

Are Generation-Z Investors Ready for Sustainable Finance? The Impact of Financial Literacy on ESG Investment Intention in Pakistan

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Abstract

The primary objective of the study is to examine how financial literacy shapes governance practices and investment decisions among Pakistani Generation Z regarding environmental and social norms. In this relationship, financial confidence and risk tolerance were taken as the mediating variables. Primary data were gathered using a Google Forms survey targeting Generation Z investors in Pakistan who have at least a month of stock market experience, execute at least 1 trade per month, and are conversant with ESG financial tools. The current research study used 401 valid responses. A non-convenient sample was used in the study, and the snowball sampling technique was used for the collection of data by using a well-structured questionnaire based on the existing scales. Partial least squares structural equation modeling was investigated using the SmartPLS program. The study results showed that financial literacy had a significant positive impact on the intention to make investments in the field of environmental, social, and governance (ESG) ($\beta = 0.435$, $p < 0.001$). Financial confidence and risk tolerance were mediating variables; their combined positive influence on willingness to invest in ESG was ($\beta = 0.403$, $p < 0.001$) and ($\beta = 0.275$, $p < 0.001$), respectively. The overall advantageous impact on financial confidence ($\beta = 0.358$, $p < 0.001$) and risk tolerance ($\beta = 0.614$, $p < 0.001$) was positive with financial literacy. The linkages between ESG investment and financial literacy using financial confidence were ($\beta = 0.144$, $p < 0.001$), and using risk tolerance were ($\beta = 0.169$, $p < 0.001$). The model described 66.3% of the variance in the ESG investment decisions ($R^2 = 0.663$). Additionally, this study contributes to the creation of an insight into the most pertinent factors influencing Gen-Z ESG investing intentions in Pakistan. It is one of the few works providing an understanding of sustainable finance in the emergent market and serves as a guideline to policymakers, financial organizations, and scholars who are interested in encouraging young people to invest in the Pakistan Stock Exchange through ESG.

Keywords: Financial literacy (FL); financial confidence (FC); risk tolerance (RT); ESG investment intention; sustainable finance; Generation Z; Pakistan stock exchange.

JEL Classification: G41, D14

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1. Introduction

Investing in assets that consider social, governance, and environmental aspects in addition to financial returns and the incentive to create long-term value that will benefit investors and society at large is referred to as sustainable investment. Economic transformation in Pakistan has faced significant challenges in recent years. The population of Pakistan has surpassed 255 million and is ranked as number five most populous country in the world. However, financial literacy seems to be at a very low level, and it stands at only 26 percent of the population. Pakistan ranks 16th among 26 countries with the lowest levels of financial literacy, with the majority of its population lacking awareness of financial products and their applications (OECD/INFE, 2023). The majority of the Pakistani population lacks knowledge of money management, budgeting, and investment and savings. To create awareness on financial literacy among the people of Pakistan, the State Bank of Pakistan initiated on January 20, 2012 The National Financial Literacy Initiative (NFLP). The program will enable behavioural change toward financial literacy, including saving more, managing debt, and reducing perceived financial stress. Later, the National Financial Literacy Program-Youth and the NBP will cooperate with the National Institute of Banking and Finance to instill vital financial literacy in Pakistani teenagers and adolescents in schools as a strategy of empowering them to manage their finances, save, plan, budget, and handle their finances (SBP, 2023).

Gen Z is considered to include those who have birth dates between the year 1995 and 2012. It is the first generation of the Pakistani population that has been raised with computers, and the eldest member of the generation will be 31 years old by 2026. Pakistan already has millions of individuals within the Gen Z population, which is a good segment of the future investor base. Gen Z has been brought up in another world where massive corporate mansions dominate them and dynamic innovations. Technologies are too sophisticated to the extent that all the amenities are at their fingertips. The main objective of this research is to investigate how prioritizing ESG factors influences Gen Z's attitudes toward ESG investing and their investment intentions, and subsequently, how these variables impact sustainable investment decision-making. Using risk tolerance and financial confidence as key mediating factors, the study will attempt to evaluate how financial literacy drives ESG investing decisions. Previous research conducted in Pakistan's surroundings has gathered samples of registered individual Pakistan Stock Exchange (PSX) investors and identified that financial risk tolerance (FRT) acted like a mediator between financial literacy (FL) and investing-based behaviour of decision-making (Ahmed et al., 2021). Yet the role of research on financial literacy on ESG investing decisions under the confounding influence of financial confidence and risk tolerance, especially among Gen Z investors in the Pakistani Stock Exchange. Sustainable finance has gained momentum in the Pakistan Stock Exchange (PSX), which has numerous businesses currently producing sustainability reports, and the SECP is also providing an ESG disclosure guideline document. Nonetheless, young investors are not involved in ESG-based investments to a large extent, which is why this study is timely and meaningful.

2. Literature Review

2.1 Theoretical Framework

2.1.1 *Self-Efficacy Theory*

The self-efficacy theory introduced by Bandura (1977) is the paradigm on which this study is based. According to the theory, beliefs of the people concerning their ability to perform behaviors necessary in achieving certain performance outcomes have a strong effect on their motivation, cognition, and consequent behavior. Based on this theoretical framework, we predict that Generation Z investors will be more likely to make sustainable ESG investments if they think they can comprehend and be competent in the financial markets. According to the Self-efficacy Theory, self-efficacy is a conviction that an individual has to proactively undertake the agreed steps in order to achieve the goals. Since it can support the confidence of an individual, self-efficacy stands out as one of the most salient predictors of behavioral performance. In the framework of ESG investments, self-efficacy determines the approach of Generation Z investors towards sustainable financial instruments and the choices that are made according to the deeply held values.

2.1.2 *Theory of Planned Behavior*

The theory of planned behavior (TPB) is additionally employed in this research to look at the intentions of individuals about ESG investment and to explore Pakistani Generation Z investors. Ancestor research on investment intention or practice has implemented major use of the TPB model. The theory claims that intention is the proximate antecedent of the behavior of an individual, and intention is also balanced by three vital elements, including subjective values, attitude, and perceived behavioral control. The present research investigation examines financial literacy and realistic ESG decisions when making investments have financial confidence and risk tolerance as important mediating variables. Ajzen and Fishbein stated the terms of attitude and subjective norms as factors influencing the tendency of an individual to act in a specific way (Ajzen & Fishbein, 1980). Within the context of sustainable investing, the deliberate nature of an individual to exercise a particular alternative, to a significant degree, depends on his/her perception and affective conditions, which, in turn, become modified to various social and cultural settings. Since Pakistan has a multi-ethnic cultural background and different levels of social norms, it is possible to assume that the behavioral patterns of the Pakistani Generation Z investors can differ significantly in relation to their Western counterparts.

2.2 Environmental, Social, and Governance (ESG) Investments

The pandemic brought a seismic shift in social interactions, and the field of finance is one of them, representing a turning point concerning investing practices related to ESG. ESG investment

strategies measure both the ESG scores of any firm and the traditional financial performance (Keeley et al., 2022). Socially responsible investing (SRI) is the basis of ESG investing; It has originated in the civil rights movement and the increased emphasis on social responsibility in the 1960s. Modern literature agrees that investment decisions should be made based on ESG. The empirical research indicates that financial performance and the material importance of ESG dimensions have a positive relationship over very large cohorts of companies. The ESG rankings and ratings, therefore, become key instruments of investors seeking sustainable investment returns (Asvathitanont & Tangjitprom, 2020). In Pakistan, the Pakistan Stock Exchange has created a special section of companies with high ESG ratings, and many companies have embarked on the release of sustainability reports. Additionally, the ESG disclosure guidelines have been promulgated by SECP, and thus, an environment favoring sustainable investments has been created.

2.3 Financial Literacy

Several scholars, as well as financial literacy has been defined in numerous contexts by organizations. According to the Presidential Advisory Council (PAC) on Financial Literacy, financial literacy is “the management of financial resources to achieve lifetime wellness of people using knowledge and skills” in 2008. This term is the most frequently utilized. The literature has numerous definitions of financial literacy; these include prudent financial behavior, financial expertise, perceived expertise, abilities, and the capacity to apply financial knowledge and experience. According to Lusardi and Mitchell (2014), financial literacy is what is understood to be about the foundations of finance, the variations between diversification’s nominal and true values, which are defined in terms of the concept of interest compounding and basic risks (Lusardi et al., 2018). Over the past few years, sustainable investments have grown tremendously, and GSI Alliance states their number has increased by 15 per cent in the past two years Global Sustainable Investment Alliance, 2022).

Sconti and Fernandez (2023) found that about 40% of Singaporeans had a higher level of financial literacy. Comparison of the people with higher literacy of finance and the people with high knowledge of ESG, it was established that people who have an in-depth understanding of ESG also know a lot about finance and thus have a positive relationship. Comparably Sticha (2023) observed a substantial relationship as positive between investment activity and financial literacy, as well as how they affect the rapid growth of wealth and financial stability in accordance with Dupuy et al. (2024), that people’s financial literacy differs greatly depending on several factors, including age, gender, family influence, and educational attainment, and that awareness of issues related to ESG and how they affect financial decision-making is a prerequisite for a sustainable financial culture. Recent studies highlight that young investors’ decisions about sustainable investments are greatly influenced by ESG awareness (Dupuy et al., 2024; Verma et al., 2025).

In his research, Raut (2020) said that the mindset of investors is subject to complicated variables, such as uncertainty, risk, and having too many choices. Financial literacy will be critical in such a situation. When an investor has the ability to be financially literate, they can better position themselves in relation to their investment risk based on the indicators they receive and their ability to manage it.

Based on the literature, the following hypothesis is proposed:

H1: Financial Literacy has a positive effect on ESG Investment.

2.4 Financial Confidence

Self-belief to arrive at prudent financial choices is recognized as the financial confidence construct. The source of financial confidence is financial knowledge and exerts a short-term but significant impact on financial decision-making (Chandra et al., 2022). Similarly, financial confidence has an equivalent significance to the other factors; people without financial confidence are unable to make wise financial judgments (Aristei et al., 2021; Respati et al., 2023). Aristei and Gallo (2022) talk about how self-assurance and financial literacy affect one's preference for financially responsible businesses, sustainable debt behavior, and personal investment decisions. According to their results, overconfident people tend to enter into financial transactions, suffer financial losses because of investment fraud, and have excessive debt. Rudianto et al. (2024) established that companies that have high ESG scores will have a better financial performance, stable dividend payouts, and attract more investors.

Paranita et al. (2025) indicate that ESG considerations are becoming central to investment decisions and have impacts on corporate governance, sustainability reports, and financial performance; thus, improved transparency and disclosure of full ESG reports build investor trust. Deng (2024) questions that investors consider the disclosures of firms in terms of their clarity, openness, veracity, and accountability, and the presence of high-quality ESG statements allows companies to perform better. Pratiwi and Edeh (2024) present evidence that indicates that transparent ESG reporting enhances the value of a company over the long term, minimizes capital spending, and increases investor confidence. In the Theory of Planned Behavior, intention is the most salient predictor of behavior of an individual and attitude is the leading antecedent of intentions (Norman et al., 2019). Akhtar and Das (2019) argued that attitudes can be used as either a negative or a favorable foundation for upcoming actions or behaviors that may be pleasurable or rewarding. According to O'Connor and White (2010), someone else is more inclined to set up a positive intent to carry out a specific behavior if they have a favorable attitude toward it.

Based on the aforementioned research, the following hypothesis is proposed:

H2: Financial Confidence has a positive effect on ESG Investment.

2.5 Financial Risk Tolerance

Financial risk tolerance (FRT) affects individual investors and financial institutions in the sense that the risk tolerance is characterized as the readiness to conduct activities where the outcome is unknown and there is the likelihood of some kind of identifiable unfavorable consequences (Hermansson & Jonsson, 2021). Even though every investor has a unique risk tolerance level, the degree of the same has a certain effect on investment returns. An empirical study has consistently demonstrated that financial literacy has prominent and basic factor that influences the capacity of the general population for making responsible financial decisions (Mouna & Anis, 2017; Thomas and Spataro, 2018). Furthermore, poor financial decisions and the inability to make timely decisions have been reported to indicate a lack of financial literacy. Positive market gains, in particular, tend to have a considerable impact on investor sentiment (George & Srinivasa Suresh, 2018). By exploring Indonesian investors' behavior, Rusdianti (2024) presented an in-depth overview of the complicated relationships among risk tolerance, financial literacy, and sustainable investment practices.

Simanullang and Simanullang (2025) explored how green finance affects the ESG performance of the Indonesian publicly traded companies and found that it has substantial positive relationships with the use of green financial instruments. Sutejo et al. (2024) used risk tolerance as an intermediary measure to assess the impact of positive as well as unsavory emotions through the COVID-19 pandemic while deciding on financial decisions. The study's findings revealed that the relationship between favorable feelings and making investment options is mitigated by financial risk tolerance. The relationship of financial literacy as a mediating variable was studied by Mohta and Shunmugasundaram (2024), and RTL and intention to make high-risk investments. Findings demonstrated that the desire for investing in risky derivatives is both positively and significantly impacted by risk tolerance.

Based on the above literature, the following hypothesis is proposed:

H3: Financial Risk Tolerance (FRT) has a positive effect on ESG Investment.

2.6 Financial Literacy and Financial Confidence

A key aspect of financial confidence is financial literacy. Adults with higher levels of financial literacy are more likely to say they are confident in the capacity they have to make prudent investments. In the realms of sustainable investing, the financially literate generation will be better placed to understand the complicated concepts of ESG reporting, critically analyze company sustainability reports, and determine the long-term consequences of their investment decisions. This enhanced perception is converted into increased confidence in making ESG-compliant investment decisions. According to Sajid et al. (2024), individuals who are more knowledgeable about finances showcase more responsible financial norms, particularly debt management,

investing, and saving, since they feel more confident about their financial capabilities. This fact correlates with the previous theoretical models that claim that declarative financial knowledge should be supplemented with self-efficacy beliefs in order to be converted into successful financial behavior.

The effectiveness of educating people's consciousness of their financial confidence was examined in a study by Lee et al. (2025), which found that improvements in this area substantially improve performance in the financial literacy test and investment activities, particularly among those who lack confidence. Likewise, Bucher-Koenen et al. (2024) showed that confidence is a dynamic element that decides how information about finances can be articulated and used, rather than only a byproduct of literacy. This body of research reveals that confidence performs an important function in evaluations of financial literacy and its performance. Furthermore, the findings are supported by Curry (2025), as the relationship between FL and mental health is represented through fundamental structural equations. Contrary to the broad pattern of financial strength (financial resilience), emotional wellness and financial literacy are part of a mediated relationship by gender-specific levels of confidence. These research investigations suggest that financial confidence is advantageously affected by financial literacy. Its major impact, how the government implements financial education programs and outreach efforts.

Based on the above reasoning, the following hypothesis is proposed:

H4: Financial Literacy has a positive effect on Financial Confidence.

2.7 Financial Literacy (FL) and Risk Tolerance (RT)

The notion that financial risk tolerance is substantially raised by financial literacy is confirmed by existing empirical data on the subject. Individuals who are more knowledgeable about finances are more prepared to take financial risks, especially in an investing environment, according to research conducted in a variety of geographic and demographic contexts. Using a sample of 450 active investors in the Uzbek capital market, Kholikov (2025) stated a positive, statistically significant association between financial literacy (FL) and risk-taking behavior; multivariate regression analyses further showed financial literacy was a significant element of risk tolerance. It is crucial in order to recall that investors who were placed in the high-risk sector achieved the greatest mean returns, which suggests that increased literacy helps in making more informed risk assessment and may improve returns. Phung (2025) confirmed the aforementioned results in a study of Vietnamese undergraduates and graduates, indicating a positive relationship between risk-taking behavior as well as financial literacy, in particular, deliberate utilization of debt to enter the stock market. These results show that those who are financially literate comprehend risk instruments proactively.

In addition, Sutejo (2025) investigated Indonesian Generation-Z investors' attitudes

toward financial literacy and proved that financial literacy worked through System 2 cognitive processes to determine portfolio trading decisions; risk tolerance turned out to be a considerable partial mediator between financial knowledge and risk preference. The favorable association between literacy and risk tolerance is further explained by the use of behavioral models and systematic reviews that have multidimensional elements of literacy and intervening variables. Ocansey and Manu (2025) discovered in a systematized literature review combining 45 empirical investigations that risk tolerance is a critical moderating element. It demonstrates its vital function in the decision-making procedure through modifying the relationship between financial behavior and financial literacy.

Basis of reasoning, the following hypothesis is proposed:

H5: Financial Literacy has a positive effect on Financial Risk Tolerance.

2.8 Financial Confidence as a Mediator

An essential phase in transitioning financial literacy into real-world investment action is financial confidence. The knowledge in itself is not enough, and people must simultaneously believe in their ability to put this knowledge into practice. Confidence, according to empirical studies in behavioral finance, has always been a mediator. For instance, Coskun and Dalziel (2020) evaluated if financial attitude intensifies the association between financial behavior and financial literacy, and concluded that monetary attitude modulates the relationship. Inversely, Bucher-Koenen et al. (2025) indicate that retail investors must confront significant challenges to sustainable investment, which can be related to a limited understanding of sustainable financial products and financial incapacity.

In accordance with Dupuy et al. (2024), to make appropriate sustainable investments, ordinary financial literacy should be complemented by sustainable finance literacy, which refers to awareness of ESG issues and their financial significance. Senaya (2024) presents substantial evidence to support the premise that (FL) financial literacy and sustainable investing behavior are positively and statistically significantly correlated, implying that those who have higher levels of financial literacy are more capable of making ESG-friendly investing decisions. Additionally, Janssen and Zhang (2025) establish that using the ESG rating in investment decision-making is strongly associated with sustainable finance literacy and perceived reliability of these rating which implies that informed investors are in a stronger position to use the opportunities and challenges of sustainable investing. Sari et al. (2025) confirm that getting financially literate is necessary for the process of sustainable investment in their systematic literature review, which forecasts the years 2015 to 2024 and is used in relationships with risk perceptions and attitudes towards sustainability.

Based on this reasoning, the following hypothesis is proposed:

H6: Financial Confidence mediates the relationship between Financial Literacy and ESG Investment.

2.9 Risk Tolerance as a Mediator

Another approach to financial investing decisions is facilitated by literacy, through risk tolerance. A greater degree of financial literacy affects the risk tolerance and, in turn, of their investment decisions because they have a more comprehensive grasp of risk-return trade-offs, diversification strengths, and longer investment horizons. Financial literacy influences sustainable investment behaviors through a two-way interaction with psychological attributes and risk perception, according to Verma et al. (2025). This implies that financial education fosters inclusion through changing how risk is perceived. This correlation is supported by D'Hondt et al. (2021), who use survey and transaction data to show the synergistic influence of risk tolerance (RT) and financial literacy (FL) of the portfolio exposure on retail investors' stock to ESG factors, thus providing solid empirical evidence of the joint determination of sustainable investment outcomes by the two variables.

A similar Approach to explain the importance of psychological variables like risk tolerance as a transmission mechanism of making financial decisions is exhibited by Khalid and Riaz (2025) evidence, which demonstrates that, in the Pakistani context, risk perception significantly impacts the association between cognitive biases and investment decisions. The researchers noted that good practices, kin, and associates can greatly influence personal goals; however, financial literacy provides the much-needed cognitive framework to risk appraisal (Shanmugham & Ramya, 2012). The mediation role of risk tolerance (RTL) between FL and investment decisions has been demonstrated in a variety of research studies (Ahmed et al., 2021; Kasoga, 2021).

Based on this reasoning, the aforementioned hypothesis is proposed:

H7: Financial Risk Tolerance mediates the relationship between Financial Literacy and ESG Investment.

2.10 Conceptual Framework

The independent variable portrayed in Figure 1 is financial literacy, ESG investment is the dependent variable, and the mediating variables are financial confidence and risk tolerance.

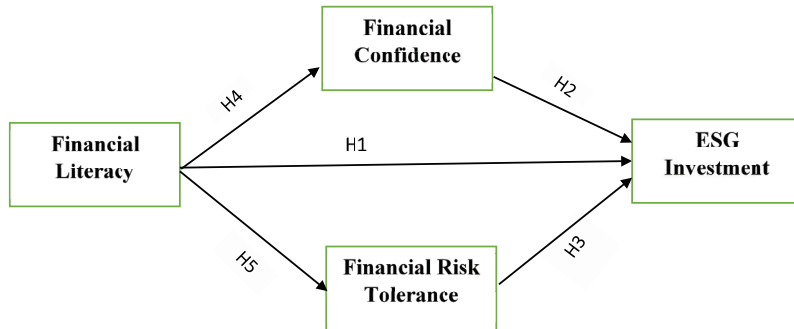


Figure 1: Conceptual Framework

3. Research Methodology

Using a well-structured questionnaire for the collection of the data, the researcher utilized a non-probability convenience sampling method. The views of the respondents were examined via a five-point Likert scale ranging from strongly disagree to strongly agree. A non-probability convenience sampling method was used to find respondents, and then snowball sampling was used researchers' acquaintances in major Pakistani cities (Karachi, Lahore, Islamabad, Multan, and Faisalabad), as well as members of Generation Z, were given the questionnaire (those born between 1995 and 2012) who had a minimum background knowledge of, or were interested in, securities investment. The respondents were then asked to spread the instrument to their respective social networks in their respective cities, hence increasing the scope of data collection through snowball sampling. The acquisition of data was done electronically through Google Forms. There were 401 responses obtained. The sample size complies with PLS-SEM standards, where statistical power analysis and the 10-times rule are employed to determine a minimum sample (Hair et al., 2022). The respondent rate of nearly 89% was achieved through the distribution of 450 questionnaires, from which 401 responses were collected as valid. PLS-SEM was selected because it meets requirements for analysis of sophisticated models having latent constructs and predict-oriented research (Hair et al., 2017; 2022). This particular program was determined for the current research because it may be quite adaptable, particularly when dealing with complex models. Confirmatory composite analysis was used to test the linear relationship between composite constructs.

3.1 Instrument Adaptation

The questionnaire was developed by adapting scales from previous literature:

| Construct | Source | Items |
|--------------------------|--|-------|
| Financial Literacy | Chen and Volpe (1998), Van Rooij et al. (2011) | 5 |
| Financial Confidence | Respati et al. (2023) | 4 |
| Financial Risk Tolerance | Pinjisakikool (2018) | 5 |
| ESG Investment | Karmacharya (2023) | 10 |

4. Analysis Results

4.1 Demographic Profile

Table 1
Demographic Characteristics of the Respondents

| Demographic Factors | Frequency | Percent | Cumulative Percent |
|-----------------------------------|-----------|---------|--------------------|
| Gender | | | |
| Male | 237 | 59.1 | 59.1 |
| Female | 164 | 40.9 | 100 |
| Total | 401 | 100 | |
| Age | | | |
| Under 18 | 11 | 2.7 | 2.7 |
| 18 – 21 | 113 | 28.2 | 30.9 |
| 22 – 25 | 277 | 69.1 | 100 |
| Total | 401 | 100 | |
| Educational Level | | | |
| High school or less | 11 | 2.7 | 2.7 |
| Senior secondary school | 18 | 4.5 | 7.2 |
| College graduate | 260 | 64.8 | 72 |
| Advanced degree | 107 | 26.7 | 98.7 |
| Other | 5 | 1.3 | 100 |
| Total | 401 | 100 | |
| Experience of Stock Market | | | |
| Less than 1 year | 152 | 37.9 | 37.9 |
| 1-3 years | 178 | 44.4 | 82.3 |
| 4-6 years | 52 | 13 | 95.3 |
| More than 6 years | 19 | 4.7 | 100 |
| Total | 401 | 100 | |

Table 1: A significant number of respondents are between the ages of 18 and 25, which is in line with the description of Generation Z. 237 participants (59.1%) and 164 participants (40.9%) were male and female, respectively, out of a sample of 401 respondents. The highest share of respondents was comprised of persons in the age range of 22-25 years (69.1%), and then the people in the 18-21 years category (28.2%). Most of the respondents were college graduates (64.8%), then there were the majority of those with college degrees (64.8%). The most prevalent range of experience in terms of stock-market experience was 1-3 years of experience (44.4%), followed by a subgroup whose experience is less than one year (37.9%).

4.2 Reliability Analysis

Table 2

Reliability Results of Measurement (n = 50)

| Variables | No. of Items | Cronbach's Alpha |
|--------------------------|--------------|------------------|
| Financial Literacy | 5 | 0.888 |
| Financial Confidence | 4 | 0.862 |
| Financial Risk Tolerance | 5 | 0.880 |
| ESG Investment | 10 | 0.897 |

The Cronbach alpha value was used for evaluating the questionnaire's reliability. Fifty respondents got involved in a pilot survey. The coefficients obtained were in Table 2, and they all had a higher value than the predetermined cut-off of 0.7, which confirms the reliability of the instrument to be used in a survey environment (Morgan et al., 2004).

4.3 Confirmatory Composite Analysis

Table 3
Confirmatory Composite Analysis

| Constructs and Variables | Codes | Factor Loadings | Composite Reliability | Average Variance Extracted |
|--|-------|-----------------|-----------------------|----------------------------|
| Financial Literacy (FL) | | | 0.913 | 0.777 |
| I have a good understanding of investment. | FL1 | 0.785 | | |
| I am knowledgeable enough about investment instruments/tools. | FL2 | 0.887 | | |
| I have an adequate understanding of market trends. | FL3 | 0.882 | | |
| I feel that my stock market knowledge and expertise will enable me to outperform the market. | FL4 | 0.746 | | |
| I understand well the relationship between risk and return. | FL5 | 0.785 | | |
| Financial Confidence (FC) | | | 0.896 | 0.684 |
| I am too confident in my ability to make investment decisions. | FC1 | 0.838 | | |
| I believe to achieve my financial goals through investing. | FC2 | 0.898 | | |
| I feel sure about my judgments regarding investment opportunities. | FC3 | 0.802 | | |
| I trust my financial knowledge when making investment choices. | FC4 | 0.823 | | |
| Financial Risk Tolerance (FRT) | | | 0.899 | 0.747 |
| I am willing to take risks when investing. | FRT1 | 0.852 | | |
| I can tolerate potential losses for higher returns. | FRT2 | 0.903 | | |
| I prefer investments with higher risk for potentially higher returns. | FRT3 | 0.837 | | |
| I am comfortable with volatility in my investment portfolio. | FRT4 | 0.812 | | |
| I understand that higher returns require accepting higher risk. | FRT5 | 0.840 | | |
| ESG Investment (ESG) | | | 0.854 | 0.662 |
| I intend for investing in companies that care about climate change. | ESG1 | 0.881 | | |
| I will encourage others to invest in socially responsible companies. | ESG2 | 0.856 | | |
| I plan to make ESG investments in the near future. | ESG3 | 0.907 | | |
| I prefer companies with strong environmental practices. | ESG4 | 0.812 | | |
| I consider social responsibility when making investment decisions. | ESG5 | 0.798 | | |
| I value good corporate governance in my investment choices. | ESG6 | 0.784 | | |
| I am willing to invest in companies with high ESG ratings. | ESG7 | 0.821 | | |
| I believe ESG investments can provide competitive returns. | ESG8 | 0.776 | | |
| I research companies' ESG performance before investing. | ESG9 | 0.745 | | |
| I think sustainable investing is important for the future. | ESG10 | 0.803 | | |

The findings of the confirmatory composite analysis showed in Table 3, suggest that each of the constructs is reliable, coherent, and consistent with the measurement model. Most of the loadings of the factors are over the minimum required of 0.70. The composite reliability (CR) has exceeded the 0.70 threshold, hence validating the theoretical connectivity between all constructs. Each of the constructs acquires a value greater than the desired value of 0.50, based on analysis of the AVE, confirming that the level of variance that construct captures is greater than the amount of variance that can be attributed to measurement error.

4.3.1 Multicollinearity

| Construct | VIF Values |
|-----------|------------|
| FL | 2.1 |
| FC | 2.35 |
| FRT | 2.5 |

There are no multicollinearity issues because all VIF values are below 5.

4.4 Construct Reliability and Validity

Table 4
Construct Reliability and Validity

| Construct | Cronbach's Alpha | Composite Reliability (rho_a) | Composite Reliability (rho_c) | Average Variance Extracted (AVE) |
|--------------------------|------------------|-------------------------------|-------------------------------|----------------------------------|
| ESG Investment | 0.854 | 0.856 | 0.887 | 0.662 |
| Financial Confidence | 0.862 | 0.864 | 0.896 | 0.684 |
| Financial Literacy | 0.888 | 0.891 | 0.913 | 0.777 |
| Financial Risk Tolerance | 0.88 | 0.883 | 0.899 | 0.747 |

Table 4 contains validity and its reliability metrics. All Cronbach alpha values of the constructs are greater than the 0.70 threshold, with ESG Investment having the lowest Cronbach alpha at 0.854 and Financial Literacy having the highest at 0.888, demonstrating good internal consistency. Composite reliability ratings are greater than 0.70, and the related rho c values range from 0.887 (ESG Investment) to 0.913 (Financial Literacy). The scores of all AVE are higher than the recommended level of 0.50, which also implies good convergent validity.

4.5 Discriminant Validity

Table 5
Fornell-Larcker Criterion

| | ESG Investment | Financial Confidence | Financial Literacy | Financial Risk Tolerance |
|---------------------------------|----------------|----------------------|--------------------|--------------------------|
| ESG Investment | 0.814 | | | |
| Financial Confidence | 0.727 | 0.827 | | |
| Financial Literacy | 0.756 | 0.763 | 0.881 | |
| Financial Risk Tolerance | 0.805 | 0.77 | 0.807 | 0.864 |

In accordance with Table 5’s analysis results, each of construct, AVE square root is larger than all cross-construct correlation values, highlighting the discriminant validity (Fornell and Larcker, 1981). This suggests that the related investigation’s final analysis can be completed.

4.6 Measurement and Structural Model Assessment

The said technique was used to test the structural model after verifying the validity and reliability of the constructs. Figure 1 represents the outcomes of the PLS algorithm analysis and presents the R2 for endogenous variables, the path coefficients (β) between the constructs, and the factor loadings associated with each item.

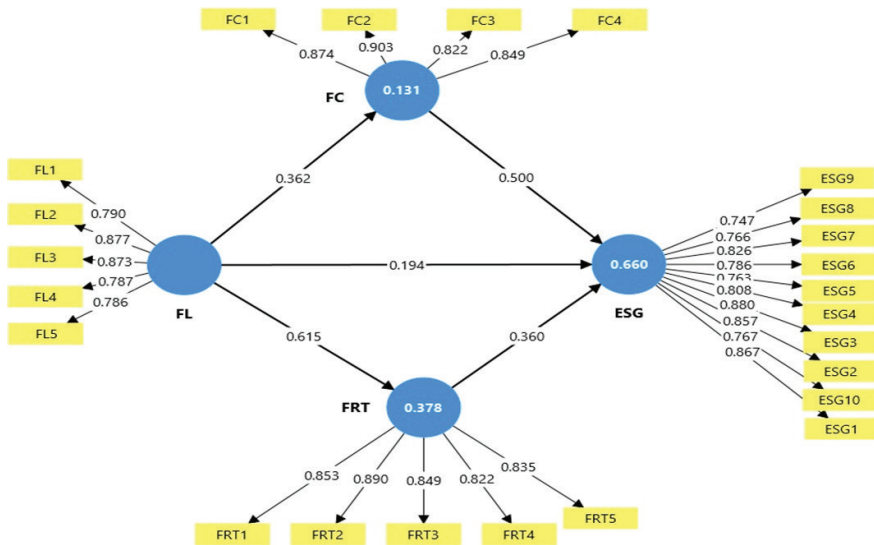


Figure 2: PLS Algorithm Results

All the factor loading is above 0.70, which is considered the recommended factor loading, and hence, item reliability is verified. The estimated path coefficients show how the variables are directly related; an example of the direct relationships is the effect of FL on ESG Investment, which is 0.121. Also, the model accounts for a significant 66.3 percent of the variation in the ESG Investment decisions ($R^2 = 0.663$). A bootstrapping study of 5,000 in order to find out the statistical significance of these standardized paths and recognize the proposed linkages, resamples were carried out. The bootstrapping analysis, which consists of the t-statistics of each path, is illustrated in Figure 3.

Path Coefficients and Significance (Bootstrapping) : Scarred Bootstrapping

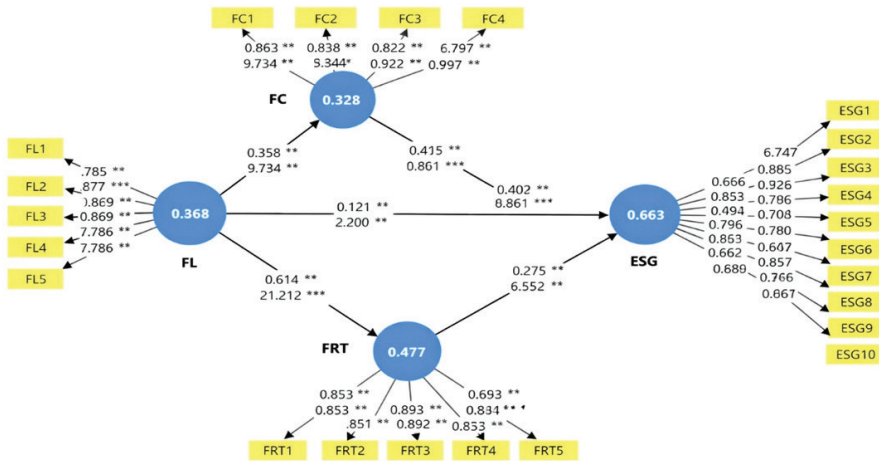


Figure 3: Bootstrapping Results

Because the t-statistics are substantially larger than their threshold value of 1.96 at 5% level of significance, the bootstrapping tables confirm that each path is statistically significant. As an example, when risk tolerance is the DV and financial literacy is the IV, the t-value is 14.619 ($p < 0.001$). The detailed overview of its path coefficients with the level of significance of each of them, and the following tables indicating the results of hypothesis testing.

4.7 Structural Model and Path Analysis

Table 6
Path Coefficients and Hypothesis Testing

| Hypothesis | Path | Mean (M) | Standard Deviation | T-Stats | p-Value | Result |
|------------|------------|----------|--------------------|---------|---------|-----------|
| H1 | FL--> ESG | 0.121 | 0.041 | 2.951 | 0.003 | Supported |
| H2 | FC --> ESG | 0.405 | 0.058 | 6.948 | 0.000 | Supported |
| H3 | FRT--> ESG | 0.277 | 0.052 | 5.288 | 0.000 | Supported |
| H4 | F- -> FC | 0.360 | 0.055 | 6.509 | 0.000 | Supported |
| H5 | FL-->FRT | 0.615 | 0.042 | 14.619 | 0.000 | Supported |

Table 7
Standardized Direct, Indirect, and Total Effects

| Independent Variables → Dependent Variables | Direct Effects | Indirect Effects | Total Effects |
|---|----------------|------------------|---------------|
| Financial Literacy → Financial Confidence | 0.358 | - | 0.358 |
| Financial Literacy → Risk Tolerance | 0.614 | - | 0.614 |
| Financial Literacy → ESG Investment | 0.121 | 0.314 | 0.435 |
| Financial Confidence → ESG Investment | 0.403 | - | 0.403 |
| Risk Tolerance → ESG Investment | 0.275 | - | 0.275 |

Note: All effects are significant at $p < 0.01$.

Table 8
Specific Indirect Effects

| Specific Indirect Effects | Coefficient | T-Stats | p-Value |
|--|--------------|--------------|--------------|
| Financial Literacy → Financial Confidence → ESG Investment | 0.144 | 4.823 | 0.000 |
| Financial Literacy → Risk Tolerance → ESG Investment | 0.169 | 5.107 | 0.000 |
| Total Indirect Effect | 0.314 | 7.856 | 0.000 |

Considering both direct and indirect impacts, the overall influence of financial literacy on ESG Investment is ($\beta = 0.435$, $p < 0.001$). ESG investing is significantly affected by financial knowledge ($\beta = 0.121$, $p = 0.00001$) and an indirect impact via intermediaries ($\beta = 0.314$, $p = 0.000001$).

ESG investment is significantly impacted by financial confidence ($\beta = 0.403$, $p < 0.001$), and financial confidence is positively impacted by financial literacy ($\beta = 0.358$, $p < 0.001$). Furthermore, financial literacy has a significant impact on risk tolerance ($\beta = 0.614$, $p < 0.001$), and risk tolerance has a significant positive effect on ESG investment ($\beta = 0.275$, $p < 0.001$).

The mediating effects are proven by specific indirect effects: the indirect effect of FL on ESG investment by financial ($\beta = 0.144$, $p < 0.001$) and (RTL) risk tolerance ($\beta = 0.169$, $p < 0.001$). These findings are too supportive of H6 and H7.

Table 9
Hypotheses Testing Results Summary

| Hypothesis | Path | β | t-value | p-value | Result |
|------------|---|---------|---------|---------|-----------|
| H1 | Financial Literacy → ESG Investment | 0.435 | 10.607 | 0 | Supported |
| H2 | Financial Confidence → ESG Investment | 0.403 | 6.948 | 0 | Supported |
| H3 | Risk Tolerance → ESG Investment | 0.275 | 5.288 | 0 | Supported |
| H4 | Financial Literacy → Financial Confidence | 0.358 | 6.509 | 0 | Supported |
| H5 | Financial Literacy → Risk Tolerance | 0.614 | 14.619 | 0 | Supported |
| H6 | Financial Literacy → FC → ESG (Indirect) | 0.144 | 4.823 | 0 | Supported |
| H7 | Financial Literacy → FRT → ESG (Indirect) | 0.169 | 5.107 | 0 | Supported |

4.8 Model Fitness

Table 10
R² and Q² Values

| Constructs | R ² | R ² Adjusted | Q ² |
|--------------------------|----------------|-------------------------|----------------|
| ESG Investment | 0.663 | 0.661 | 0.645 |
| Financial Confidence | 0.328 | 0.326 | 0.312 |
| Financial Risk Tolerance | 0.477 | 0.475 | 0.458 |

This model explains 66.3% of the variance in ESG investment decisions, 32.8% in financial confidence, and 47.7% in risk tolerance, according to the coefficient of determination (R²) values. According to Hair et al. (2017), the related model has strong predictive relevance because of all constructs have Q² values that are significantly more than zero.

5. Conclusion

This study demonstrates how significant financial literacy is in influencing Pakistani Generation Z investors' aspirations to make ESG investments. Findings demonstrate that financial literacy affects ESG investing through risk tolerance and financial confidence, both directly and indirectly. Four constructs were investigated: the dependent variable was ESG investment, the mediators were financial confidence and risk tolerance, and the independent variable was financial literacy. There is a positive influence of FL on the intention of ESG investment, which was the most extensive one ($\beta = 0.435$). This observation is consistent with the past literature by Raut (2020) and Sconti and Fernandez (2023), who described that financially literate people have a higher chance of venturing into stock markets and making sound investments. Within the framework of sustainable investing, financial literacy helps Gen Z investors to interpret difficult ESG terms, analyze sustainability reporting, and value their long-term capacity to value the creation of value by responsible companies.

The mediating variables were financial confidence and risk tolerance, which positively affected ESG investment intention by a total of ($\beta = 0.403$) and ($\beta = 0.275$). These results corroborate those of Aristei and Gallo (2022) and Hermansson and Jonsson (2021), who focused on the significance of confidence and risk perception in investment behavior. Financial confidence is an individual judgment of his / her confidence regarding his / her capacity to make a competent investment choice, which is especially crucial in the novel and intricate sphere of ESG investing.

Risk tolerance, in its turn, is a willingness to take the risks inherent in sustainable investments, which could have other risk-reward characteristics than conventional investments.

The overall positive impacts of financial literacy upon risk tolerance as well as on financial confidence were ($\beta = 0.614$) and ($\beta = 0.358$), accordingly. These outcomes reveal that confidence and risk perception are based on information. Better knowledge and comprehension of market workings, risk-return trade-offs, and diversification advantages by financially literate Gen Z investors leads them to have increased confidence in their choices and builds risk tolerance. This result can be corroborated with the self-efficacy theory by Bandura (1977); accordingly, experiences of knowledge and mastery are related to confidence in one's possible abilities.

The identified indirect impacts show that financial literacy affects the ESG investment in two different channels. The indirect impact of financial confidence ($\beta = 0.144$) implies that knowledge is converted into confidence, which facilitates action. The indirect effect via risk tolerance ($\beta = 0.169$) shows that financially literate investors gain a more detailed perception of risk and become less hesitant to think about ESG investments despite their perceived uncertainties.

5.1 Research Implications

By integrating TPB with BFT to explain sustainable investment behavior in an emerging market environment, the current study contributes to the existing knowledge. The findings illustrate that financial literacy (FL) is a basic mental construct that influences investors' perceptions of risk and financial confidence, which in turn influences their inclination to invest in ESG-related assets. The research also finds that financial confidence and financial risk tolerance are critical mediation processes existing between financial literacy and ESG investing choices. This assists in explaining how financial knowledge is transformed into real investment intentions, bridging the gap in behavioral finance between knowledge of financial concepts and their realization in real investment behavior.

The practical implications of the findings for the various stakeholders in the Pakistani financial system are also presented. The results reveal that financial education and educational programs need to be enhanced to include ESG investment and sustainable finance issues for regional policymakers and regulators, including the SBP and the SECP, in collaboration. It would be better if financial institutions and investment firms could encourage ESG investment is to gain more confidence in investors through training programs, investment simulations, and mentorship programs that would increase the level of practical experience. To attract future investors, business and economics curricula in educational institutions must incorporate sustainable finance and ESG investment. Financial advisors are additionally obliged to review their clients' financial literacy and provide recommendations on how ESG variables affect long-term risks and returns. Last but not least, Gen Z investors themselves ought to be given an opportunity to constantly enhance their understanding of financial matters, gain practical experience, and ultimately develop confidence in ESG decisions regarding investments.

5.2 Limitations of the Study

There are some limitations that may be considered in this study. It exclusively contained the participants belonging to the Generation Z generation, who had access to the internet and could complete online questionnaires, which could have narrowed the scope of the external validity of the findings, as it might exclude respondents in rural areas or with lower socioeconomic status. Moreover, financial literacy, financial confidence, risk tolerance, and ESG investment intentions were examined using self-reported measures, which are vulnerable to social desirability bias or the tendency of respondents to overstate their skills. It used a cross-sectional approach, which eliminates the potential of drawing firm conclusions about causal processes or behavioral changes with the passage of time since the data had been collected simultaneously. Further, the current study failed to look at actual ESG investment activities, but in the context of the, investment intentions are demonstrated to be significant predictors of behavior. Last but not least, moderating factors such as gender, income level, and religious affiliation were not considered, although they may have significant effects on ESG investment choices, particularly in Pakistan's heterogeneous cultural and socioeconomic context.

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