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Article

The effect of financial literacy on investment decision making in Kingdom of Saudi Arabia: An empirical study

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Abstract: Background: People who are financially literate are able to make sound decisions regarding their money since they have a firm grasp of the fundamentals of money and financial products. The significance of financial literacy has been acknowledged by numerous nations, prompting the formation of task teams to assess their populations and develop educational and outreach programs. The requirement to make educated decisions about ever-increasing financial goods necessitates a higher level of financial literacy. **Aim:** Being able to make sense of one's personal financial situation is becoming an increasingly valuable skill in today's world. One of the most essential components for making sure and successful decisions is having a good grip on one's financial status. By contrast, financial literacy refers to an individual's level of knowledge and awareness regarding financial matters, whereas investors' decision-making is characterised by their understanding, prediction, investigation, and assessment of the various stages and transactions involved in making an investment decision. Risk, a decision-making framework and process, and investing itself are all components of investing. **Method:** Researchers will conduct a cross-sectional survey of Saudi Arabian investors. We used a structured questionnaire to gather data. Using "Cronbach's a and confirmatory factors" analysis, we checked whether the data is reliable. The links between financial literacy and investment decisions was demonstrated using structural equation modeling (SEM) in IBM-SPSS and SmartPLS. **Purpose:** The purpose of this research is to look at how the investment choices of Saudi Arabians are correlated with their degree of financial literacy. Consequently, research on the connection between financial literacy, knowledge, behaviour, and investment choices is lacking. Researchers on this subject have already acknowledged the problem's importance and intended to devote substantial time and energy to solving it. **Findings:** The study concluded that there was a significant relationship between financial literacy and financial knowledge with respect of investment decision of investors. Similarly, there was a significant relationship between financial behaviour and financial knowledge with respect of investment decision of investors. The discovery of the outcomes will enable regulatory authorities to aid investors in preventing financial losses by furnishing them with sufficient financial information.

Keywords: financial literacy; financial knowledge; financial behaviour

1. Introduction

Investors' familiarity with financial ideas, goods, risks, and markets is known as financial literacy. The capacity to make sound decisions and assessments in the context of financial resources and asset management is another way of putting it. Financial Literacy offers understanding the functioning of banks and commodities markets, including confluence of debt and credit management to opt for responsible choices and therefore create responsible decisions. However, participation in modern finance put some relevant queries and options before investors looking to invest money. A clear knowledge of the various techniques of investing funds can help a person to take a smart decision to reach to his or her investment goals (Khan et al., 2021).

Knowledge in Finance is very often regarded as key to be financially literate. Financial knowledge outperforms knowledge required to perform day to day social duties. It helps in providing information that may be used for future savings as contrast to general knowledge that helps in current consumption decision. The financial knowledge inculcates a habit of risk-taking behavior among individuals as opposed to general knowledge. It helps to select the best financial products suiting the individual conditions. It enables prediction by an individual among the condition of uncertainty. In fact, knowledge about financial management, skills and individual behavior are supposed to have mutual relationship among each other. While an individual takes any financial decision, his/her knowledge is getting reflected in behavior.

Investors choose to stick to secure investments or preserve their money instead of diversifying their holdings into new marketplaces since they don't understand financial products. Financial products with low or no risk are not appealing to them as investment opportunities. In order to make educated judgments and earn comparatively high returns compared to other investment options, financial literacy is all about comprehending and raising awareness about financial products and how they work in the markets. Concerns over people's ability to safeguard their financial wellbeing are heightened by low levels of financial literacy and awareness.

A lot is happening in the corporate sector right now. Investors and shareholders need to be well-versed in investment decision-making in order to assess potential investments and choose the most lucrative businesses to put their money into. This evaluation should take into account factors such as the investor's capital and return expectations, the length of time they are willing to commit to the investment (long-term vs. short-term), the sector's risk profile, and the opportunities available to them. According to Kefela (2011), one must be aware of various investment opportunities, investment securities, and the advantage that comes with investing in order to make an investment decision (Lusardi and Messy, 2023). In light of this, investors need pay close attention to financial literacy is essential for making optimal investing decisions. (D.A.T, 2020) defined financial literacy as the capacity to effectively strategize and oversee financial choices, such as insurance, investments, savings, and budgeting.

Financial literacy provides information related to various regulations and support by Government to end consumers whereby he/she feels protected and thereby encourages risk taking behavior. It also guides an individual with different ways to know about avenues of grievance redressed mechanism. In fact, all literacy in financial world comes through education. In other way it can be understood as it's not a skill that is naturally acquired. Somebody should impart financial education in order to make the society financially literate. Financial education can be understood as a medium by which public at large can develop an understanding of various financial products, services available thereby empowering themselves in trade and commerce. Knowledge and skills acquired through financial education help in nurturing better standard of living in future.

Every nation has the same problem: a shortage of financially literate customers. Financial literacy is the level of understanding, skill, and attitude one possesses when it comes to money and how to manage it (Andriani et al., 2023). To live a healthy and happy life, one must be able to make informed decisions. Nowadays, with so many complicated goods on the market, it's impossible to escape the need for financial literacy. Saudi Arabia's government is well-positioned to encourage financial literacy among the country's enormous youth population (Saima and Khan, 2020). The promotion of financial literacy has been a top focus for a number of public and private institutions. Due to the complexity of financial commodities, widespread ignorance about these goods, and a lack of public awareness about the necessity of financial education, there is a pressing need for more financial literacy (Siddiqui et al., 2021). The degree to which people are competent with money concerns varies greatly. A lack of financial knowledge is strongly associated with the gender gap. Typically, a woman's particular life experiences shape her financial decision-making and money-related behaviors. There is a close relationship between an investor's emotional, financial, and familial lives (Khan, Alakkas, et al., 2023). When people don't have the means to get their hands-on trustworthy information, their financial literacy and competence suffer.

Researchers from every corner of the globe have looked at various ways to gauge financial literacy (Singh and Gupta, 2021). The level of financial literacy among the general public has been the subject of surveys conducted by governments worldwide. Their lack of financial literacy has been demonstrated by the majority of studies (Janor et al., 2016). Finding out how financially literate young workers are and whether or not they are ready to manage their own money is the driving force behind this study. Their financial and informational resources, in addition to the challenges they encounter, are also the subject of the study (Oppong et al., 2023).

1.1. Statement of the problem/need of the study

With the increasing significance of financial literacy in recent decades, it is imperative for individuals to develop more self-sufficiency in the future. Given the variability of income and increased lifespan, individuals must engage in prudent financial planning for retirement, healthcare, and insurance. This necessitates acquiring the necessary skills to make appropriate financial decisions that empower them to manage their own circumstances and safeguard their financial welfare. This requires a conducive environment that is appropriate for education and the acquisition of knowledge. Oftentimes, individuals who possess a rudimentary comprehension of saves and Investors frequently lose money in the market because they aren't aware of the risks associated with their financial decisions. This necessitates the establishment of a structured educational framework that incorporates hands-on instruction, hence promoting true literacy.

Thus, a study examining personal decision-making as it relates to financial literacy has been chosen to assess the extent of success of such programs. This study focuses on a particular country, such as Saudi Arabia, where there is a significant inequality observed in various important elements of human life.

1.2. Relevance of the study

As the financial market grows, it introduces a diverse range of novel products, services, and procedures. These products and services can help consumers and investors improve their financial well-being. In particular, financial literacy enables people become more knowledgeable about and comfortable using various financial goods and services. Managing the many cultural, linguistic, and socioeconomic aspects of Saudi Arabia is a significant challenge when it comes to establishing a standardized understanding of financial goods. Individuals must carefully assess their needs and subsequently make investments that align with those needs.

1.3. Significance of study

The primary objective of this research is to determine the extent of awareness and understanding among investors regarding different investment opportunities and accessible financial technology. Furthermore, it is important to determine whether an individual's level of literacy has a notable influence on investors when making decisions.

Conducting research will enhance our comprehension of investors' awareness regarding financial products, financial technologies, and the benefits of the digital economy. The research will facilitate other academics and researchers in conducting studies pertaining to Financial Literacy and its influence on Decision Making.

This study aims to discover trends among investment decisions based on the financial literacy of the Saudi Arabian population by comparing investment decision-making processes in Saudi Arabia with those in developing and emerging market nations (Khan, Vivek, et al., 2023).

2. Literature review

Investment Knowledge, Financial Literacy, Investor Attitude, Investor Behaviour, and Decision Making are the topics covered in this chapter, which summarises the current research on the subject. The literature aims to reflect the factors which impacts investors financial decision making. By utilizing it, a researcher can discern the favorable and unfavorable aspects of prior research and rectify any shortcomings in their own study. This chapter provides a concise examination of "the Effect of Financial Literacy on Investment Decision Making in Kingdom of Saudi Arabia". A number of factors related to financial literacy and how it affects investment decisions have been considered.

Financial literacy is significantly correlated with an individual's age, education, gender, and other demographic attributes. Financial literacy is a crucial prerequisite for the efficient operation of communities that handle retirement policy and demographics. Improving the community's general welfare is a byproduct of raising financial literacy levels. People are better able to manage their money and make smart decisions when they have more knowledge.

Despite the widespread belief that financial literacy promotes good financial habits and increases prosperity, research shows that many people still don't know enough to make sound financial decisions (Maheria, 2023). Low or negative savings rates, irresponsible investing, and not having enough money can lead to major and often permanent financial disasters (Morris et al., 2022). Scientists have discovered that people all over the world suffer from a severe lack of financial literacy.

The necessity to improve people's financial conduct and the widespread lack of financial literacy have been well-documented in the literature, but the reasons for this problem and the methods for addressing it remain less clear. There seems to be no connection between financial literacy and improved fiscal management. Research by Amisi (2012), and Khan, Alhathal, et al. (2023) suggests that learning about personal finance can lead to better fiscal habits. Contrarily, Arshad Khan and Alhumoudi (2022) discovered that students who were not required to take personal financial management courses behaved similarly to those who were.

The importance of financial services to a nation's economic growth, efficiency, and stability is now generally agreed upon. If people face substantial difficulties when assessing mainstream financial services, then this is an important topic to explore. In developed countries, many groups and individuals—including governments, businesses, and community interest groups—have begun to recognise the importance of financial literacy. With the advent of new financial products, the complexity of financial markets, and changes in social, economic, political, and demographic factors, the importance of improving financial literacy has lately grown.

Several authors have stressed the need to investigate the potential beneficial impacts of psychological and cognitive aspects on financial behavior (Khan and Minhaj, 2022). According to Raviprolu and Nagavali (2020), self-confidence is one of the psychological components proposed to explain financial behavior, whereas learning ability is seen as a cognitive feature of interest. A number of researches also looked at socio-demographic factors like education level, gender, ethnicity, and age. To yet, however, no comprehensive model has combined these to reveal the potential effects of their interrelationships on monetary behavior.

A thorough understanding of financial literacy and its connection to sound financial decision-making requires testing not just basic arithmetic skills but also familiarity with basic concepts like interest and inflation as well as more sophisticated concepts like stock, bond, and mutual fund market products (Lusardi, 2019). The propensity to put money into stocks was much lower among people who were financially illiterate.

The US, Canada, Western Europe, Australia, Japan, and Korea are just a few of the wealthy nations where financial illiteracy is common. These findings are in line with those of Ansar et al. (2023), Yet it was also demonstrated that most European respondents did not have adequate financial knowledge. Enhancements to Financial Literacy via Modifications to Individual Behaviour Multiple studies have demonstrated that having a good grasp of personal finance is associated with better money management (Choinière-Crèvecoeur and Michaud, 2023). The national Survey of Consumer Finances, which measured financial behavior, incorporated questions on financial literacy in 2003. Frisancho (2023) and Khan and Minhaj (2021) were the researchers behind this initiative. They constructed a Financial Practices Index based on four parameters: investment, cash flow, credit management, and savings.

The majority of European respondents scored poorly on tests of financial literacy, claims (Mohammed et al., 2023). Improvements in Financial Literacy through Behavioral Changes. Multiple studies have demonstrated that having a good grasp of personal finance is associated with better money management. The national Survey of Consumer Finances, which measured financial behavior, incorporated questions on financial literacy in 2003 (Minhaj et al., 2024). Fornero and Lo Prete (2023) and Gerrans et al. (2023) were the researchers behind this initiative. They constructed a Financial Practices Index by examining "cash-flow management, credit-management, savings, and investment." Participants' scores on the Financial Practices Index were correlated with their scores on a financial literacy test.

When looking at investments through the lens of classical theory (utility theory), investors will prioritize portfolio growth and profit (Gallo and Sconti, 2023). As a result, investors' level of financial literacy determines how rational they will be when making investment decisions (Lusardi and Mitchell, 2014). This means that investors will base their decisions on all relevant and measurable information, have access to credible sources, and can measure patterns of behavior (Thorp et al., 2023). To quantify this pattern of conduct, one must ensure that their investment decisions are based solely on their own self-interest, which means that they must adhere to the normative norms of classical economic theory (finance).

According to Arianti (2018), economic actors have a crucial role. It is clear that people's level of financial literacy influences their investing decisions based on their level of satisfaction with their own financial management. Previous work by Ayaa et al. (2022) proved the substantial influence of financial literacy on financial management. Since optimal information processing is a factor in investment decisions, it follows that financial literacy has a significant impact on investment decision making generally.

According to Hamza and Arif (2019), being financially literate means being able to weigh the pros and cons of potential choices, as well as determine the reliability of the data utilised in making such choices to find out what the decision's financial repercussions are, then analyze and assess that data. Financial literacy enables every individual to avoid making mistakes in managing his financial difficulties, such as having excessive debt due to uncontrolled use of credit cards or inadequate savings, as this explanation illustrates. Therefore, understanding of finance is very important for every person. the possibility of insolvency being considerable (D.A.T. et al., 2020). The findings of the study by Danila et al. (2019), which indicated that people with low levels of financial literacy often form incorrect judgments and make poor financial decisions, lend credence to this viewpoint.

Efforts to increase one's financial literacy can increase one's human capital, according to a modest body of research that finds financial literacy to be an endogenous variable. If we want to know which demographics might benefit most from early spending on financial education and sophisticated investment products (Abdullah and Tursoy, 2023), we need to create cross-sectional disparities in wealth-to-income ratios. However, no explicit multi-period theoretical model has been developed for this purpose in these analyses. As a mechanism, we propose that people who are financially literate are better able to manage their wealth throughout the course of their lifetimes.

Having a good grasp of personal finance allows people to make educated investment decisions, according to multiple researches. People who are financially literate are better able to handle their own money and are less likely to fall for other people's tricks. The study conducted by Khan (2021) results in less stock investment participation and greater reliance on friends and family for financial advice among individuals with lower levels of financial literacy.

The economy and stock markets benefit from increased financial knowledge. An efficient financial market is a product of financially savvy investors who, instead of acting irrationally, base their trade decisions on fundamental and/or technical research. According to the theory of behavioral finance proposed by Balagobei and Prashanthan (2021), individuals do not consistently make rational decisions, using all available information, and without any prejudice. The predominance of irrational variables is determined by the qualities, temperament, and behaviors of investors. The impact of financial literacy on the decision to invest is a subject of contention (Gumbo et al., 2022).

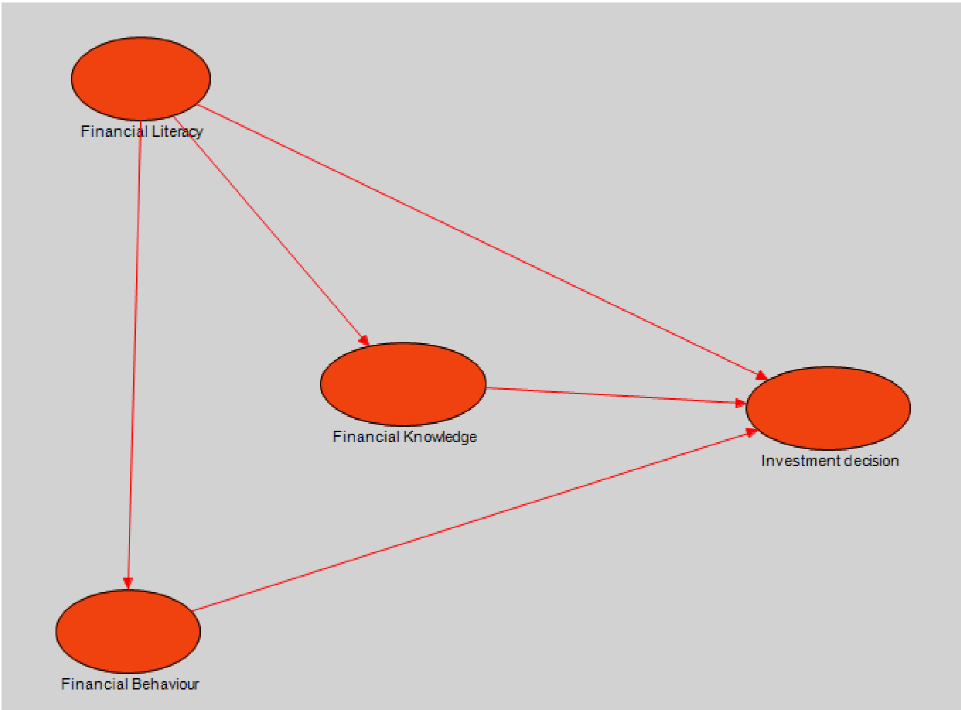

Figure 1. Proposed model.

In **Figure 1**, we can see how the suggested model reflects the connection between the various study variables taken from previous studies. There are only three exogenous variables namely financial literacy, financial knowledge and financial behaviour and investment decision one of the endogenous variables.

Among these are the most often used ones classical portfolio theory, role theory, and life cycle consumption theory.

Classical portfolio theory: According to classical portfolio theory, investors would be wary about trying out new financial instruments. Particularly for inexperienced household investors, this familiarity bias is a major issue. The credit derivatives market's meteoric rise, however, suggests that other variables may have been crucial in attracting such investors (Markowitz, 2009). We demonstrate, using exclusive Hong Kong household investment data, that the demand for structured financial products is heavily influenced by investors' level of financial knowledge. The allocation decisions of investors are not greatly impacted by important drivers, as determined by mean-variance analysis, such as product premium. Less buying was done by those who put their financial knowledge to better use, who are able to reasonably anticipate stock returns. Among the explanatory variables that have statistical significance are education, IQ, and ties to the distribution banks.

Role theory: Retirement, in role theory, is a repositioning of one's core identity role, which is often that of a wage earner. According to Kim and Moen (2001). People gain a sense of value and accomplishment from their roles. Çera et al. (2021) contribute to molding their conduct and sense of identity for example, Kim and Moen (2002). The loss of a basic social role is one reason why retirement, according to role theory, can be a difficult experience for people. As people learn to adapt to their new roles, they may experience feelings of vulnerability. Richardson and Kilty (1991), and Afshar et al. (2017) all point to the reality that some retirees may feel anxious and disconnected, which can result in a lack of happiness with life.

Prospect theory: Using known probabilities, Prospect Theory explains how to choose among risky alternatives (those with unknown consequences) (Clarke, 2017). In an effort to resemble actual decision-making, rather than ideal decision-making, the model takes a descriptive approach. The work of economic psychologists (Gisbert-Pérez et al., 2022), known as prospect theory, is among the field's most cited and extensively studied phenomena. According to the hypothesis, people's willingness to gamble with their profits is irrationally lower than their willingness to do the same with their losses. It furnishes a means of elucidating the decision-making process when faced with alternatives involving financial risk.

The life cycle model: Assuming they are making more money than they need to cover their basic expenses, it is possible for people to shift their spending priorities from times of high income to times of low income. Contributing to a pension while employed is largely known for this reason—the so-called smoothing of lifetime income (Gurung et al., 2020). The basic premise is that setting away a larger sum of money makes saving that much more manageable. Since people's spending and income are not perfectly correlated, this theory is crucial. Borrowing money while one is younger and saving up or investing in old age are two ways that people make up for relatively low salaries throughout adulthood (Kyeremeh, 2019). Several behavioral assumptions form the basis of the life cycle model: The lifecycle model postulates that people plan ahead for their use of resources by deciding how much they will receive at different points in their lives.

Theory on optimal Investment in financial literacy: Significant variation exists in both financial literacy and wealth levels across different groups, new research, however, shows that financial knowledge and household wealth are strongly correlated. Our stochastic life cycle model is calibrated to include the accumulation of financial literacy, which enables us to explore these patterns in detail. In comparison to more conventional lifespan models, ours produces far larger wealth inequality (Jappelli and Padula, 2013). This is because there is a correlation between the precautionary saving drive and the increased requirement for private wealth accumulation and financial literacy among higher incomes. This is because, on average, higher earners have lower retirement benefits and more hump-shaped labor income profiles.

Saving, investing, and borrowing are just a few examples of the many financial decisions that people make on a daily basis. The global marketplace is getting more precarious and susceptible every day. One of the main consequences of increasing pricing of goods and services is that it motivates individuals to make informed financial choices (Lusardi and Mitchell, 2011). A recent study from Australia examined financial literacy in relation to retirement savings and investing decisions through objective assessments of fundamental concepts and a high level of financial understanding and comprehension.

When looking at investments through the lens of classical theory (utility theory), investors will prioritize portfolio growth and profit (Atmaningrum et al., 2021). As a result, investors' level of financial literacy determines how rational they will be when making investment decisions. This means that investors will base their decisions on all relevant and measurable information, have access to credible sources, and can measure patterns of behavior (Ising, 2007). To quantify this pattern of conduct, one must ensure that their investment decisions are based solely on their own self-interest, which means that they must adhere to the normative norms of classical economic theory (finance).

Objectives:

1) To study the impact of financial literacy on investment decision.
2) To explore the impact of financial knowledge on investment decision.
3) To study the impact of financial behaviour on investment decision.

Hypothesis:

- H01: Financial literacy is positively related with investment decision.
- H02: Financial knowledge is positively related with investment decision.
- H03: Financial behaviour is positively related with investment decision.

Akims and Jagongo (2017) and Awais et al. (2016) have strong opinions on the need of knowing one's financial situation inside and out in order to make prudent choices with one's money. The ability to assess one's own financial position and make prudent decisions on the use of one's resources is known as financial literacy (Morris et al., 2022). Regarding this, a large body of research has evaluated the general public's and students' financial literacy. The Jump$tart questionnaire has been used by some authors (Musundi, 2014) and by others (D.A.T, 2020) to measure financial knowledge or its components.

Research gap: Various studies have been conducted in the area if financial literacy but mostly have focused on one or two variables of financial literacy at a time. Few researches have taken into account the interplay between financial knowledge, attitude, and behaviour as a whole. A large body of research has sought to determine the effect of investors' financial literacy on predetermined actions, as this review reveals. Therefore, present study uses all dimensions to calculate financial literacy of investors. Main aim of financial literacy is to improve decision outcome of investors. Various studies have studied relation between financial literacy and decision making but attitude being a mediating variable in decision of investors have not been studied in Saudi Arabia context so far. Along with literacy level of investors, its effect on their attitude and subsequent effect on decision making of investors in identified.

3. Research methodology

Methods of sampling: In order to assess the hypothesised correlations between the constructs in a model, this study employs a quantitative method and a cross-sectional design.

The researcher employed convenience sampling technique, purposefully selecting samples based on the importance of their viewpoints regarding the specific topic. This technique is a form of non-probability sampling. Collecting information from investors through social connections was a convenient way. The required information was obtained through a well-organized questionnaire. It was distributed to students, business professionals, and retail investors. A total of 540 surveys were distributed to investors using both online and offline channels. 489 were being received. Financial literacy, knowledge, behaviour, and investment decision-making are the specific areas of focus of the study. The primary purpose of this research is to examine how Saudi citizens' level of financial literacy influences their choices when it comes to making investments. It also aims to find out what characteristics contribute the most to financial literacy when it comes to investing choices.

Measurement scale: Structured equation modelling, which included path analysis and factor analysis, was used to examine the research model and test the hypotheses that were supplied. Using a Likert scale from 1 to 5, where 1 signifies strong disagreement and 5 signifies strong agreement, the comments were assessed. To better communicate and use simpler language in the specific context of Saudi Arabia, certain statements were changed.

An initial evaluation of the instrument was conducted with a small sample size of 50 individuals to determine the reliability of the questionnaire. In addition to checking for reliability, the pilot study helped find areas where the final survey needed some tweaking. The questionnaire was deemed suitable for the final analysis after its reliability was assessed using the Cronbach Alpha and Item correlation correction technique, after the evaluation of judgmental validity.

Data collection and sample: The sample for this study consists of individuals who possess undergraduate, graduate, postgraduate, and professional degrees from different states in Saudi Arabia. The survey was distributed to 540 participants through both physical copies and online platforms, specifically Google forums, using a non-probability convenience sampling method. From the 540 responses that were received, a smaller group of 489 responses was selected to be included in the study in order to make it easier to process the data. The data was collected throughout a six-month duration, spanning from July to December 2023. The determination of sample size for non-probability sampling does not follow specific criteria. Instead, it typically relies on numerous designated approaches, including basic principles offered by different researchers, as well as budgetary restraints (Minhaj et al., 2024). The sample size for this study is obtained using the adopted methodology of structural equation modeling (SEM).

Estimation methods: EFA, CFA, and SEM (structural equation modelling) are the three approaches used in the study. Ruscio and Roche (2012) suggest performing Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) in situations where there is insufficient prior knowledge for constructing a theoretical model. Cronbach's Alpha was used to assess the reliability of the questions. The most essential criterion is validity, which indicates how effectively an instrument measures what it is meant to assess. We also applied KMO and Bartlett's Test for sampling adequacy. Although the current research model lacks prior information of structural evolution, it is presumed that an exploratory factor analysis (EFA) should be performed before proceeding to a confirmatory factor analysis (CFA). As a result, the study uses an exploratory factor analysis (EFA) to probe the conceptual model's foundational structure. The next step is to conduct a Confirmatory Factor Analysis (CFA) to assess the model's "reliability and validity" and ascertain the research model's goodness of fit indices.

4. Finding and analysis's

Two parts make up the evaluation; together, they have 32 questions. The first half of the research looked at the participants' demographics; the second half broke down the participants' financial literacy, financial behaviour, financial understanding, and investment decision into five indicators. The data collected from the participants was assessed using a "rating scale," a simplified manner. Out of the 505 responses received, a subset of 489 responses was chosen for inclusion in the study in order to facilitate data processing. To do a quantitative analysis of the data. The software SmartPLS 3 was utilized in the study. This section presents the findings and outcomes derived from the conducted research.

4.1. Background information of the respondents

The people who filled out the surveys are shown in this section as a sample. **Table 1** provides a summary of the results according to the demographic characteristics used in the investigations. Primary sources were used to compile the data that is displayed here.

Table 1. Baseline data of the participants ($N = 489$).

Basis	Categories	F	%
Gender	M	302	61.75
	F	187	38.25
Age Group	Up to 18 years	64	13.08
	19–30 years	120	24.53
	31–40 years	154	31.49
	41 and above	151	30.87
Educational Qualification	U. G	78	15.95
	G	131	26.78
	P. G	156	31.90
	P. D. H	124	25.35
Occupational Status	Govt. Employees	94	19.22
	Private. Employees	143	29.24
	Business and self. Employees	167	34.15
	Students	85	17.38
Monthly Income	≤ Rs 10,000	67	13.70
	Rs 10,000–Rs 20,000	148	30.26
	Rs 20,001–Rs 40,000	173	35.37
	> Rs 40,000	101	20.65

Table 1 presents an overview of the participants' demographic characteristics, encompassing variables such as gender, age group, educational attainment, job status, and monthly income, among other relevant details. The data indicates that the sample respondents were predominantly male, comprising 61.75 percent of the total, while females represented the remaining 38.25 percent of respondents. According to the findings of the survey, a significant proportion of participants (31.49 percent) fell within the age range of 31 to 40 years. Additionally, 24.53 percent of respondents were aged between 19 and 30, while 30.87 percent were above the age of 41. Furthermore, 13.08 percent of individuals surveyed were in the age bracket up to 18 years old.

After completing their studies, 15.95 percent of the participants identified themselves as Undergraduate (U. G), 26.78 percent as Graduation (G), 31.90 percent as Postgraduate (P. G), and 25.35 percent as individuals with a professional degree (PDH). The participants are categorized into four distinct categories according to their occupational situation: individuals employed by the government (19.22 percent), individuals employed in the private sector (29.24 percent), individuals engaged in business or self-employment (34.15 percent), and students (17.38 percent).

In relation to monthly income, the findings indicate that 13.70 percent of the participants own incomes below Rs 10,000, while 30.26 percent have incomes ranging from Rs 10,000 to 20,000. Additionally, 35.37 percent of the respondent's report incomes falling within the range of Rs 20,000 to 40,000, and 20.65 percent of the participants have incomes exceeding Rs 40,000.

4.2. Measurement model evaluation

The measuring model was confirmed using "internal consistency, convergent validity, and discriminant validity".

Financial literacy, financial behaviour, financial knowledge, and investment choice are the latent constructs used in the study, and they are represented by the circles in **Figure 1**. Along with the arrows indicating the various items or constructs, there are three statement codes that assess financial literacy, five that measure financial behaviour, three that measure financial knowledge, and four that measure investment decision. Next to the corresponding arrows for each item or building are the factors loading values.

According to the findings presented in **Table 2**, it can be inferred that a favourable reaction is indicated when the average values of all the elements inside a given construct above a threshold of 3 in financial literacy, financial behaviour, financial knowledge, and investment decision. A five-point "Likert scale," with "Strongly Disagree" (1) and "Strongly Agree" (5) as its values, was employed by the researcher. There are elements in each construct with factor loadings higher than the specified threshold of 0.70. Theoretically posited constructs are explained in detail in each statement.

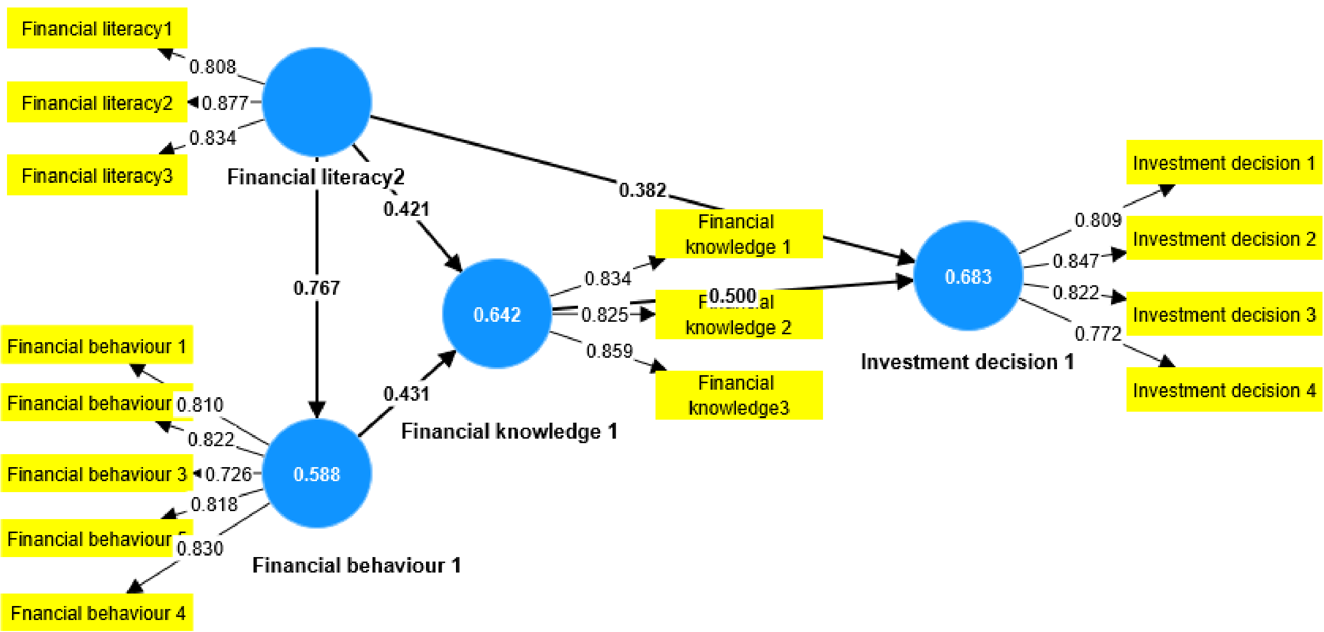

Figure 1. Measurement model from SmartPLS 3.0.

Table 2. Mean, SD and loadings of constructs.

Construct	Item	Mean	SD	Loading
Financial Literacy (FL)	FL1	2.71	0.60	0.80
	FL2	3.01	0.71	0.71
	FL3	2.91	0.69	0.72
Financial Behaviour (FB)	FB1	3.18	0.78	0.78
	FB2	3.61	0.51	0.80
	FB3	4.18	0.79	0.83
	FB4	3.89	0.76	0.71
	FB5	4.01	0.82	0.67
Financial Knowledge (FK)	FK 1	3.11	0.79	0.83
	FK 2	3.09	0.71	0.77
	FK3	3.54	0.82	0.84
Investment Decision (ID)	ID 1	3.43	0.88	0.74
	ID 2	3.89	0.83	0.70
	ID 3	4.00	0.73	0.86
	ID 4	3.09	0.87	0.79

KMO and Bartlett’s Test:

It is possible to compare partially correlated correlation values using the sampling adequacy (KMO) test. With a value of 0.849, KMO is higher than the “cut off value of 0.50,” as shown in **Table 3**. Consequently, the results of the sufficiency test indicate that there are enough correlations between the underlying constructs to proceed with additional investigation (Haider et al., 2024).

Table 3. KMO and Bartlett's test.

KMO Sampling Adequacy		**0.849**
Bartlett's Test of Sphericity	Approx. Chi-Square	70,636.1
	Df	406
	Sig	0.00

Table 4. Convergent validity result.

Factor	Cronbach's Alpha	Rho-A	C. R	A. V. E
Financial Literacy (FL)	0.803	0.791	0.817	0.709
Financial Behaviour (FB)	0.820	0.811	0.914	0.689
Financial Knowledge (FK)	0.756	0.740	0.871	0.643
Investment Decision (ID)	0.876	0.863	0.901	0.690

Considering "Composite Reliability" (C.R.) values over 0.7 and "Average Variance Extracted" (AVE) values over 0.5, all five structures fulfilled the necessary standard limit, as demonstrated in **Table 4** (Ventre and Kolbe, 2020). Significantly higher than 0.7 "Cronbach's Alpha and rho-a" scores demonstrated internal consistency (Adepoju and Adeniji, 2020). Consequently, the concept of "convergent validity" was established (Khanifar et al., 2012).

4.3. Discriminant validity result

Our verification of discriminant validity was conducted using the "Fornell-Larcker and cross-loading criteria." Discriminant validity is the concept that a measure can be "adequately distinguishable from related constructs within the nomological net."

In order to compute the "Fornell-Larcker" criterion, it is necessary to obtain the square roots of the "Average Variance Extracted" values for the relevant constructs, as indicated in **Table 5**. In summary, the values indicate that financial knowledge and investment decision exhibited greater correlations compared to the correlations between each construct and the other constructs (0.855), (0.868), financial literacy (0.831), and financial behaviour (0.809). The establishment of discriminant validity was accomplished through the use of the "Fornell-Larcker" criterion (Fornell and Lacker, 1981).

Table 5. Discriminant validity-Fornell-Larcker criterion.

Factors	Financial literacy (FL)	Financial behaviour (FB)	Financial knowledge (FK)	Investment decision (ID)
Financial Literacy (FL)	**0.831**			
Financial Behaviour (FB)	0.675	**0.809**		
Financial Knowledge (FK)	0.709	0.760	**0.855**	
Investment Decision (ID)	0.771	0.780	0.689	**0.868**

All of the constructions in **Table 6** had loadings that were greater than the cross-loadings with other structures across all columns, according to the cross-loading criterion. To determine discriminant validity, the cross-loading criterion was employed (Henseler et al., 2015).

Table 6. Discriminant validity-loading and cross-loading criterion.

Factor	Financial Literacy (FL)	Financial Behaviour (FB)	Financial Knowledge (FK)	Investment Decision (ID)
FL 1	**0.711**	0.521	0.542	0.515
FL 2	**0.802**	0.602	0.667	0.613
FL 3	**0.791**	0.577	0.561	0.607
FB 1	0.710	**0.793**	0.632	0.701
FB 2	0.688	**0.855**	0.660	0.732
FB 3	0.430	**0.851**	0.509	0.701
FB 4	0.650	**0.798**	0.533	0.632
FB 5	0.722	**0.812**	0.765	0.675
FK 1	0.507	0.696	**0.789**	0.602
FK 2	0.661	0.601	**0.811**	0.721
FK 3	0.700	0.729	**0.845**	0.711
ID 1	0.719	0.701	0.711	**0.792**
ID 2	0.622	0.555	0.659	**0.833**
ID 3	0.611	0.509	0.603	**0.766**
ID 4	0.679	0.667	0.511	**0.801**

4.4. Structural equation model

In the process of analyzing the structural model, it is imperative to account for the presence of multicollinearity, as this factor can significantly impact the reliability of the obtained results. The study conducted by Akinwande et al. (2015) revealed that the "Variance Inflation Factor" (VIF) values ranged from 1.493 to 2.257, suggesting the absence of multi-collinearity in the model. To assess the relevance of the hypothesis, the structural model was subsequently subjected to verification using the bootstrapping method, with 5000 resamples.

Based on the presented PLS-SEM model in **Figure 2**, it is evident that when the t-values surpass the specified threshold of 1.96 for regression weights, each path demonstrates statistical significance at a significance level of 5 percent or higher. This implies that the estimated path parameter holds significance. The results of the structural equation modeling (SEM) model are presented in **Table 7**.

Table 7. Direct impact of AI and ML on Financial services and financial institution.

Hypothesis	Path	*B*	*t*-value	*p*-value	Result
Ho1	Financial literacy→ financial behavior	0.483	4.010	$P \leq 0.001$	Supported
Ho2	Financial literacy → financial knowledge	0.392	4.251	$P \leq 0.005$	Supported
Ho3	Financial literacy → investment decision	0.308	2.117	$P \leq 0.001$	Supported
H04	Financial literacy → financial knowledge	0.351	2.660	$P \leq 0.001$	Supported
H05	Financial knowledge → financial behavior	0.424	4.949	$P \leq 0.005$	Supported
H06	Financial knowledge → investment decision	0.401	2.541	$P \leq 0.005$	Supported

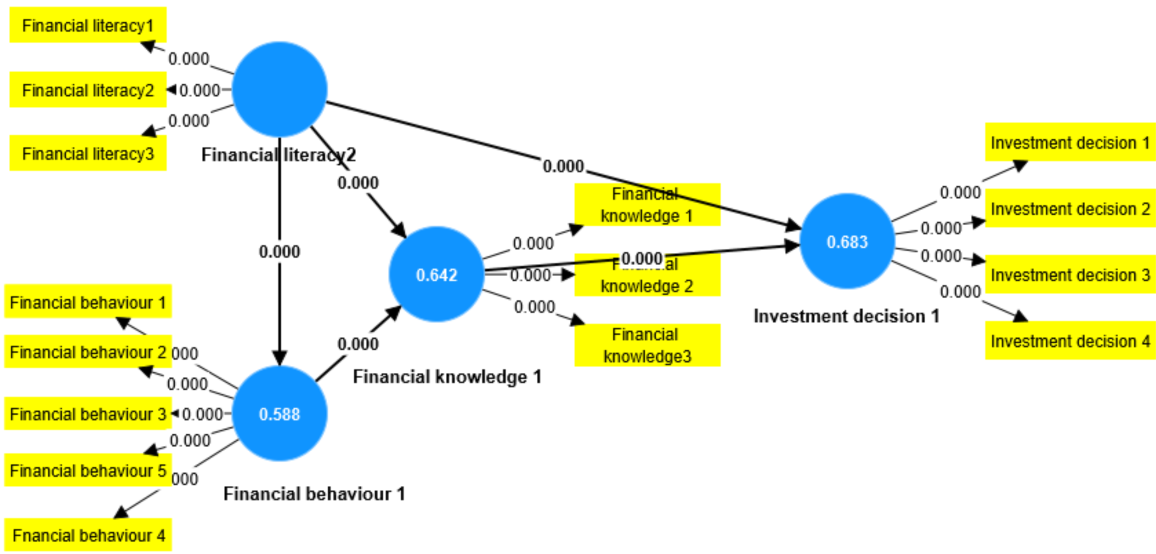

Figure 2. Structural equation model (SEM).

Table 7 shows that hypotheses Ho1, Ho2, Ho3, H04, Ho5 and H06 were supported. Financial literacy is also tangentially and favorably connected to financial behavior ($\beta = 0.483$, t-value = 4.010, and $p < 0.001$). Financial literacy is also directly and positively related to financial knowledge ($\beta = 0.392$, t-value = 4.251, and $p <$ 0.005). Similarly, financial literacy is tangentially and favorably connected to investment decision ($\beta = 0.308$, t-value = 2.117, and $p < 0.001$). Financial literacy is also tangentially and favorably connected to financial knowledge ($\beta = 0.351$, t-value = 2.660, and $p < 0.001$).

Although, financial knowledge is tangentially and favorably connected to the financial behavior (β =0.424, t-value = 4.949, and $p < 0.005$). Similarly, financial knowledge is tangentially and favorably connected to investment decision ($\beta = 0.424$, t-value = 2.541, and p < 0.001).

Table 8 shows that hypotheses H07 and H08 were supported. In terms of FL, financial behaviour has a mediated or indirect effect on investment decision (β = 0.201; t-value = 2.170; $p < 0.005$). In the case of FK, financial behaviour has a mediated or indirect effect on the investment decision ($\beta = 0.189$, t-value = 2.103, and $p < 0.005$).

Table 8. Mediating or indirect impact of satisfaction and hypothesis testing.

Hypothesis	Path	*B*	*t*-value	*p*-value	Result
Ho7	FL → FB→ investment decision	0.201	2.170	$P \leq 0.005$	Supported
Ho8	FK → FB→ investment decision	0.189	2.103	$P \leq 0.005$	Supported

5. Discussion

According to the results, individual investors' investment decisions are greatly and quantifiably impacted by financial literacy and its many components, including knowledge, behaviour, savings, risk-taking, and investment possibilities. The study's findings align with the earlier research conducted by Hamza and Arif (2019), Gallo and Sconti (2023), Thorp et al. (2023) and Raviprolu and Nagavali (2020). The investigation unveiled a robust and significant association between financial literacy, financial understanding, and investing decisions. Moreover, there existed a significant correlation between the financial conduct, knowledge of finance, and investment choices of the investors. The study also established a robust correlation between financial literacy and individual investment choices. The possession of financial expertise enables individuals to make prudent investment choices.

The ability to make sound financial judgments, even in the face of complex financial situations, is a hallmark of financial literacy. Reason being, those with a firm grasp of money matters are better able to make informed investment selections, reducing the likelihood of costly blunders and increasing the likelihood of success. The maximization of investors' financial well-being is supported. Individual Saudi Arabian investors' investment decisions were the focus of this study, which aimed to examine the impact of financial literacy, financial behavior, and financial understanding.

It is evident from the research that a financial literacy level is positively related to financial knowledge. As such, financial literacy counselling centres /classes are desperately needed by Saudi, particularly those who are financially distressed. Financial literacy and knowledge in finance will be helpful to guarantee that financial services are accessible and available to the entire population in order to alleviate poverty, decrease social injustice, and promote long-term growth with proper investment schemes.

People with insufficient knowledge in finance are more likely to behave illogically; they are more probable to make rash financial decisions. Their financial attitudes may lead to be the victims of fraudulent or unethical. So, more awareness programs should be conducted by the govt. to educate the people in this direction. As evidenced by studies, financial behaviour and knowledge are favorably connected with Investment Intention. As a result, good money management skills should be taught to these individuals in order to assist them in building good investment strategies.

Implications of the study: In order to mitigate losses during trades and ensure that investors make informed financial decisions, it is imperative for individuals to acquire knowledge regarding the correlation between financial literacy, financial behavior, and investment decision-making. Furthermore, diverse regulatory bodies can aid investors in mitigating financial losses by furnishing them with ample knowledge and financial literacy. This research assists in identifying the specific areas that require focus in order to offer appropriate strategies and suggestions for enhancing financial literacy and financial awareness. Finally, this study can assist diverse educational institutions in comprehending how individuals' views and behavior change in varied environments. This research assists in identifying the specific locations to focus on for courses and training programs designed for investors, as well as the specific demographic groups that should be targeted to enhance financial literacy.

The results of the study highlight the usefulness and acceptability of financial literacy in decision-making processes, demonstrating their significance. Every entity, from NGOs to high-level government agencies, has to make a financial decision. Organizations should be prepared to allocate resources to develop financial literacy skills as needed. This would promote the implementation of well-thought-out judgments and decrease the occurrence of unfavorable consequences resulting from investment decisions.

Future research and limitation: By promoting financial literacy and advocating for its study, investors can significantly enhance their decision-making abilities about investments. Therefore, it is necessary to conduct a thorough examination of how investors make everyday investment decisions, including the process of decision-making. To make investment decisions, it is advisable to employ the technique of "multi-criteria analysis" to assess and classify investment options. Nevertheless, it is necessary to analyze the role of individual information normalization in investment and draw optimal conclusions for the decision-making process. Furthermore, investors must analyze and evaluate all the factors in the market instead of solely focusing on a single factor. Creating a diversified portfolio is essential for investors. They should include shares from different industries and firms to minimize risk. Investors and corporations should prioritize the development and improvement of their financial literacy and expertise, as higher financial literacy is directly correlated with making effective investment decisions.

It was initially not possible to generalise the results to the whole population because the study used a small sample size. Also included in the sample were individual Saudi Arabian investors. Raising the sample size and making it more representative should be the top priorities of future research. Other qualitative methods of data collection for gauging investors' financial literacy could be investigated in future studies. Despite investors' better understanding of the question, they may provide an answer that they believe is desired instead of their genuine goal. Therefore, observational research is advised because it can shed light on financial literacy and investing choices more thoroughly.

6. Conclusion

Examining how individual investors' level of financial literacy affects their investment choices is the primary goal. The study shows that individual investors' investment selections are positively and significantly correlated with their level of financial literacy. Three crucial factors of financial literacy that affect the relationship are knowledge, behavior, and attitude towards finances. The investigation demonstrates a significant and positive association between financial literacy and the investing decisions made by individual investors. Three crucial factors of financial literacy that affect the relationship are knowledge, behavior, and attitude towards finances. In addition, the survey reveals that individual investors possess a greater degree of familiarity with bank savings and insurance as opposed to stocks and bonds. The survey reveals that investors have a limited understanding of mutual funds and unit trusts, indicating a need for increased awareness and development in knowledge about financial products. Financial literacy is a crucial ability for making logical financial decisions in complex financial situations.

New goods, services, and processes are constantly appearing in the ever-expanding financial industry. These goods and services can help consumers and investors better their financial situation. In particular, financial literacy helps people become more knowledgeable about and comfortable using various financial goods and services. In a country like Saudi Arabia, where there is a significant amount of cultural variety, varying living levels, and several languages, achieving a consistent understanding of financial products is a formidable challenge. Individuals must carefully assess their needs and subsequently allocate investments to meet those needs.

Assuring complete financial security and thriving through difficult financial times. An investor's financial well-being can be optimised when they are financially literate since they are more likely to understand and make educated decisions and choices, which helps them avoid major mistakes, minimise losses, and maximise their financial decisions. So, in pursuit of higher returns, investors work to improve their behaviour and knowledge to make better operational and future investment decisions. To help people become better investors and to encourage them to use their money wisely, the government, lawmakers, and financial institutions should host seminars and workshops to educate the public on money management. In the long run, this will cause more people to want complex financial products.

Financial institutions should improve their promotional techniques due to the growing complexity of investment selections for individual investors, caused by the wide variety of financial products offered on the market. However, market participants are aware of their limited knowledge and literacy, and they attempt to make changes in order to imitate and reproduce consecutive facts and investigations. However, these alterations yield successful consequences and subsequently lead to an accurate, efficient, and correct investing strategy. Ultimately, investors have the option to base their judgments on anticipated profits rather than anticipated losses.

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References

Abdullah, H., & Tursoy, T. (2023). The Effect of Corporate Governance on Financial Performance: Evidence from a Shareholder-Oriented System. Iranian Journal of Management Studies, 16(1), 79–95. https://doi.org/10.22059/IJMS.2022.321510.674798

Adepoju, A., & Adeniji, A. (2020). Technology Acceptance of E-Banking Services in an Unnatural Environment. SEISENSE Journal of Management, 3(3), 34–50. https://doi.org/10.33215/sjom.v3i3.336

Afshar, P. F., Foroughan, M., Vedadhir, A. A., & Tabatabaei, M. G. (2017). The effects of place attachment on social well-being in older adults. Educational Gerontology, 43(1), 45–51. https://doi.org/10.1080/03601277.2016.1260910

Akims, M. A., & Jagongo, A. (2017). Financial Literacy and its Impact on Investment Decisions in Nigeria: A Theoretical Perspective. International Journal of Scientific Research and Innovative Technology, 4(11), 2313–3759.

Akinwande, M. O., Dikko, H. G., & Samson, A. (2015). Variance Inflation Factor: As a Condition for the Inclusion of Suppressor Variable(s) in Regression Analysis. Open Journal of Statistics, 05(07), 754–767. https://doi.org/10.4236/ojs.2015.57075

Amisi, S. (2012). The Effect of Financial Literacy on Investment Decision Making by Pension Fund Managers in Kenya; Unpublished Article. pp. 1–74.

Andriani, N., Jamil, P. C., & Yulyanti, S. (2023). Financial Literacy and Investment Decisions in Islamic Financial Products. Jurnal Apresiasi Ekonomi, 11(2), 322–328. https://doi.org/10.31846/jae.v11i2.635

Ansar, S., Klapper, L., & Singer, D. (2023). The importance of financial education for the effective use of formal financial services. Journal of Financial Literacy and Wellbeing, 1(1), 28–46. https://doi.org/10.1017/flw.2023.5

Arianti, B. F. (2018). the Influence of Financial Literacy, Financial Behavior and Income on Investment Decision. EAJ (Economic and Accounting Journal), 1(1), 1–10. https://doi.org/10.32493/eaj.v1i1.y2018.p1-10

Arshad Khan, M., & Alhumoudi, H. A. (2022). Performance of E-Banking and the Mediating Effect of Customer Satisfaction: A Structural Equation Model Approach. Sustainability, 14(12), 7224. https://doi.org/10.3390/SU14127224

Atmaningrum, S., Kanto, D. S., & Kisman, Z. (2021). Investment Decisions: The Results of Knowledge, Income, and Self-Control. Journal of Economics and Business, 4(1). https://doi.org/10.31014/aior.1992.04.01.324

Awais, M., Fahad Laber, M., Rasheed, N., & Khursheed, A. (2016). International Journal of Economics and Financial Issues Impact of Financial Literacy and Investment Experience on Risk Tolerance and Investment Decisions: Empirical Evidence from Pakistan. International Journal of Economics and Financial Issues, 6(1), 73–79.

Ayaa, M. M., Peprah, W. K., Mensah, M. O., et al. (2022). Influence of Heuristic Techniques and Biases in Investment Decision-Making: A Conceptual Analysis and Directions for Future Research. International Journal of Academic Research in Business and Social Sciences, 12(5). https://doi.org/10.6007/ijarbss/v12-i5/13339

Çera, G., Khan, K. A., Rowland, Z., & Ribeiro, H. N. R. (2021). Financial Advice, Literacy, Inclusion and Risk Tolerance: the Moderating Effect of Uncertainty Avoidance. E a M: Ekonomie a Management, 24(4), 105–123. https://doi.org/10.15240/tul/001/2021-4-007

Choinière-Crèvecoeur, I., & Michaud, P. C. (2023). Reverse mortgages and financial literacy. Journal of Financial Literacy and Wellbeing, 1(1), 79–102. https://doi.org/10.1017/flw.2023.4

Clarke, S. (2017). A Prospect Theory Approach to Understanding Conservatism. Philosophia (United States), 45(2), 551–568. https://doi.org/10.1007/s11406-017-9845-9

D.A.T., K., Azam S. M., F., & Khalidah, S. (2020). The Impact of Financial Literacy on Women's Economic Empowerment in Developing Countries: A Study Among the Rural Poor Women in Sri Lanka. Asian Social Science, 16(2), 31. https://doi.org/10.5539/ass.v16n2p31

D.A.T, K. (2020). The Impact of Financial Literacy on Investment Decisions: With Special Reference to Undergraduates in Western Province, Sri Lanka. Asian Journal of Contemporary Education, 4(2), 110–126. https://doi.org/10.18488/journal.137.2020.42.110.126

Danila, N., Shahwan, Y., Ali, Z., & Djalaluddin, A. (2019). The linkages between financial literacy and its application in financial decision-making among academicians in Indonesia. Humanities and Social Sciences Reviews, 7(5), 1280–1292. https://doi.org/10.18510/hssr.2019.75167

Fornell, & Lacker. (1981). Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion. Journal of Physics: Conference Series PAPER, 890(1), 1–6.

Fornero, E., & Lo Prete, A. (2023). Financial education: From better personal finance to improved citizenship. Journal of Financial Literacy and Wellbeing, 1(1), 12–27. https://doi.org/10.1017/flw.2023.7

Frisancho, V. (2023). Spillover effects of financial education: The impact of school-based programs on parents. Journal of Financial Literacy and Wellbeing, 1(1), 138–153. https://doi.org/10.1017/flw.2023.2

Gallo, G., & Sconti, A. (2023). How much financial literacy matters? A simulation of potential influences on inequality levels. Available online: https://www.econstor.eu/handle/10419/270895%0Ahttps://www.econstor.eu/bitstream/10419/270895/1/GLO-DP-1266.pdf (accessed on 27 March 2024).

Gerrans, P., Abisekaraj, S. B., & Liu, Z. (2023). The fear of missing out on cryptocurrency and stock investments: Direct and indirect effects of financial literacy and risk tolerance. Journal of Financial Literacy and Wellbeing, 1(1), 103–137. https://doi.org/10.1017/flw.2023.6

Gisbert-Pérez, J., Martí-Vilar, M., & González-Sala, F. (2022). Prospect Theory: A Bibliometric and Systematic Review in the Categories of Psychology in Web of Science. Healthcare (Switzerland), 10(10). https://doi.org/10.3390/healthcare10102098

Gurung, G., Shah, R., & Jaiswal, D. P. (2020). Software Development Life Cycle Models—A Comparative Study. International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 2021, 30–37. https://doi.org/10.32628/cseit206410

Haider, A., Khan, M. A., Khoja, M., et al. (2024). The role of e-banking, mobile-banking, and e-wallet with response to e-payment and customer trust as a mediating factor using a structural equation modelling approach. Journal of Infrastructure, Policy and Development, 8(9). https://doi.org/10.24294/jipd.v8i9.6644

Hamza, N., & Arif, I. (2019). Impact of Financial Literacy on Investment Decisions: The Mediating Effect of Big-Five Personality Traits Model. Market Forces Research Journal, 14(1), 43–60.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Ising, A. (2007). Pompian, M. (2006): Behavioral Finance and Wealth Management—How to Build Optimal Portfolios That Account for Investor Biases. Financial Markets and Portfolio Management, 21(4), 491–492. https://doi.org/10.1007/s11408-007-0065-3

Janor, H., Yakob, R., Hashim, N. A., et al. (2016). Financial literacy and investment decision in Malaysia and UK—Comparitive Study. Malaysian Journal of Society and Space, 2(2), 106–118.

Jappelli, T., & Padula, M. (2013). Investment in financial literacy and saving decisions. Journal of Banking and Finance, 37(8), 2779–2792. https://doi.org/10.1016/j.jbankfin.2013.03.019

Kefela, G. (2011). Implications of financial literacy in developing countries. African Journal of Business Management, 5(9), 3699–3705. https://doi.org/10.5897/AJBM09.297

Khan, M. A., Alakkas, A. A., Khojah, M., et al. (2023). Corporate Social Responsibility and Corporate Brand Awareness: An Interface in the Kingdom of Saudi Arabia. International Journal of Professional Business Review, 8(11), e03824. https://doi.org/10.26668/businessreview/2023.v8i11.3824

Khan, M. A., Alhathal, F., Alam, S., & Minhaj, S. M. (2023). Importance of Social Networking Sites and Determining Its Impact on Brand Image and Online Shopping: An Empirical Study. Sustainability, 15(6), 5129. https://doi.org/10.3390/su15065129

Khan, M. A., & Minhaj, S. M. (2021). Performance of online banking and direct effect of service quality on consumer retention and credibility of consumer and mediation effect of consumer satisfaction. International Journal of Business Information Systems, 1(1), 1. https://doi.org/10.1504/IJBIS.2021.10043829

Khan, M. A., & Minhaj, S. M. (2022). Dimensions of E-Banking and the mediating role of customer satisfaction: a structural equation model approach. International Journal of Business Innovation and Research, 1(1), 1. https://doi.org/10.1504/IJBIR.2022.10045447

Khan, M. A., Roy, P., Siddiqui, S., & Alakkas, A. A. (2021). Systemic Risk Assessment: Aggregated and Disaggregated Analysis on Selected Indian Banks. Complexity, 2021. https://doi.org/10.1155/2021/8360778

Khan, M. A., Vivek, Minhaj, S. M., et al. (2023). Impact of Store Design and Atmosphere on Shoppers' Purchase Decisions: An Empirical Study with Special Reference to Delhi-NCR. Sustainability (Switzerland), 15(1). https://doi.org/10.3390/su15010095

Khanifar, H., Molavi, Z., Jandaghi, G. R., & Niya, M. J. M. (2012). Factors influencing the intendancy of e-banking: An integration of TAM & TPB with eservice quality. Journal of Applied Sciences Research, 8(3), 1842–1852.

Kim, J. E., & Moen, P. (2001). Is retirement good or bad for subjective well-being? Current Directions in Psychological Science, 10(3), 83–86. https://doi.org/10.1111/1467-8721.00121

Kim, J. E., & Moen, P. (2002). Retirement transitions, gender, and psychological well-being: A life-course, ecological model. Journals of Gerontology - Series B Psychological Sciences and Social Sciences, 57(3), 212–222. https://doi.org/10.1093/geronb/57.3.P212

Kyeremeh, K. (2019). Overview of System Development Life Cycle Models. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3448536

Lusardi, A. (2019). Financial literacy and the need for financial education: evidence and implications. Swiss Journal of Economics and Statistics, 155(1), 1–8. https://doi.org/10.1186/s41937-019-0027-5

Lusardi, A., & Messy, F. A. (2023). The importance of financial literacy and its impact on financial wellbeing. Journal of Financial Literacy and Wellbeing, 1(1), 1–11. https://doi.org/10.1017/flw.2023.8

Lusardi, A., & Mitchell, O. (2011). Financial literacy around the world—Annamaria Lusardi and Olivia S. Mitchell. Nber, 17(4), 1–14.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. Journal of Economic Literature, 52(1), 5–44. https://doi.org/10.1257/jel.52.1.5

Maheria, S. D. (2023). a Theoretical Study of Financial Literacy in India. Gap Interdisciplinarities—A Global Journal of Interdisciplinary Studies, 6(3), 86–90. https://doi.org/10.47968/gapin.630013

Markowitz, H. M. (2009). Foundations of portfolio theory. Harry Markowitz: Selected Works, 46(2), 481–490. https://doi.org/10.2307/2328831

Minhaj, S. M., Rehman, A., Das, A. K., et al. (2024). Investor sentiment and the function of blockchain technology in relation to digital currencies: The here and now and the future. Educational Administration: Theory and Practice, 30(5), 7777–7791. https://doi.org/10.53555/kuey.v30i5.3942

Mohammed, A. A., Alam, W., Haque, S., & Akhtar, A. (2023). Impact And Significance of CRM in Rural Banking -A Comprehensive Study. AMA, Agricultural Mechanization in Asia, Africa and Latin America, February.

Morris, T., Maillet, S., & Koffi, V. (2022). Financial knowledge, financial confidence and learning capacity on financial behavior: a Canadian study. Cogent Social Sciences, 8(1). https://doi.org/10.1080/23311886.2021.1996919

Musundi, K. M. (2014). The Effects of Financial Literacy on Personal Investment Decisions in Real Estate in Nairobi County; Unpublished Article.

Oppong, C., Salifu Atchulo, A., Akwaa-Sekyi, E. K., et al. (2023). Financial literacy, investment and personal financial management nexus: Empirical evidence on private sector employees. Cogent Business and Management, 10(2). https://doi.org/10.1080/23311975.2023.2229106

Raviprolu, A., & Nagavali, P. (2020). A Study on Financial Literacy among College PG Students in Visakhapatnam City. Asian Journal of Management, 11(1), 43. https://doi.org/10.5958/2321-5763.2020.00008.6

Richardson, V., & Kilty, K. M. (1991). Adjustment to retirement: Continuity vs. discontinuity. International Journal of Aging and Human Development, 33(2), 151–169. https://doi.org/10.2190/6RPT-U8GN-VUCV-P0TU

Saima, & Khan, M. A. (2020). Effect of Social Media Influencer Marketing on Consumers' Purchase Intention and the Mediating Role of Credibility. Journal of Promotion Management, 27(4), 503–523. https://doi.org/10.1080/10496491.2020.1851847

Siddiqui, M. S., Siddiqui, U. A., Khan, M. A., et al. (2021). Creating Electronic Word of Mouth Credibility through Social Networking Sites and Determining Its Impact on Brand Image and Online Purchase Intentions in India. 1008–1024.

Singh, I., & Gupta, K. (2021). The Impact of Financial Literacy on Investor Attitudes and Decision-Making: an Empirical Analysis. Journal of General Management Research, 8(2), 47–57.

Thorp, S., Liu, J., Agnew, J., et al. (2023). Feeling comfortable with a mortgage: The impact of framing, financial literacy and advice. Journal of Financial Literacy and Wellbeing, 1(1), 47–78. https://doi.org/10.1017/flw.2023.3

Ventre, I., & Kolbe, D. (2020). The Impact of Perceived Usefulness of Online Reviews, Trust and Perceived Risk on Online Purchase Intention in Emerging Markets: A Mexican Perspective. Journal of International Consumer Marketing, 32(4), 287–299. https://doi.org/10.1080/08961530.2020.1712293