronger at higher levels of Financial Security.

Table 13: Hypothesis 4

Hypothesis	Moderated Indirect Relationship	β	t-value	p-value	Conditional Indirect Effect	Decision
H4	$FI \times FS \rightarrow FB \rightarrow FWB$	0.561	12.918	< 0.001	High FS: $\beta = 0.598$, $p < 0.001$; Mean FS: $\beta = 0.267$, $p < 0.001$; Low FS: $\beta = -0.064$, $p = 0.077$	Supported

The bootstrapping data reveal a considerable moderated indirect influence on Financial Inclusion and Financial Well-Being via Financial Behavior, contingent on Financial Security ($\beta = 0.561$, $t = 12.918$, $p < 0.001$). It suggests that the indirect connection between Financial Inclusion and Financial Well-Being through Financial Behavior depends on the level of Financial Security being investigated. The conditional indirect effects further demonstrate the significance of indirect effect at both high ($\beta = 0.598$, $p < 0.001$) and average ($\beta = 0.267$, $p < 0.001$) levels of financial security being measured. Meanwhile, the indirect impact at low levels of Financial Security is negative and statistically insignificant ($\beta = -0.064$, $p = 0.077$). The aforementioned results imply that Financial Security strengthens the indirect mechanism through which Financial Inclusion affects Financial Well-Being via Financial Behavior. Thus, H4 is verified.

5. Conclusion

It has been determined in the study that there is a link between Financial Inclusion and Financial Well-Being, where Financial Behavior has a role to play in that connection along with the role that Financial Security played in those relationships (Huang et al., 2022; Sabri et al., 2023). The results are quite straightforward as with better Financial Inclusion people tend to be better in terms of Financial Well-Being, but that's more than just access to financial services—it is the way that people are using these services that matters (Demirgüç-Kunt et al., 2022).

Going into more depth, we see that Financial Inclusion is directly related to better Financial Behavior, and better Financial Behavior in turn is directly related to Financial Well-Being (Xiao et al., 2014). The connection from Financial Inclusion to Financial Well-Being goes through Financial Behavior—meaning that Financial Inclusion has an influence on Financial Well-Being through Financial Behavior (Rashid et al., 2022).

However, it's not the end. In addition to all the above-mentioned, we see that Financial Security plays an important role here. The connection between Financial Inclusion and Financial Behavior becomes stronger when it comes to people who feel financially secure (Munyon et al., 2020). The gist of the above is that when people enjoy financial security, they can enjoy the benefits that come from that security (Sakyi-Nyarko et al., 2022). Thus, the study illustrates how financial access, financial habits, and financial security come together to create financial well-being.

6. Recommendations

In light of the research results, some recommendations can be made. Firstly, the desired financial inclusion policies should not only focus on providing certain financial services to the population but also include programs that will teach people how to effectively manage their finances (Consumer Financial Protection Bureau, 2015). Access to different financial means can be more efficient when people receive skills and knowledge regarding how to use them effectively (Xiao et al., 2014).

Secondly, there should be more emphasis on improving financial behavior, as financial behavior significantly mediates the relationship between financial inclusion and financial wellbeing; financial education should have practical behavioral elements such as budgeting, saving, borrowing, spending monitoring, and financial planning (Dew & Xiao, 2011; Sabri et al., 2023).

Finally, banks and other financial institutions should create accessible financial products for vulnerable segments of the population (Demirgüç-Kunt et al., 2022). Simple, affordable, and clear financial products will help people make use of financial services more effectively (Rahim et al., 2024). Policies and programs must take into account Financial Security, which is a crucial contextual factor. The findings demonstrate that the impact of Financial Inclusion on Financial Behavior differs depending on the financial security of an individual (Huang et

al., 2022). Therefore, alongside inclusion programs, measures to enhance the financial resilience of people, for example, promoting precautionary savings, ensuring access to risk management tools, and encouraging rational financial planning (Hayes & Finney, 2013). In addition, financial service providers should increase their outreach both via digital and community channels (Nandru et al., 2021).

Money-making institutions should cooperate with community groups, local development organizations, and stakeholders in order to provide appropriate financial help to people (Khan et al., 2022).

In the end, researchers must investigate these connections in accordance with longitudinal or experimental studies so as to receive more substantive proof of the temporal relations between Financial Inclusion, Financial Behavior, Financial Security, and Financial Well-being (Hair et al., 2022). Further work may also include checking more contextual factors as well as studying various demographics, occupations, and regions to see whether the revealed relations hold for all groups (Pakistan Bureau of Statistics, 2025; Sarstedt et al., 2022).

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