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# Digital Financial Literacy and Its Impact on Financial Decision-Making of Women: Evidence from India

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**Abstract:** Despite the increasing accessibility of digital financial instruments globally, a number of women encounter obstacles in properly using these platforms due to insufficient digital financial literacy, which profoundly affects their financial decision-making and economic empowerment. This study aims to promote digital financial literacy and Fintech adoption for women in India by examining the effects of digital financial literacy on financial decision-making while considering the mediating effect of government support and digital financial literacy. Furthermore, in this study, we analyzed the relationship between independent variables such as financial attitude (FAtt), subjective norms (SNs), perceived behavior control (PBC), digital financial literacy (DFL), and financial accessibility (FA) on the dependent variable, i.e., financial decision-making (FDM). We also explored how financial decision-making impacts women' intention towards investment (INT). By analyzing 385 Indian women respondents using Structural Equation Modeling (SEM), this study revealed that financial attitude (FAtt) leads to higher financial decision-making (FDM), exerting moderate effects. Similarly, subjective norms (SNs), perceived behavioral control (PBC), digital financial literacy (DFL), and financial accessibility (FA) significantly lead to financial decision-making. Overall, the five predictors of financial decision-making explained around 71% of the variance. Financial decision-making exerted a significant and robust effect on women's intention towards investment. Financial resilience significantly moderated the effects of financial decision-making on women's intention towards investment. These findings emphasize the necessity of implementing a distinct government strategy and programs to enhance the adoption of Fintech among women living in urban and rural regions across India. This study is aligned with UN Sustainable Development Goals, especially Sustainable Development Goal (SDG) 1: No Poverty, SDG 5: Gender Equality, and SDG 8: Decent Work and Economic Growth.

**Keywords:** digital financial literacy; financial inclusion; women's empowerment; financial decision-making; Saudi Vision 2030; Sustainable Development Goals (SDGs); financial resilience



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## 1. Introduction

In recent years, the world has witnessed significant advancements in technology and digital transformation, revolutionizing various sectors and aspects of our lives. Alongside these developments, there has been a growing recognition of the crucial role played by digital and financial literacy in empowering individuals, particularly women, and achieving the United Nations Sustainable Development Goals (SDGs). Women's empowerment is a multifaceted concept encompassing social, economic, and political aspects, and it plays a pivotal role in achieving sustainable development. It is widely acknowledged that empowering women leads to a cascade of positive outcomes, not only for women

themselves but also for their families, communities, and societies at large. Recognizing this, the SDGs, a global agenda for development adopted by the United Nations, highlight gender equality and women's empowerment as one of the key goals (SDG 5) (Cui et al. 2017; Beloskar et al. 2024; Tanzile et al. 2023).

Digital and financial literacy, on the other hand, are critical components in enabling women to participate fully in the modern digital economy and economic systems. Digital literacy, in simple terms, refers to the ability to access, understand, and utilize digital technologies effectively. On the other hand, financial literacy describes the skills and information needed to handle finances, manage resources, and operate within financial systems (Lusardi 2019; OECD 2023). The percentage of women in the world's population is around 49.58%. India was expected to have 1.4 billion people living there in 2021, a 0.97% increase from 1.38 billion in 2020. India is ranked 112th in terms of population growth rate and 2nd in terms of population in the world. In India, there were 108.15 men for every 100 females in 2021. In India, there are 669.44 million women and 723.97 million men. The percentage of females in the population is 48.04%, while the percentage of males is 51.96%. In India, there are 54.54 million more men than women. India ranks 189th out of 201 nations or territories in the world in terms of the ratio of women to men (Statisticstimes 2021). According to the National Family Health Survey (NFHS-5) for 2020–2021, India's Sex Ratio in 2023 was 1020 females per 1000 males, which is improved by 12 points. The total labor force in India was reported at 507,704,840 in 2021, which increased to 593,729,164 in 2023, according to the World Bank collection of development indicators. India's female labor force participation rate saw no significant changes in 2021 compared to 2020 and remained at around 22.99% (Klapper and Miller 2021; PIB 2021).

The latest results of the Periodic Labor Force survey (PLFS), released by the Labor Bureau in October 2023, showed a considerable increase in women's participation. In 2017–2018, the participation rate was 23.3%, and in 2022–2023, it was 37%. In India, the labor force participation rate among females is 32.7%, and among males, it is 76.8% for 2023. Currently, the employment gap between men and women is about 58%. At the moment, there is about a 58% employment disparity between men and women. Furthermore, reducing that difference may increase India's GDP by about a third by 2050, according to Bloomberg Economics research. However, ignoring the problem could impede the nation's efforts to develop into a competitive manufacturer for international markets (Mazumdar and Chaudhary 2022).

According to Duflo (2012), financial inclusion, literacy, and female employment engagement are contributing aspects to the nation's development and advancement in the global context. Consequently, women are now contributing to the financial decision-making process, which leads to quicker, healthier financial well-being (Haque and Zulfiqar 2016). Well-being is every individual's desire. The element of financial well-being holds more importance than physical, community, social, and career aspects (Rath and Harter 2010). In Southeast Asia, financial services play a significant role in the digital economy and can promote financial inclusion (Son et al. 2019). Women have more opportunities to engage in society and the economy when they use Fintech, a cutting-edge mobile payment platform, particularly in areas such as investment, entrepreneurship, and money management.

Women are empowered by Fintech because it expands their economic prospects and improves their financial literacy. Additionally, it increases their accessibility to financial services. By offering solutions suited to their needs and challenges, Fintech adoption also encourages women's originality and resourcefulness (Babar 2023). As a result, promoting women's adoption of Fintech can aid in sustained and equitable economic growth and boost productivity and monetary stability (Adera and Abdisa 2023; Sharma and Changkakati 2022). This study provides useful information to both Fintech service providers and policymakers by addressing the gender gap in Fintech adoption. A previous survey found that just 21% of women and 29% of men use Fintech, indicating a significant and pervasive gender gap in this area. The gender gap in financial services access is a pervasive issue in many countries, as evidenced by the data showing significant discrep-

ancies in Fintech usage between men and women (Chen and Guo 2023; Chen et al. 2023b). Since having access to Fintech is a prerequisite for financial inclusion, closing this gap is crucial for the empowerment of women (Sherwani et al. 2023; Sundarasen et al. 2023; Yathiraju and Dash 2023; Setiawan et al. 2024). Additionally, improving financial awareness and education among women might further drive their demand for financial services (Morsy 2020).

### 1.1. Financial Decision-Making

Financial decision-making refers to selecting the best course of action for the person (in the short and longer term) while considering current financial and economic realities. Essential considerations include balancing the need to grow in the longer term (through astute and careful investments, mindful of potential risks involved) (Skill Maker 2018). In order to obtain financial goals, financial decision-making entails choosing, evaluating, and analyzing various choices for data extraction and utilization. The entire process is centered on analyzing financial data using risk and return trade-offs and then carrying out executive decisions in accordance with long-term goals. It has been a complex process that includes a range of tasks such as setting financial objectives, obtaining financial data, analyzing possibilities, determining alternatives, weighing risks and benefits, coming to judgments, and more.

Over the past decade, the discrepancies in financial planning and diminishing savings have garnered significant attention towards FDM (Brüggen et al. 2017). It is based on the premise that individuals possess the liberty to choose from an extensive array of financial alternatives that ensure wealth optimization. The prospect hypothesis originates from the concept proposed by Kahneman and Tversky (1979), which advocates for conducting a cost–benefit analysis (CBA) of available options, favoring those with minimal negative financial repercussions and a satisfactory degree of assurance in achieving success. Theoretical argument underscores the inadequacy of predetermined analytics in facilitating decision-making due to conflicting objectives and contexts associated with those decisions. As FDM is inherently a cognitive process, it exhibits diverse patterns influenced by personality factors (such as risk aversion or reward-seeking), speed, and the extent of autonomy in decision-making.

As a result, in the context of India, this research assumes that FDM is the result of variables such as digital financial literacy (DFL), financial accessibility (F), subjective norms (SN), perceived behavior control (PBC), and financial attitude (Fatt), in addition to a demographic element such as gender (Ali et al. 2024).

### 1.2. Digital Financial Literacy

The relevance of Digital Financial Literacy has expanded due to the development and decentralization of Fintech products and services. People are taking responsibility for their financial planning and becoming more financially independent, which ensures financial autonomy and inclusion. DFL not only improves financial inclusion but also empowers citizens to embrace a cashless economy and warns them against digital fraud, including phishing and hacking (OECD 2023). It also facilitates the efficient use of Fintech products and services (Ozili 2018). Similarly, (Park 2011) argues that familiarity with the technological components of the Internet, awareness of standard institutional norms, and comprehension of current privacy regulations are three distinct dimensions of digital literacy that significantly influence privacy-related online behavior.

### 1.3. Women's Empowerment

The concept of women's empowerment itself is multifaceted and has many definitions and connotations. As per the UNDP Human Development Report (1995), empowerment is defined as the ability of individuals to take part in the process of making decisions that affect their lives. Economic growth and development depend heavily on giving women the authority to make their own decisions and empowering them.

One of the most crucial factors in assessing a person's growth and development is their level of participation in the economy, particularly when considering sustainable development objectives. Everyone must uphold the national priorities of women's empowerment, status advancement, and effective involvement in all spheres of life. In recent years, the global development agenda has placed a greater emphasis on women's financial inclusion. Women's access to finance has been identified by national and international development organizations as a primary objective and element of their development initiatives.

The World Bank established Universal Financial Access (UFA) as a strategic aim in 2013 with the intention of granting access to financial transactions to all adult people worldwide, regardless of gender. A primary goal of the G20's development agenda was to clearly incorporate financial inclusion as a means of empowering women economically in 2015 (World Bank 2021). The importance of women's financial inclusion in achieving sustainable development and pro-poor growth was highlighted by including women's access to finance as a prerequisite to attaining the fifth goal of the United Nations Post-2015 Sustainable Development Goals (SDGs), which are in force until 2030. Giving women access to economic and social opportunities—such as banking services, real estate, employment, and other productive assets—will enable them to advance their rights, take more charge of their lives, and engage in society. Hence, most of the UN state members have reacted to comply with the SDGs. For example, currently, the Kingdom of Saudi Arabia (KSA) has announced in its 2030 Vision a high level of women's empowerment in all forms of social, economic, and political activities (Saudi Vision, Saudi Vision 2030 2016). Such governmental intervention by KSA is seen as a response to the SDGs to implement all policies and regulations related to women's rights. This is known as women's economic empowerment (Ferrant and Thim 2019). The five components of women's empowerment includes: their sense of self-worth, their right to make financial decisions, their right to access opportunities and resources, their right to have the power to control their own lives, both within and outside the home, and their ability to influence the direction of social change to create a more just social and economic order, both nationally and internationally.Education, training, awareness-raising, self-confidence development, expanded choices, increased access to and control over resources, and actions to transform the structures and institutions that perpetuate gender discrimination and inequality are critical tools for empowering women and girls to assert their rights in this context. This is discussed in Figure 1.

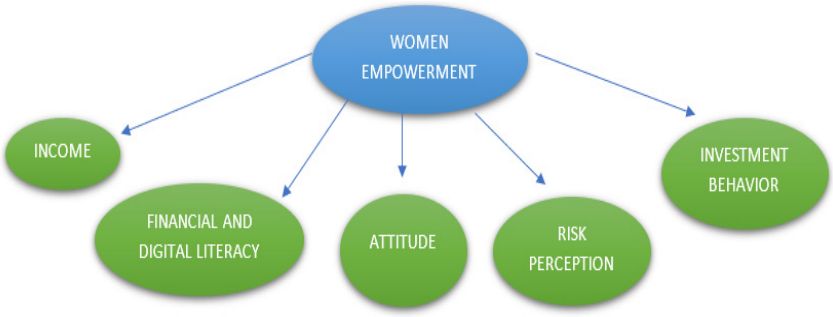


**Figure 1.** Elements of women's empowerment (Hendriks 2019).

Financial inclusion, especially through digital financial services, is recognized to enhance women's income and alleviate poverty, both of which are crucial for women's economic empowerment (Hendriks 2019). Approximately 1.7 billion individuals are reported to be unbanked (Demirguc-Kunt et al. 2018), presenting numerous obstacles to sustainable development. Moreover, women constitute 56% of the unbanked demographic and are disproportionately represented in certain nations, such as China, Bangladesh, and India. The growing popularity of cell phones and the Internet has positioned mobile-enabled financial services as a crucial catalyst for enhanced financial inclusion and the advancement of social development.

### 1.4. Financial Accessibility

The ability of people and businesses to use financial services such as loans, savings, insurance, and payments is referred to as "access to finance", and it has a favorable effect on both financial and economic growth (Guney and Demirel 2019).

### 1.5. Elements of Sustainable Development Goals (SDGs)

The 2030 Agenda for Sustainable Development demands a fresh, ground-breaking perspective. Gender equality is given top importance among 17 UN Sustainable Development Goals that are integrated and indivisible. Goal 5 stands alone, and gender equality is mainstreamed across the SDGs to address women's empowerment and gender equality as stated priorities. The 2030 Agenda acknowledges multifaceted inequalities both within and across nations and is a pledge to "leave no one behind" (United Nations Sustainable Development Group 2019; Mackie and Allwood 2022). This is discussed in Figure 2.

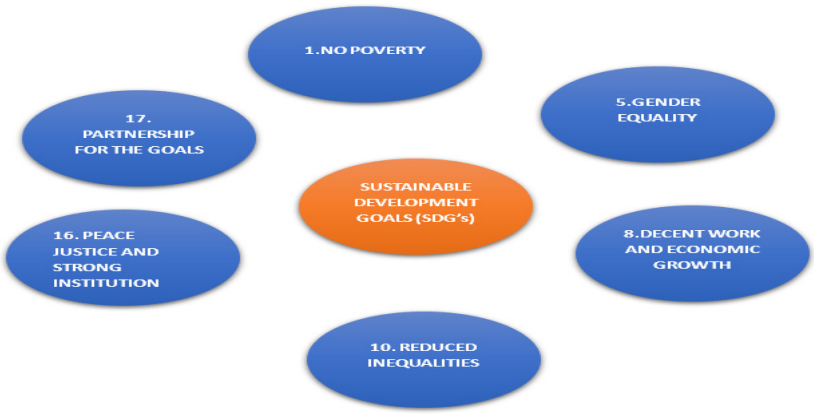


**Figure 2.** Elements of SDGs.

The first thorough assessment of the state of women's empowerment and gender equality in Asia and the Pacific under the Sustainable Development Goals framework was created in a collaboration between the Asian Development Bank (ADB) and the UN Women Regional Office for Asia and the Pacific (Cerise 2018).

### 1.6. Theoretical Underpinning

Individuals in behavioral science and behavioral finance are considered irrational, i.e., they take different financial decisions and act differently in different situations, have limited access to information, and enjoy utility derived from short-term decisions. Their financial decisions can influence individuals' financial well-being with a given level of capability. This study is grounded on behavioral theory, i.e., the Theory of Planned Behavior provided by (Ajzen 1991).

#### Ajzen's (1991) Theory of Planned Behavior

This theory expands on the idea of planned behavior to explain why people choose to act in a certain way when they feel like they have behavioral control (see, for example, Sharahiley 2020). High levels of accuracy can be used to predict intentions to carry out specific actions based on attitudes toward the conduct, subjective norms, and perceived behavioral control. Together, these intentions and perceptions of behavioral control explain a significant portion of the variation in actual behavior. Although the precise nature of these relationships is yet unknown, attitudes, subjective norms, and perceived behavioral controls are related to appropriate sets of salient behavioral, normative, and control beliefs about the activity.

The theory is utilized to identify and derive three distinct groups of factors, which include the following:

**(a) Attitude Influencing financial decision-making**

According to Vargas-Sánchez et al. (2016), attitude is the way a person perceives and assesses something or someone, as well as a predisposition or a tendency to react either favorably or unfavorably to a particular idea, item, person, or circumstance. Rai et al. (2019), discovered strong evidence that financial attitude and financial literacy positively influence financial behavior in their study Improving Financial Decision Making: The Mediating Role of Financial Behavior. While financial literacy (FL) may not have a significant impact on investment decisions (IDs) by itself, studying the relationship between FL and IDs can provide valuable insights into investor behavior. This can be achieved by analyzing how attitude (ATT) and overconfidence bias (OCB) act as mediators in the connection between FL and IDs. The results suggest that foreign language proficiency, when paired with a positive attitude and excessive self-assurance, enables individual investors to possess the necessary knowledge and abilities to make appropriate decisions (Maheshwari et al. 2024; Brooks and Williams 2021; Kumar et al. 2023a).

**(b) Subjective norms/prescriptive influence influencing financial decision-making**

The belief on whether the majority of people accept or disapprove of the behavior is discussed in (Khaw et al. 2023; White et al. 2019). It has to do with a person's ideas regarding whether or not important people and peers believe that he or she should participate in the conduct. Learning practices within the home context were perceived as influential on future behavior in their study of factors that influence financial decisions and effectiveness (Vyvyan et al. 2014).

**(c) Perceived behavioral control influencing financial decision-making**

The term "perceived behavioral control" describes how easy or difficult a person believes a particular behavior to be. A person's behavior is greatly influenced by how confident they are in their capacity to complete a task. Because a range of connections between attitudes, beliefs, intentions, and actions can be explained by self-efficacy (Sharahiley 2020), in this case, perceived financial capability is interpreted as confidence or self-efficacy. Financial self-efficacy is a crucial sign of financial decision-making ability in consumer finance, according to (Xiao et al. 2014). They also discovered that as people age, their perception of financial decision-making rises.

The structure of this paper includes Section 1, which discusses the concept and motivation behind this study. Section 2 discusses the literature review and hypothesis formulation used to conduct this research. Section 3 presents the research methods employed to conduct this research, while Section 4 presents the results from the data analysis. Section 5 presents the conclusion, Section 6 presents the implications, Section 7 presents recommendations and suggestions, and Section 8 presents scope for future work and the limitations of this study.

## 2. Literature Review and Hypothesis Formulation

This literature review aims to critically analyze and synthesize existing research on the relationship between digital financial literacy, financial accessibility, subjective norms, perceived behavior control, and financial attitude on the financial decision-making of women.

A systematic literature search was conducted using academic databases, including Scopus, Science Direct, and Google Scholar. The search terms included "digital and financial literacy", "financial well-being", "financial resilience", "financial decision making", "investment behavior", and "women empowerment". The inclusion criteria involved empirical studies published in peer-reviewed journals between 2014 and 2024, written in English, and focusing on the impact of social media on mental health. The initial search yielded 500 articles, of which 153 met the inclusion criteria. Using the guidelines of (Choong 2014; Matthews and Marzec 2012; Paul et al. 2017; Paul and Rosado-Serrano 2019) in the literature review, the articles have been collected from high-quality and high-impact journals indexed in electronic databases including ScienceDirect, Scopus, Web of Science (WoS), Google Scholar, and ProQuest.

This research work started with searching and reviewing the literature on a broad area of Financial Inclusion and Sustainable Development from 1993 to mid-2024. The keywords used related to the study are sustainable development goals, self-help groups, financial technology, financial literacy, financial exclusion, and the policies related to these by various countries. The search was conducted across the selected databases with the following terms: **'financial inclusion', 'financial exclusion', 'sustainable development', 'Fintech', 'financial capability', 'financial literacy', 'Artificial intelligence', and 'self-help groups'.** The available papers were refined by setting the scope of the review to include empirical studies. Tools such as publication trends and citation network analysis were applied in the present study. Publications related to the theoretical perspective of Financial Inclusion and its other related areas were considered for review work. The articles selected were analyzed and understood thoroughly, considering the topic's relevance. The research also included secondary data sources such as RBI, SLBC, NITI Aayog reports, magazines, newspapers, and information from websites.

### *2.1. Financial Attitude Influencing Financial Decision-Making*

According to earlier studies, Attitude is the inclination of an individual to assess their preferences and aversions in relation to a certain item, activity, person, group, or situation (Ajzen 2011; Sharahiley 2020).

In the context of this study, assessing AT comprises figuring out if an individual has a favorable or negative viewpoint regarding digital financial literacy and using Fintech services, as well as their degree of comfort and interest in the service and their ability to make financial decisions. Several past studies considered AT while deciding whether to employ Fintech services (Nathan et al. 2022; Akinwale and Kyari 2022). Previous research findings have shown a noteworthy association between the adoption of AT and Fintech and financial decision-making. However, a new study has discovered that although Fintech usage and attitudes toward technology are closely related, other factors contribute very little to the total disparity (Chen and Guo 2023; Chen et al. 2023a). Diverse psychological, behavioral, and demographic aspects influence financial decision-making, promoting the creation of a viable and profitable financial portfolio to secure the long-term financial well-being of households (Kumar et al. 2023a). In light of the empirical evidence presented above, the following hypotheses are posited:

**H1.** *Financial Attitude is a significant determinant of financial decision-making.*

### *2.2. Subjective Norms/Prescriptive Influence Influencing Financial Decision-Making*

This refers to the perception of whether the majority of people find the behavior acceptable or not. It has to do with a person's thoughts regarding whether or not important individuals and peers believe that he or she should engage in the behavior (Green and Heekeren 2009). The desire for financial security is increasing in a society characterized by economic instability. Individual differences are crucial in attaining an elevated state of financial well-being (Kaur et al. 2023). Diverse psychological, behavioral, and demographic aspects influence financial decision-making, promoting the creation of a viable and profitable financial portfolio to secure the long-term financial well-being of households (Kijkasiwat 2021). Retirement attitude, perceived behavioral control, and subjective norms each show a positive correlation with the intention to plan for retirement. Moreover, the findings indicated that behavioral intention and perceived behavioral control are positively correlated with the financial behavior of working individuals. The results may assist financial educators and advisors in providing the appropriate combination of financial knowledge to help working individuals make improved financial decisions and engage in sound financial practices (She et al. 2023).

The growing intricacy of the investing landscape has expedited the demand for enhanced financial advisory services of superior quality. An essential aspect of providing high-quality guidance is the advisers' precise evaluation of their clients' risk profiles. Usu-

ally, a client's risk characteristic is evaluated by assessing their risk tolerance rather than their risk perception. In order to evaluate the extent to which this approach is unable to accurately determine the client's level of risk, we examine both their willingness to take on risk and their perception of risk within the context of investment decision-making (Nguyen et al. 2019; Antonides and Van Der Sar 1990).

**H2.** *Subjective Norms or family factors are significant determinants of financial decision-making.*

### *2.3. Perceived Behavioral Control Influencing Financial Decision-Making*

Perceived behavioral control refers to an individual's perception of how easy or difficult it is to do a specific behavior. A person's confidence in their ability to execute a task significantly impacts their behavior. Self-efficacy helps to explain a variety of links between beliefs, attitudes, intentions, and behavior. Here, perceived financial capability is taken as self-efficacy or confidence. This study discovered a notable and beneficial influence of financial literacy, as well as its various aspects, on both financial self-efficacy and financial well-being. Additionally, it was discovered that the impact of financial literacy on financial well-being is partially influenced by financial self-efficacy (Lone and Bhat 2024). Attitude, subjective norms, and perceived behavioral control exert a favorable and substantial impact on investment intentions. Nevertheless, financial literacy has an insignificant effect on investing intention (Hidayati and Destiana 2023).

There is a favorable correlation between financial knowledge and the attitudes towards retirement, perceived behavioral control, subjective standards, and financial behavior of working adults. Furthermore, the results indicated that retirement attitude, perceived behavioral control, and subjective norms were all positively correlated with the intention to engage in retirement planning. Moreover, the findings showed a significant correlation between the purpose of acting and the perceived ability to control one's behavior with the financial actions of employed individuals (She et al. 2023; Che Hassan et al. 2023). The components of the Theory of Planned Behavior (TPB), namely, attitude (ATT) and subjective norms (SNs), have a strong correlation with investment intentions (INTs). However, perceived behavioral control (PBC) does not have a significant correlation with INTs. In addition to the original components of the TPB model, Trust in Financial Institutions (TFI) and Financial Literacy (FL) were also included in the model. These factors have a substantial impact on investors' desire to invest in the stock market (Adil et al. 2023).

**H3.** *Perceived behavioral control is a significant determinant of financial decision-making.*

### *2.4. Digital Financial Literacy Influencing Financial Decision-Making*

Digital literacy refers to using and navigating digital technologies effectively and responsibly. It encompasses the skills, knowledge, and attitudes required to utilize digital devices, applications, and online platforms for various purposes, such as communication, information retrieval, critical thinking, problem-solving, and creativity. Digital literacy involves understanding digital tools, evaluating information from digital sources, managing digital content, and protecting privacy and security in the digital realm. It also includes adapting to new technologies and continuously learning and upgrading digital skills (Martin 2008).

Understanding and weighing the costs, risks, and rewards of financial goods and services, such as bank accounts, credit cards, loans, insurance, and investments, is a necessary component of financial literacy. In order to accomplish both short- and long-term financial goals, it also entails evaluating financial data, including statements, budgets, and economic indicators, and making wise financial decisions (Lusardi and Mitchell 2014).

**H4.** *Digital and financial literacy have a significant influence on financial decision-making.*

### 2.5. Financial Accessibility Influencing Financial Decision-Making

The capacity of people or businesses to obtain financial services, such as credit, deposits, payments, insurance, and other risk management services, is known as access to finance (Demirgüç-Kunt et al. 2008). Access to financial services gives opportunities for generating income, accumulating assets, and participating more fully in economic activities, thereby encouraging economic and social empowerment. In addition to providing resilience against shocks such as the COVID-19 pandemic, financial inclusion emphasizes the need to make sure that the most vulnerable groups have access to formal financial services (World Bank 2021), as financial inclusion and accessibility are recognized as critical drivers of economic growth and poverty alleviation. It ensures universal access to valuable and affordable financial services delivered responsibly and sustainably. The Reserve Bank of India, releasing the National Strategy for Financial Inclusion (2019–2024), defined 'financial inclusion' as "the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost" (PRS 2020)

**H5.** *Financial accessibility has a significant influence on financial decision-making.*

### 2.6. Financial Decision-Making Influencing Intention towards Investment

The intention of the investors to invest in various instruments is known as investment intention or intention towards investment. It is clear from the study that behavioral factors have an impact on the investment intentions of investors. Emotional factors have a significant effect on investors' financial investment decisions. Investment paradigms often disregard emotions. Anxiety, happiness, and optimism are reliable markers of a more complex concept known as emotional finance. The results also indicated a strong correlation between emotional intelligence in financial matters and investing performance. Simultaneously, it has been determined that investor protection is not correlated with investment performance (Irfan et al. 2023). Financial literacy should be regarded as an essential entitlement and universal necessity rather than a privilege limited to a small number of customers with exclusive access to financial knowledge or guidance. Financial literacy should be regarded as equally significant as basic literacy, which refers to the capacity to read and write in the modern period. In the absence of it, both individuals and society are unable to achieve their maximum capabilities (Lusardi 2019).

**H6.** *Financial decision-making is a significant determinant of intention towards investment.*

### 2.7. Financial Resilience Influencing Financial Decision-Making and Intention towards Investment

Resilience is the capacity to creatively adjust to complicated life events and perform well in the face of uncertainty, upheaval, or difficult or dangerous circumstances. Financial resilience is the capacity to withstand both favorable and unfavorable life circumstances that have an impact on one's assets and/or income (Xiao and O'Neill 2011). One of the study's proposed hypotheses was to check how financial resilience affects the relationship between financial decision-making and intention toward investment. Financial resilience is built upon the adoption of sound financial planning practices (Yeo et al. 2023).

Research revealed a strong and significant correlation between financial literacy and investment decisions. Furthermore, the findings indicate that having excessive confidence had a beneficial impact on investment choices. Additionally, the connection between financial knowledge and investment selections was positively and significantly influenced by overconfidence (Seraj et al. 2022; Kumar et al. 2023b).

**H7.** *Financial resilience has a significant influence on intention towards investment.*

It is evident from the literature review that the studies on financial capability are mainly conducted on consumers, emerging adults, and millennials, and few studies deal with measuring the financial resilience of women. Similarly, most of the studies are conducted in developed nations such as European countries and North America. Similarly, there is a lack of studies that deal with measuring the financial capability of women, as most of the studies deal with financial literacy and financial inclusion and do not cover the behavioral aspects combined with the knowledge and skills of this group or their perspectives. Similarly, no such study has yet been conducted that shows how financial capability influences women's intention to invest. Similarly, most of the studies conducted on women deal with financial inclusion, women's empowerment, and financial literacy, and none of the studies focused on analyzing the behavioral aspects of women dealing with either financial capability or financial resilience. Thus, it is imperative to know the financial capability of women and also how it affects their financial well-being. Furthermore, globally, women have fewer economic opportunities. Less than half of all eligible women participate in the labor force, compared to 75% of men (Dhanamalar et al. 2020).

Additionally, women are more likely to hold vulnerable, low-paying, or devalued occupations as well as engage in informal employment. The COVID-19 pandemic exacerbated the situation by resulting in unparalleled employment losses, primarily affecting women and exacerbating gender disparities. The availability of financial services is not equal for men and women. Women made up 56% of those without bank accounts even before the pandemic, which means that about a billion women lack access to banking (Kumar 2023). The epidemic has prompted economies to reconsider, reconstruct, and transition toward inclusive, environmentally sustainable digital communities and enterprises. Technology plays a crucial role in making the vision possible, and women are leading the way in embracing digital and environmentally friendly financial solutions to attain economic and social objectives. Nevertheless, women continue to be inadequately represented while experiencing more negative impacts from environmental issues and having less access to digital money compared to males (Tailor 2023).

**Proposed Hypothesis:**

This study seeks to promote digital financial literacy and Fintech adoption among women in India by examining the impact of various factors on their behavioral intention and usage patterns. In this study, the relationships were examined between several independent variable, namely, financial attitude (FAtt), subjective norms (SNs), perceived behavior control (PBC), digital financial literacy (DFL), and financial accessibility (FA), on the dependent variable financial decision-making (FDM), as shown in the Figure 3.

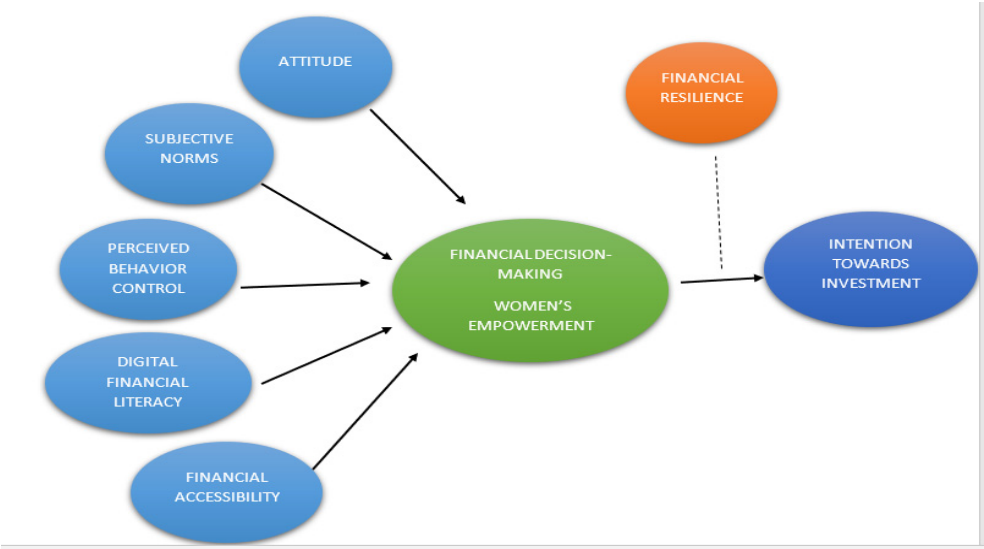


**Figure 3.** Conceptual framework of financial decision-making.

## 3. Materials and Methods

**Selection of Research Approach:**

Based on the study requirement, the researchers decided on the type of study to be conducted.

**Research Approach:**

We used quantitative methods to analyze the responses received through questionnaires. Digital and financial literacy is part of financial inclusion, which has a natural environment and is connected with many other factors that are directly tied to the empowerment of urban and rural people. The data are exploratory as they test the hypotheses pertaining to the independent and dependent variables. The analysis of the literature revealed that a number of important elements, including income, employment, bank fees, the quality of services, financial education, and accessibility of financial instruments and services, had an impact on the degree of digital and financial literacy. The purpose of this study is to ascertain the variables or elements influencing women's financial decision-making.

**Quantitative methods:**

This research used quantitative methods, such as a survey, to collect data from women in the States of Uttarakhand and Uttar Pradesh in India who had received financial and digital literacy training. The survey included questions about their economic participation, financial decision-making skills, and the impact of financial and digital literacy training on their lives. The data collected were analyzed using statistical software to identify any correlations or patterns.

**Research Design**

This section includes the study population, sampling frame, sample size determination, and sampling technique used. The study space was composed of women working in different sectors such as SHGs, MSMEs, healthcare, and educational institutions in the States of Uttarakhand and Uttar Pradesh in India.

**Sample Size:**

The sample size was determined based on the formula given by (Yamane 1967). (Cochran 1977) developed the equation for large populations to yield a representative sample for proportions.

$$n0 = Z^2pq/e^2 = (1.96)^2(0.5)(0.5)/(0.05) = 385$$

This is valid where n0 is the sample size, $Z^2$ is the abscissa of the normal curve that cuts off an area $\alpha$ at the tails ($1 - \alpha$ equals the desired confidence level, e.g., 95%), e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is $1 - p$. The value for Z is found in statistical tables, which contain the area under the normal curve.

**Sampling Method**

This study makes use of purposeful sampling. Purposeful sampling is a common technique used in quantitative research to identify and select cases that are highly informative about the subject of interest. Purposeful sampling is a technique that is commonly used in qualitative research to locate and select samples that are rich in information and make the most of the limited resosources available (Patton 2002). This entails locating and picking people, or groups of people, who have particular expertise or understanding of an interesting subject (Creswell and Clark 2011).

**Source of Data Collection:**

This study collected data from both primary and secondary sources. The primary data were collected for analysis using the survey method with the help of a structured

questionnaire. The questionnaire was developed based on the literature review. However, the scale was modified to suit the needs of the study. Respondents received prior instructions on completing the questionnaire and were informed that their information would remain confidential and used solely for research purposes. The primary data for the study were collected by a survey method utilizing a structured questionnaire included as Supplementary material. The data were gathered by a questionnaire administered to respondents during in-person conversations. Prior to data collection, the respondents received a briefing on the aims of the data collection, and the questionnaire was explained to them in Hindi or their native language before they completed it with the assistance of an interpreter. Open-ended questions were used to collect data regarding the respondents' backgrounds and demographics. The data pertaining to the various constructs or variables of the study were gathered using questions formulated using a Five-Point Likert Scale. The entire questionnaire was segmented into sections according to the study's variables.

A structured questionnaire was used for the survey. A 5-point Likert scale was used, with 5 points assigned to "very strongly", 4 points to "strongly", 3 points to "neutral", 2 points to "disagree", and 1 point to "strongly disagree". A semi-structured questionnaire for respondents was designed and utilized to collect data from working women. Data collection for the study was conducted in the months of December 2023 to June 2024. The questionnaires that were half-filled and did not have proper responses, i.e., incomplete questionnaires, were removed from the analysis. The questionnaire was carefully and systematically designed according to the objectives of the study. For quantitative data analysis, a **reliability test** was performed to determine the reliability of items used in the questionnaire, and then a confirmatory factor analysis was conducted to confirm the factors that influence the investment behavior of women working in the States of Uttar Pradesh and Uttarakhand in India. The researcher administered the questionnaires through email and personal contacts to collect the data from women. Secondary data were collected based on keywords such as financial literacy, digital literacy, Fintech, Sustainable Development Goals (SDGs), women's empowerment, financial well-being, financial resilience, and financial decision-making and considered various research articles, journals, newspapers, and reports that are relevant to our research topic and research objectives. The measurement scale items for "financial literacy" were adopted from (Rastogi and Ragabiruntha 2018).

**SEM was used to understand the impact of Digital and Financial literacy on Investment behavior.**

**Dependent Variables:**

In line with earlier studies (Allen et al. 2012; Demirguc-Kunt and Klapper 2013; Nino-Zarazua and Copestake 2008; Efobi et al. 2014; Y. Gitaharie et al. 2014) that focused on the sample using a structured questionnaire. This research recognizes digital and financial literacy by considering women as 'included' if any are financially and digitally literate. The dependent variable is the 'Inclusion Score'. The various factors (explanatory variables) selected are in accordance with the findings of the literature.

Digital and financial literacy is an indicator of investment behavior and contributes to women's empowerment. We analyzed the association or impact of digital literacy on women's empowerment, which includes financial decision-making, financial access, literacy, and resilience.

**Independent Variables:**

The independent variables included Gender, Income, Age, Education, Occupation, Bank information (bank account, loan, deposits, savings, no. of accounts, chequebook, ATM, credit and debit cards, frequency of access, ease of access), Ethnicity, and Investment objective. Integrating the perspective of the "digital divide between digital natives and digital migrants among women" would enhance the study by examining this divide and its influence on financial decision-making. Comprehending these distinctions would facilitate the creation of more inclusive digital financial literacy initiatives, ensuring that women of all ages and backgrounds are enabled to engage in the digital economy.

**Moderating Variable:** Financial resilience was used as a moderating variable between financial decision-making and intention towards the investment of women.

**Reliability Analysis:**

For checking the reliability of the scale after modification, Cronbach's Alpha value was used, which is significant in social science research for testing the reliability of the scale. Hence, if Cronbach's Alpha value is found nearer to 0.70, the researcher can continue with the questionnaire for his studies (Taber 2018).

**Confirmation of Measurement Items**

The measurement items were confirmed under the latent constructs through Confirmatory factor analysis (CFA). The CFA model confirmed the validity and reliability of scaled measurement items.

**Assessment of Reliability and Validity of the Measurement Instrument:**

To assess the accuracy of the measurement models, construct reliability, convergent validity, standardized factor loadings, critical ratio (*t*-value), composite reliability (CR), and average variance extracted were used.

## 4. Results

It is evident that the majority of respondents are married, with 81% of the 385 total respondents being married and 19% being single. The predominant demographic of respondents is aged 30 to 35. The highest proportion of women are literate at the graduation level, followed by those educated up to the 12th grade, postgraduate level, and the illiterate population. Approximately 60% of employed women have two children. A total of 29% of respondents are agricultural laborers, 20% are daily wage earners, 33% are salaried employees, and 18% are business owners. Nearly 55% of the respondents belong to the monthly income bracket of INR 20,000 to INR 40,000, whereas 15% are classified within the income range of INR 40,001 to INR 60,000. Additionally, 20% belong to the income bracket of INR 20,000 or below, while 10% earn above INR 100,000. The predominant percentage of respondents identifies as Hindu, at 85%, followed by Sikh, Muslim, and Christian affiliations. Sixty-five percent belong to the General category, twenty percent to OBC, ten percent to the SC category, and five percent to the ST group.

### *4.1. Hypotheses Testing*

At first, a preliminary inspection of the data was conducted to check for data accuracy, missing values, outliers, and normality. The analysis revealed no major issues except for some missing values, which were excluded from further analysis. Next, Structural equation modeling (SEM) was used to test the proposed hypotheses. As suggested by (Hair et al. 2010b), a two-step approach was adopted, wherein the measurement model (Confirmatory Factor Analysis) was run first to check the reliability and validity of the study constructs (Anderson and Gerbing 1982, 1988; Hair et al. 2010b, 2019). Thereafter, the structural model was specified and executed to test the structural path hypotheses. For the above purposes, AMOS 20.0 software was used. Since the data collection procedure involved a cross-sectional self-reported questionnaire, common method bias can be a problematic issue. Hence, it was deemed suitable to test for common method bias before moving on to the main analysis. The following are the results:

### *4.2. Common Method Bias (CMB)*

The CMB in the data was checked by deploying Harman's single-factor test. According to this test, the presence of CMB is recommended if a single factor explains most of the covariance, i.e., more than 50%. To rule out the presence of CMB, all 31 items were included in an unrotated principal component exploratory factor analysis, and a single factor was extracted. The results revealed that the first factor explained only 41.67% of the variance,

which is far less than the suggested cut-off of 50%. Hence, the threat of CMB was completely ruled out (Podsakoff et al. 2003).

### 4.3. Confirmatory Factor Analysis (CFA), Reliability, and Validity Analysis

A confirmatory factor analysis on all 32 items was performed in this step. As suggested by Bentler and Bonett (1980), the measurement model has a satisfactory goodness-of-fit to the data if the CFI, TLI, NFI, and GFI values are greater than 0.90 and the RMSEA value is less than 0.08. In the present case, the CFA measurement model achieved a satisfactory goodness-of-fit to the data (Chi square/df = 2.774; CFI = 0.906; NFI = 0.898; TLI = 0.912; GFI = 0.917; and RMSEA = 0.071).

Next, the reliability and validity analyses were performed to assess the measurement quality of the study constructs. For this purpose, the values of the average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha for all the constructs were calculated. According to (Hair et al. 2010a), the convergent validity is achieved if (a) the factor loading of each of the items is statistically significant and exceeds 0.70, (b) the reliability score for each of the constructs exceeds 0.70, and (c) the AVE value for each of the constructs exceeds 0.50.

The results of this analysis are presented in Figure 4 and Table 1 below, which clearly indicates that the measurement item loadings were significant and surpassed the threshold value of 0.70. Additionally, the AVE values for all study constructs surpassed the threshold value of 0.50. Moreover, the Cronbach's alpha values for all the constructs surpassed the required threshold. Hence, the convergent validity was well achieved (Table 1).

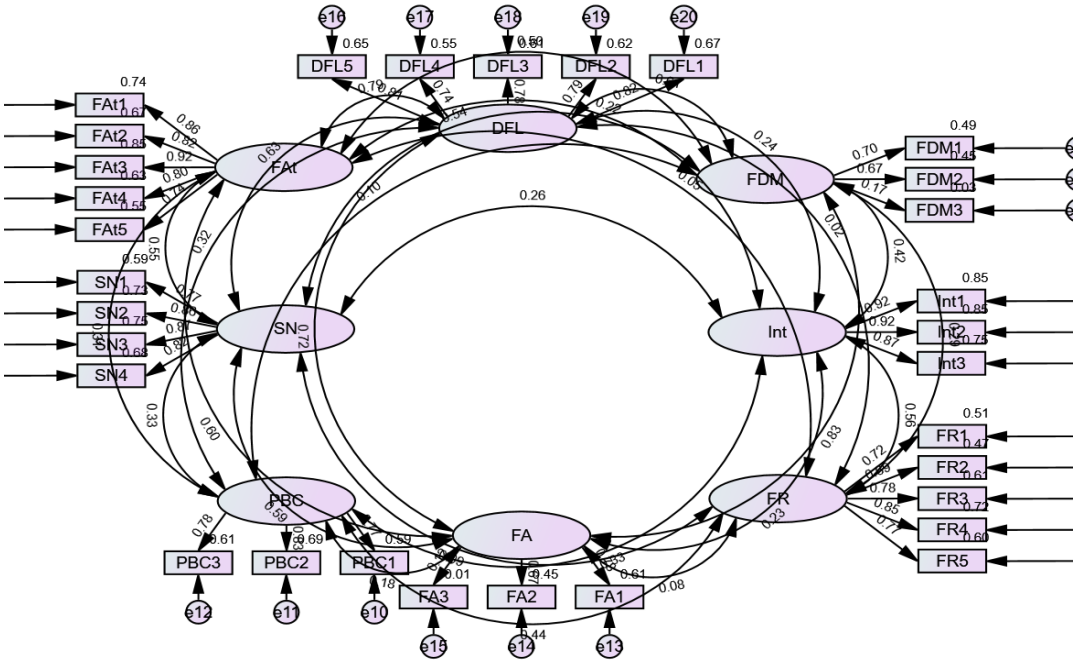


**Figure 4.** The measurement model.

Now, having found satisfactory convergent validity for each of the study constructs, an assessment of discriminant validity was performed. As suggested by (Hair et al. 2010b), discriminant validity is achieved if the square root of the AVE values exceeds the inter-construct correlations. The results of this analysis are presented in Table 2, which suggests that each construct is different from the other, and hence, discriminant validity is verified.

**Table 1.** Reliability and convergent validity analysis.

| Construct and Item | Standardized Estimate | Sig. | CR | AVE | Cronbach's Alpha |
|---|---|---|---|---|---|
| **Financial Attitude** | | | | | |
| FAtt5 | 0.745 | *** | 0.815 | 0.69 | 0.913 |
| FAtt4 | 0.795 | *** | | | |
| FAtt3 | 0.921 | *** | | | |
| FAtt2 | 0.82 | *** | | | |
| FAtt1 | 0.862 | *** | | | |
| **Subjective Norms** | | | | | |
| SN4 | 0.823 | *** | 0.898 | 0.689 | 0.821 |
| SN3 | 0.869 | *** | | | |
| SN2 | 0.857 | *** | | | |
| SN1 | 0.768 | *** | | | |
| **Perceived Behavioral Control** | | | | | |
| PBC1 | 0.768 | *** | 0.836 | 0.629 | 0.86 |
| PBC2 | 0.831 | *** | | | |
| PBC3 | 0.78 | *** | | | |
| **Financial Accessibility** | | | | | |
| FA1 | 0.779 | *** | 0.86 | 0.523 | 0.89 |
| FA2 | 0.671 | 0.035 | | | |
| FA3 | 0.716 | *** | | | |
| **Digital Financial Literacy** | | | | | |
| DFL5 | 0.805 | *** | 0.891 | 0.621 | 0.903 |
| DFL4 | 0.744 | *** | | | |
| DFL3 | 0.784 | *** | | | |
| DFL2 | 0.788 | *** | | | |
| DFL1 | 0.817 | *** | | | |
| **Financial Decision-making** | | | | | |
| FDM1 | 0.702 | *** | 0.836 | 0.609 | 0.845 |
| FDM2 | 0.867 | *** | | | |
| FDM3 | 0.765 | *** | | | |
| **Intention Towards Investment** | | | | | |
| Int1 | 0.921 | *** | 0.93 | 0.815 | 0.923 |
| Int2 | 0.922 | *** | | | |
| Int3 | 0.865 | *** | | | |
| **Financial Resilience** | | | | | |
| FR1 | 0.716 | *** | 0.874 | 0.582 | 0.916 |
| FR2 | 0.688 | 0.029 | | | |
| FR3 | 0.779 | *** | | | |
| FR4 | 0.848 | *** | | | |
| FR5 | 0.772 | *** | | | |

Note: *** = significant at 1%, CR = composite reliability, AVE = average variance extracted.

**Table 2.** Discriminant validity results.

| Construct | FA | Fat | SN | PBC | DFL | FDM | Int | FR |
|---|---|---|---|---|---|---|---|---|
| Financial Accessibility (FA) | **0.629** | | | | | | | |
| Financial Attitude (FAtt) | 0.604 | **0.831** | | | | | | |
| Subjective Norms (SNs) | 0.593 | 0.551 | **0.830** | | | | | |
| Perceived behavior Control (PBC) | 0.298 | 0.308 | 0.327 | **0.793** | | | | |
| Digital Financial Literacy (DFL) | 0.668 | 0.601 | 0.633 | 0.323 | **0.788** | | | |
| Financial Decision-making (FDM) | 0.631 | 0.496 | 0.539 | 0.491 | 0.613 | **0.567** | | |
| Intention towards investment (Int) | 0.551 | 0.444 | 0.558 | 0.331 | 0.236 | 0.421 | **0.903** | |
| Financial Resilience (FR) | 0.562 | 0.452 | 0.503 | 0.439 | 0.521 | 0.289 | 0.562 | **0.763** |

Note: Off-diagonal elements represent inter-construct correlations, whereas the diagonal elements represent the square root of the average variance extracted.

### *4.4. Path Analysis and Hypotheses Results*

Following a two-step approach (Anderson and Gerbing 1988), the data were examined using structural equation modelling. To do so, data imputation was performed, and path analysis was performed on the imputed values of the latent constructs. Similar to the measurement model, the path model also showed good model-fit diagnostics (Chi square/df = 2.805; CFI = 0.911; NFI = 0.890; TLI = 0.913; GFI = 0.912; and RMSEA = 0.072). This indicated that the model fits well with the data.

The hypothesis results are presented in Table 3. As indicated in Table 3 and Figure 5, all the main effects as proposed in Hypotheses 1–6 were found to be statistically significant ($p < 0.05$) and thus supported. As hypothesized in H1, financial attitude (FAtt) leads to higher financial decision-making (FDM), exerting moderate effects. Similarly, Subjective norms (SNs), perceived behavioral control (PBC), digital financial literacy (DFL), and financial accessibility (FA) significantly lead to financial decision-making (refer to Table 3). All five predictors of financial decision-making explained around 71% of the variance. Finally, financial decision-making exerted a significant and robust effect on intention towards investment (beta = 0.48, $p < 0.05$) and explained 23% of the variance. The results are shown in Figure 5 and in Table 3 below.

**Table 3.** Hypotheses results.

| Hypothesis | Relationship | Unstandardized Estimate | Standardized Estimate | S.E. | C.R. | *p* |
|---|---|---|---|---|---|---|
| **H1** | FDM<---FAt | 0.133 | 0.145 | 0.045 | 2.984 | 0.003 |
| **H2** | FDM<---SN | 0.169 | 0.221 | 0.032 | 5.273 | *** |
| **H3** | FDM<---PBC | 0.146 | 0.198 | 0.024 | 6.062 | *** |
| **H4** | FDM<---DFL | 0.228 | 0.243 | 0.046 | 4.984 | *** |
| **H5** | FDM<---FA | 0.371 | 0.45 | 0.037 | 10.031 | *** |
| **H6** | Int<---FDM | 0.762 | 0.481 | 0.074 | 10.285 | *** |

Note: FDM = financial decision-making, FAtt = financial attitude, SN = subjective norm, PBC = perceived behavioral control, DFL = digital financial literacy, FA = financial accessibility, Int = intention towards investment, S.E. = standard error, C.R. = critical ratio. The *p* value is the same for all hypothesis i.e., 0.03. *** = significant at 1%

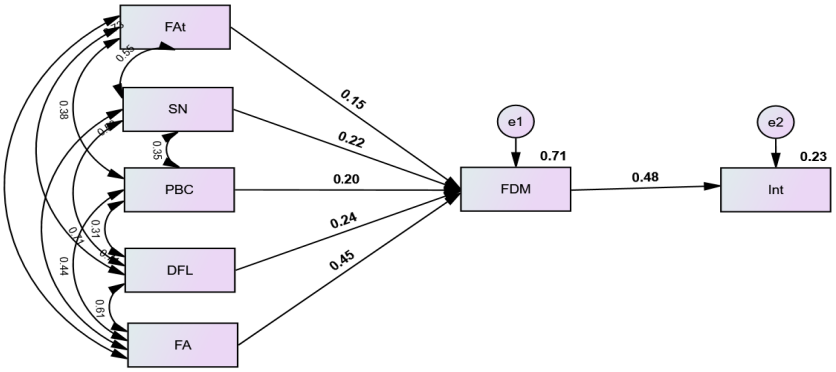


**Figure 5.** Path model.

**Moderation analysis:**

One of the proposed hypotheses of the study was to check how financial resilience affects the relationship between financial decision-making and intention toward investment. In statistical parlance, the idea was to test whether the effects of financial decision-making on intention towards investment are moderated by financial resilience. To do so, the SPSS PROCESS macro was used, and model 1 was run in accordance with Hayes (2022). The results showed that financial resilience significantly moderated the effects of financial decision-making on intention towards investment (from Table 4, interaction term = 0.342, t = 11.7931, $p$ = 0000 < 0.01).

**Table 4.** Test of moderation.

| Effect | Interaction | Beta | SE | T | *p* | LLCI | ULCI | Moderation |
|---|---|---|---|---|---|---|---|---|
| PA → AL_P | Int_1 | 0.342 | 0.029 | 11.7931 | 000 | 0.0215 | 0.0327 | Yes |

Further, a deeper look at the conditional process analysis shows that the effects of financial decision-making on intention towards investment were highest for those who had higher financial resilience and low for those who had lower financial resilience. These results are summarized in Table 5 below.

**Table 5.** Conditional process analysis of the values of the moderator.

| Relationship | Moderator Values | Beta | SE | *t* | *p* | LLCI | ULCI |
|---|---|---|---|---|---|---|---|
| **FDM → Int** | Low | 0.1539 | 0.0555 | 2.77297 | 0.0031 | 0.0547 | 0.2441 |
| | Medium | 0.3448 | 0.0294 | 11.7279 | 0000 | 0.3472 | 0.4325 |
| | High | 0.6086 | 0.0533 | 11.4184 | 0000 | 0.5157 | 0.7325 |

## 5. Conclusions

Globally, emerging technologies are utilizing alternative data to evaluate creditworthiness, eliminating the requirement for conventional credit records or collateral. As women have a lower likelihood of owning fixed assets compared to males, this is contributing to the narrowing of the gender gap. Insufficient financial knowledge is hindering numerous women from taking advantage of technology advancements. Therefore, it is crucial that we actively advocate for digital literacy initiatives specifically targeting women, as these campaigns aim to develop their abilities and knowledge in this field. Furthermore, by facilitating women's access to financial services, policymakers can open up several possibilities to increase their involvement in the digital realm.

The correlation between the empowerment of women and green microfinance is partially influenced by their level of financial literacy. Local wisdom-based financial literacy is

identified as a viable option for integrating women's empowerment into local development. Furthermore, it is important for gender-specific initiatives to take into account policies that promote literacy in order to achieve long-term sustainability in green microfinance. This study enhances the existing knowledge on the correlation between women's empowerment and green microfinance by including financial literacy as a mediating variable (Lee and Huruta 2022). The inclusion of women in financial literacy initiatives is a significant catalyst for attaining many Sustainable Development Goals. Providing women with equal opportunity for financial literacy results in extensive societal advantages, including poverty alleviation, economic expansion, and gender equity. Consequently, emphasizing inclusivity in financial literacy programs transcends gender concerns and serves as a means to attain sustainable development and mitigate global disparities. Governments should have a pivotal role in advancing green finance by providing policy assistance and fostering partnerships with financial institutions, enterprises, and civil society organizations. Policymakers can foster regional economic resilience by establishing regulatory frameworks, providing tax incentives, and offering subsidies that promote green investments (Wei 2024). To render digital financial literacy genuinely successful and inclusive, it is imperative to incorporate financial and cyber fraud awareness as a fundamental element. Such actions would not only alleviate the threats associated with cybercrime but also enhance confidence and security for women as they engage with the digital financial environment. Failure to overcome this constraint in digital financial literacy programs may render women susceptible to financial exploitation, hence hindering their complete engagement in the digital economy and compromising initiatives aimed at achieving gender parity and financial inclusion in accordance with the SDGs. The reduced reliance on others due to digital financial literacy is a vital aspect of women's empowerment, providing them with autonomy, privacy, and the capacity to make independent financial decisions. Incorporating this element into the research would bolster the case for digital literacy as a vital instrument for achieving gender equality and financial autonomy. It strongly coincides with the Sustainable Development Goals (SDGs) pertaining to gender equality (SDG 5), poverty alleviation (SDG 1), and economic advancement (SDG 8).

## 6. Implications

With a clear vision for boosting financial capability and inclusion, this research has important implications for policymakers. The ability of policymakers to create and implement policies that produce better outcomes and give people the necessary financial knowledge and skills to survive in the modern world is enhanced. This study offers helpful data that will enable the authorities to concentrate on people's financial literacy and inclusion, which will ultimately lead to their financial independence and contentment. This report offers recommendations on how women in the financial and non-financial sectors should handle money-related decisions and issues. Furthermore, this study provides recommendations to researchers and academicians for improving their comprehension and awareness of the changeable orientation toward finance that the researchers have not thoroughly investigated. India, with a population of over 1.4 billion, serves as a case study for digital and financial inclusion initiatives in emerging economies. Investing in digital financial literacy for women transcends just economic necessity; it serves as a potent instrument for social transformation. The analysis undertaken in India will offer essential insights into the role of digital financial literacy in promoting financial inclusion and advancing the Sustainable Development Goals worldwide. We urge governments, officials, international organizations, and stakeholders to endorse and advance policies that foster a more inclusive and equitable society for women. This plea emphasizes the issue's local importance and global relevance, positioning the research as a crucial advancement in fulfilling the SDGs and fostering gender equality globally.

## 7. Recommendations and Suggestions

a. More education campaigns about the advantages of basic banking services should be developed at all levels, particularly in rural and economically underdeveloped areas.
b. In order to fulfill the goal of conducting these promotional programs—namely, to give basic banking facilities on a bigger scale—the government should make sure that their different programs, such as the "Jan Dhan Yojna", explicitly reach tribes, especially those living in rural and tribal areas.
c. If someone truly wants to increase their financial literacy, they must seize the opportunity and make use of the available financial resources. To do so, people must attend an increasing number of workshops, seminars, and financial management courses in their local area.
d. Banks should use vernacular, regional, and local languages when communicating with customers in rural areas, as this may make information more accessible for women to understand. This is because women's literacy rates, particularly in rural areas, are meager.
e. The government should disseminate information about literacy programs, particularly in rural and underdeveloped areas, to enable rural residents to participate and acquire basic numeracy skills, which will aid in their empowerment and the well-being of their families.
f. Families should discuss matters pertaining to basic finance and money-related issues, particularly with regard to female children. This will help the latter understand the true meaning of empowerment from an early age and help them grasp the fundamentals of financial literacy and its importance for their future.
g. In order for women to use their earned income more wisely to ensure their future and after retirement, which eventually aids in reaching their financial objective, they need to develop the habit of financial planning as soon as they begin earning and be clear about their long-term financial goals.

## 8. Scope for Future Work

Addressing current challenges, including cybersecurity awareness, access inequities, behavioral economics, and the influence of innovative technology, can yield more complete solutions for enhancing financial inclusion. Collaborative, international research and longitudinal impact studies can expand the scope, ensuring global significance and promoting inclusive development. Further studies should examine women's empowerment levels in KSA in light of the UN SDGs and Saudi Vision 2030 (Saudi Vision, Saudi Vision 2030 2016).

**Author Contributions:** D.M. oversaw the study's conception and carried out the primary literature review, data collection, and analysis. N.A. and S.S. worked on conceptualization and made improvements to the study's goals and techniques possible. The final manuscript's technical parts, including data analysis, validation, interpretation, and conclusion, were assisted by V.K., D.M., and N.A. All authors completed the writing of the text and the literature review. The final manuscript was read and approved by all writers. All authors have read and agreed to the published version of the manuscript.

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