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## Financial Literacy and Investment Decisions: Evidence from Pakistan

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### ABSTRACT

**Purpose:** This study investigates the key factors associated with financial literacy and examines the effect of financial literacy on investment decisions in Pakistan.

**Design/Methodology/Approach:** The 504 samples were collected via a self-administered questionnaire. The study adopts both OLS and logistic regression techniques to analyze the data.

**Findings:** The findings show that the significant factors which increase financial literacy are father education, father income and marital status. However, guardian occupation decreases financial literacy level. Additionally, the results show that financial literacy can enhance investment decisions.

**Originality/Value:** This study is important to policymakers who can consider these statistically significant factors in efforts to enhance financial literacy as well as investment decisions in Pakistan.

### KEYWORDS

Financial Literacy,  
Investment Decisions,  
Pakistan

### JEL

### CLASSIFICATION

E22, G11, G53

## I. Introduction

The need for financial skills has intensified, worldwide, especially since the recent financial crisis (Douissa, 2020). The development of new financial products through fintech, the complexity of financial markets, and changes in political, socio-demographic, and economic factors, among other influences, have highlighted the importance of improving financial literacy (Al-Tamimi & Bin Kalli, 2009; Douissa, 2020). Furthermore, numerous international aid projects now include elements of personal financial education as part of their efforts to enhance economic prosperity (Lopus et al., 2019). In this climate, financial literacy has become a topic of interest among academics, policymakers, and regulators, especially in developing countries (Karakurum-Ozdemir

et al., 2019; Douissa, 2020; Lopus et al., 2019).

Developing nations experience major challenges in relation to enhancing economic growth and development, poverty alleviation, expansion of financial systems, and financial services. These countries also find it difficult to offer more accessible financial products to adults (Van et al., 2021). Ali et al., (2015) argue that financial literacy is a significant determinant of financial satisfaction as it helps individuals to plan their spending and savings. Lopus et al., (2019) assert that financial literacy is significantly associated with improved worker productivity, decreased absenteeism, and entrepreneurial success. Gallery et al., (2011) provide evidence that financial literacy has a significant impact on pension investment

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decisions. Therefore, financial literacy is an important attribute not only to enhance personal wealth, but also to improve the stability of a nation.

According to a recent report of the Global Financial Literacy Excellence Center, financial literacy rates differ enormously between the major advanced countries and emerging economies in the world. According to Goyal and Kumar (2021), the difference relates to socio-demographic factors including education, financial capability, financial well-being, financial behavior, household finance and retirement planning systems. According to the Global Financial Literacy Survey Report, the financial literacy of adults in Pakistan is around 26% while it is about 70% in developed countries such as Denmark, Sweden, Australia, Germany and the UK (Klapper, Lusardi & Van Oudheusden, 2015). The extant literature has argued that the need for good financial decision making has become increasingly important (Potrich, Vieira & Mendes-Da-Silva, 2016; Lusardi, 2019). Financial literacy is therefore of particular importance for individuals in emerging economies (Xu & Zia, 2013; Grohmann, 2018).

In response to the acknowledged need for enhanced financial literacy in developing countries, this study aims to extend research in this area by investigating how financial literacy may affect investment decisions in Pakistan as an emerging economy. Within South Asia, Pakistan is the third ranked country in terms of low financial literacy scores where the lowest scoring country is Nepal (Klapper, Lusardi, & Oudheusden, 2021). The increasing demand for finance in the industrial sector justifies the need for financial literacy in a developing country like Pakistan. Prior literature suggest that financial literacy improves investor performance. Abreu and Mendes, (2010) argue that financial literacy significantly contributes to more a diverse portfolio. It is argued that people with sound financial knowledge are more rational in their behavior, trade regularly and are less likely to

sell successful stocks while holding on to losing stocks. Another feature of the behavior of financially literate investors is that they tend to work with a relatively small portfolio. Their trading behavior habits will be more likely to lead to higher returns.

Recently, Raut (2020) provided evidence that investment-decisions in India are significantly linked with individuals' financial literacy. Relatedly, the current study identifies the determinants of financial literacy in Pakistan and aims to ascertain the financial literacy levels of people 18 years of age and above. Drawing on this information, this research aims to investigate the ways in which financial literacy can influence investment decisions. It is argued that improving financial literacy in emerging economies like Pakistan will, in turn, increase financial empowerment, opportunities, and status of the market locally and internationally.

According to Goyal and Kumar (2021), a number of previous studies utilize different theories to investigate financial literacy, such as the theory of planned behavior (Ajzen, 1991), theory of consumer socialisation (Moschis, 1987) and social learning theory (Bandura, 1986). While signaling theory has been applied to explain situations in large firms listed on the stock market, this theory has not been widely adopted to explain the relationship between financial literacy and investment decisions. Therefore, the current study is designed to contribute fresh insights to knowledge of financial literacy in two main areas. Firstly, the study introduces indicators affecting financial literacy in the context of Pakistan. Although previous studies state various factors impacting the level of financial literacy, the results are still mixed. Secondly, this research examines the effect of financial literacy on investment decisions by adopting signaling theory to discuss this relationship from a financial perspective. There are a number of existing studies that examine financial literacy in Pakistan, such as the work of Rasool and Ullah (2020); Noor, Batool & Arshad (2020);

Khawar and Sarwar (2021). Some current studies investigate if financial literacy acts as a mediator affecting investment decisions and other variables including risk tolerance (Rahies, Khan, Askari, Ali, & Shoukat, 2022) and investment performance (Ahmad & Shah, 2020). However, these studies do not explore the relationship between financial literacy and investment decisions directly. Prior literature suggests that it is impossible to make decisions about complicated investment avenues without adequate financial literacy (Rasool & Ullah, 2020). The next section of this study provides an overview of the related literature and develops the hypotheses. This is followed by an explanation of the research methodology. Following the clarification of the methodology, the empirical findings are presented and the paper finishes with a conclusion and an assessment of the contribution of the research.

## II. Literature Review & Hypotheses Development

Financial literacy is the understanding and knowledge of basic financial concepts and their application that lead to informed financial decision-making (Klapper et al., 2013; Ouachani et al., 2021; Abreu & Mendes, 2010). Santos, Elisabete; Abreu, (2013) argue that individuals with low levels of financial literacy may suffer credit problems due to over-indebtedness. Ali et al., (2015) assert that individuals may not fully utilize their idle money in profitable investment opportunities due to lack of adequate financial literacy, and therefore, this may affect their future planning for their spending and savings to achieve a satisfactory level of financial wellbeing.

Adopting signaling theory, it can be discussed that having financial literacy supports individuals' investment decisions positively as can be observed from their portfolios. These people tend to diversify their portfolio and do not only invest in a single financial instrument. Kajtazi and Moro (2019) found that adding a high volatility

financial instrument, the portfolio performance improves; but this is due more to the increase in returns than the reduction of volatility. Diversification of portfolios results in reduced risk when making an investment decision (Sinha & Yang, 2021). Aggregate stock market risk is the main factor determining excess returns (Campbell, 1996). Therefore, it is important to consider and implement good strategies considering risk and return when making an investment decision. Additionally, financially literate investors seek to get some advice from better-informed advisors while investors with a low level of financial literacy are less likely to consult an advisor (Calcagno and Monticone, 2015). Signaling theory assumes that decision-making bodies are perfectly coherent and wholly utilize all the available information (Li, Ling, Zhang & Wu, 2021). Likewise, there is an assumption that individuals make the best use of their resources after making a choice between spending and savings that is based on classic wealth criteria (Carvalho, Meier & Wang, 2016). This can be seen particularly clearly when death caused by the pandemic affects the decision of investors to sell stock or save money in cash (Tinungki, Robiyanto & Hartono, 2022; Nurcahyono, Hanum & Sukesti, 2021).

The research literature that explores the relationship between financial literacy and investment decisions is recent and relatively limited in the context of emerging economies (Mouna & Anis, 2017). Klapper et al., (2013) argue that the importance of financial literacy was raised during the financial crisis of 2008. Consequently, considerable research on financial literacy has been conducted globally to scrutinize financial literacy in a number of different countries. For example, Al-Tamimi and Bin Kalli, (2009) assessed the financial literacy of individual investors in the UAE who invest in local financial markets, and they found a significant relationship between financial literacy and investment decisions. Gallery et al., (2011) examined the relationship between financial literacy and pension investment decisions,

and they report significant relationship. In another instance, in Portugal, Abreu and Mendes, (2010) employed a survey of individual investors disclosed by the Portuguese Securities Commission, to study the impact of investors' levels of financial literacy on portfolio diversification. They suggest that investors' educational levels and their financial knowledge have a positive impact on investor diversification. Recently, Grohmann, (2018) investigated the relationship between financial literacy and financial behavior of people living in Bangkok and reported that higher financial literacy leads to improved financial decision-making. Raut, (2020), researching in the Indian context, explored the importance of past behavior and financial literacy in the investment decision-making of individual Indian investors. This study showed that past behavior had no significant direct impact on investors' intentions, and Indian investors were found to be highly influenced by social pressure which could be mitigated by financial literacy.

Other recent studies have also examined the impact of financial literacy from a number of angles. For instance, Mouna and Anis, (2017) examined the determinants of financial literacy and its impact on investment behavior in Tunisia and found that individuals with a low level of financial literacy are less likely to invest in the stock market. They observed that people with a low level of financial literacy could not examine financial ratios and do not have a basic understanding of which listed firms have good corporate performance. Financial literacy levels are affected by age, education level, and annual income. In similar vein, other research has shown that students from low-income families are less likely to enter high-standard quality schools which offer them the opportunity to learn various sources of knowledge including economics, finance and investment (Gennetian, Rodrigues, Hill & Morris, 2018). Rasool and Ullah, (2020) investigate the relationship between financial literacy and behavioral biases of individual investors in Pakistan and report a negative

association between financial literacy and behavioral biases of individual investors.

Informed by this literature, the current study hypothesizes that individuals' financial literacy is significantly related to investment decisions.

*H<sub>1</sub>. Financial literacy is significantly associated with investment decisions.*

Existing literature also suggests that there are socio-demographic factors that may affect the level of financial literacy of an individual. In a pertinent study, Volpe et al. (2002) conducted research with 530 individuals in one country online and observed their investment literacy. They found that the level of financial literacy is different for various groups with respect to age, gender, schooling level, and their historical electronic trading experience. More specifically, the study states that females had lower levels of financial education than males. Other findings included evidence that young people perform better than those who are older. Additionally, their study found that those who have a higher income are more literate than people with a lower income. The authors also noted that people who have a lower education level are less literate about investment options, electronic markets, and their products. Moreover, investors with lower incomes were less familiar with participating in investments than those with higher incomes. Investors who have less education perform worse than those with college or higher degrees. However, although it is apparent that many studies state socio-demographic factors including age, education, and family income impact financial literacy of adults, it is recognized that some researchers do hold a counter view and argue that family and background have little impact on financial literacy (Brau, Holmes & Israelsen, 2019). However, based on the overall findings of prior studies, the current study develops the following hypothesis:

*H<sub>2</sub>. Socio-demographic factors are associated with financial literacy.*

### III. Methodology

#### *Research Design*

The data for this research was collected from questionnaires which were sent to respondents. All variables in the data are represented by a binary specification of one and zero, according to Anis and Mouna (2016) and Yasmin et al. (2014), binary coding is appropriate for adapting logistic regression estimation. The questionnaire comprised thirty-two questions in total; fourteen questions concern the demographic traits and socioeconomic traits of respondents, and five questions deal with knowledge of investment.

The remaining thirteen questions deal with financial literacy and assist in its measurement. The second part of the questionnaire measures demographic variables (e.g. level of income, education level, gender, marital status). There are also questions about internet connection, bank accounts and ATM usage in this section.

#### *Sample of the Study*

The target population for the study was students who were enrolled in business-related studies in universities which are located in Lahore, Islamabad, Rawalpindi, Sargodha and Gujrat of Pakistan. Out of these it was found that around 600 students were enrolled in the selected cities. The study employs a random sampling technique. Accordingly, a questionnaire was distributed among graduate level students of different degree program like BBA (Bachelor of Business Administration), BSAF (Bachelors of School in Accounting and Finance), BCOM (Bachelor's in Commerce) and M.COM (Master's in Commerce), This study received responses from students across the selected cities and programs. The samples comprise adults aged 18 or above which is the requirement for trading in the Pakistan stock market.

#### *Questionnaire design and variables*

This research modified the questionnaire utilized in the studies of Mouna and Anis,

(2017) and Al-Tamimi and Bin Kalli, (2009) to investigate the effect of existing financial literacy on individuals' investment decisions. The questionnaire has 32 questions in total; 14 questions relate to socio-demographic and socioeconomic traits of respondents, and 5 questions deal with knowledge of investment. The remaining 13 questions deal with financial literacy and are designed to assist in the measurement of financial literacy. Each question contains one score. The questions are divided into three parts, the first section computes the financial literacy of respondents, while the second part measures the socio-demographic variables. These factors include level of income, education level, gender, marital status (MAR). Additionally, internet connection, and bank account (BA) information are included.

#### *Research Modeling*

The current study established the following two proposed models, equation one and two: equation one for investigating the effect of financial literacy on investment decisions, and equation two for determining factors associated with financial literacy. For the second equation, the study tests the effect of gender, age, internet connection, residential location, education level, spending, ATM facilities, bank account, guardian's occupation, marital status, father's education, mother's education, family income, and employment status on financial literacy. In this regard, the current study applies descriptive statistics, frequency distribution, cross tabulation, one-way ANOVA, OLS regression and logistic regression. Descriptive statistics are used to evaluate the summary of data in the form of central tendency like mean, median and mode as well as dispersion like standard deviation, range, minimum and maximum. Further, Skewness and kurtosis values are used to ascertain the normality of data, and these are reported. The research uses a one-way ANOVA test to assess whether there is a statistically significance difference between the means of more than two groups which are unrelated to each other. This study applies OLS

regression for equation one. Logistic regression analysis is adopted for equation two. Variables are coded with 0 and 1 in equation 1, so logistic regression is adopted to evaluate the defined relationship. This is also consistent with Anis and Mouna (2017) and Yasmin et al. (2014).

In addition, OLS regression is used to evaluate the defined relationship. For model 2, the independent variables are gender (GEN), age (A), internet connection (IC), residential location (RL), education level (EDU), spending (SPD), ATM usage (ATM),

bank account (BA), guardian's occupation (GO), marital status (MAR), father's education (F-EDU), mother's education (M-EDU), father's income (FI) and employment status (ES). The dependent variable for model two is financial literacy (FL) while the independent variables in this case include socio-demographic variables. Table 1 shows variables used in this study. Table 2 shows the details of the questionnaire responses according to labels and scales. The same patterns can be seen using descriptive statistics.

**Table 1.** Variables

Variables	Definition
<b><i>Dependent variables</i></b>	
Investment Decision (ID)	Explains activities which participants involve. Contains four activities: (a) hold any type of stocks, bonds, saving certificate or any other type of investment (b) invest in stocks, bonds, or any other type of investment on the recommendation of Broker (c) make investment on the recommendation of friends (d) consider the statements of Government Officials while investing Participants were asked if they attend these activities. Dummy variable, 1 if participants involve at least one out of four activities; 0, otherwise
Financial Literacy (FL)	Financial literacy scores based on questionnaires. Each question contains one score. Dichotomous variable in which FL is equal to 1, the participant has score higher than 60 %; 0, otherwise
<b><i>Explanatory variables</i></b>	
Gender (GEN)	Dichotomous variable in which GEN is equal to 1, the participant is male; 0, otherwise
Age (A)	Age of participants 1= 18-25 years old 2= 26-30 years old 3= 31-40 years old 4 = 41 above
Internet Connection (IC)	Dichotomous variable in which IC is equal to 1, the participant has internet connection; 0, otherwise
Residence Location (RL)	Dichotomous variable in which RL is equal to 1, the participant lives in town/city; 0, otherwise
Education Level (EDU)	Education level of participant 1=Metric to inter 2= Graduate 3= Master and MPhil
Spending (SPD)	Log number of participant spending per month
ATM Usage (ATM)	Dichotomous variable in which ATM is equal to 1, the participant uses ATM facility; 0, otherwise
Bank Account Availability (BA)	Dichotomous variable in which BA is equal to 1, the participant has bank account; 0, otherwise
Guardian Occupation (GO)	Occupation of guardian's participant

	0 = Unemployed 1 = Businessman 2 = Government Employee 3 = Private Employee
Marital Status (MAR)	Dichotomous variable in which MAR is equal to 1, the participant is single; 0, otherwise
Father's Education Level (F-EDU)	Education level of participant's father 1 = Under Matric 2 = Matric to inter 3 = Graduate 4 = Masters and MPhil
Mother's Education Level (M-EDU)	Education level of participant's mother 1 = Under Matric 2 = Matric to inter 3 = Graduate 4 = Masters and MPhil
Father's Income (FI)	Log number of father's income
Employment Status (ES)	Dichotomous variable in which ES is equal to 1, the participant is employed; 0, otherwise

**Table 2.** Frequency distribution

Variables	Value	Label	Frequency	Percentage
Investment Decision	0	No	131	26
	1	Yes	373	74
	Total		504	100
Financial Literacy	0	No	103	20.4
	1	Yes	401	79.6
	Total		504	100
Gender of Respondent	0	Female	128	25.4
	1	Male	376	74.6
	Total		504	100
Age of Respondent	1	Age 18 to 25	176	34.9
	2	Age 26 to 30	70	13.9
	3	Age 31 to 40	108	21.4
	4	Age 41 to above	150	29.8
	Total		504	100
Internet Connection	0	No	103	20.4
	1	Yes	401	79.6
	Total		504	100
Residential Location	0	Village	201	39.9
	1	City	303	60.1
	Total		504	100
Education Level	1	Matric to inter	44	8.7
	2	Graduate	89	17.7
	3	Masters and MPhil	371	73.6
	Total		504	100
ATM Usage	0	No	143	28.4
	1	Yes	361	71.6
	Total		504	100
Bank Account	0	No	32	6.3
	1	Yes	472	93.7
	Total		504	100
Guardian Occupation	0	Unemployed	46	9.1
	1	Businessman	262	52
	2	Govt Employed	183	36.3
	3	Private Employed	13	2.6
	Total		504	100
Marital Status	0	Unmarried	118	23.4

	1	Married	386	76.6
	Total		504	100
Parents' Education	1	Under Matric	153	30.4
	2	Matric to inter	193	38.3
	3	Graduate	102	20.2
	4	Masters and MPhil	56	11.1
	Total		504	100
Mother Education	1	Under Matric	220	43.7
	2	Matric to inter	214	42.5
	3	Graduate	43	8.5
	4	Masters and MPhil	27	5.4
	Total		504	100
Employment Status	0	Unemployed	225	44.6
	1	Employed	279	55.4
	Total		504	100

Hypothesis1 tests the relationship between financial literacy and investment decisions, and it is observed with the help of equation 1 (Eq1). Hypothesis 2 is examined in equation 2 (Eq2).

$$ID = \beta_0 + \beta_1(FL) + \varepsilon \tag{1}$$

$$FL = \beta_0 + \beta_1(GEN) + \beta_2(A) + \beta_3(IC) + \beta_4(RLt) + \beta_5(EDU) + \beta_6(SPDg) + \beta_7(ATM) + \beta_8(BA) + \beta_9(GO) + \beta_{10}(MAR) + \beta_{11}(F - EDU) + \beta_{12}(M - EDU) + \beta_{13}(F - Inc) + \beta_{14}(ES) + \varepsilon \tag{2}$$

**Descriptive statistics**

The descriptive statistics are shown in Table 3. The mean value of ID is close to 1 (0.74)

indicating that most of the respondents on average are making an investment decision. The standard deviation value of ID is about 0.44 which indicates that the actual value of an investment decision may deviate from its mean by up to 44%. The median and mode both show the same figure of 1 which indicates that most of the people are making investment decisions in accordance with the mean value. The skewness and kurtosis values of the investment decisions are in an acceptable range which is (±2) for skewness and (±7) for kurtosis which infers that the data for this variable are normally distributed.

**Table 3.** Descriptive Statistics

	Statistic (N = 504)				Std. Dev	Median	Mode	Skewness		Kurtosis	
	Range	Min	Max	Mean				Statistic	S. E	Statistic	S. E
ID	1.00	0.00	1.00	0.74	0.44	1.00	1.00	-1.10	0.11	-0.80	0.22
FL	1.00	0.00	1.00	0.80	0.40	1.00	1.00	-1.47	0.11	0.16	0.22
GEN	1.00	0.00	1.00	0.75	0.44	1.00	1.00	-1.13	0.11	-0.72	0.22
A	3.00	1.00	4.00	2.46	1.24	1.00	1.00	0.01	0.11	-1.62	0.22
IC	1.00	0.00	1.00	0.80	0.40	1.00	1.00	-1.47	0.11	0.16	0.22
RL	1.00	0.00	1.00	0.60	0.49	1.00	1.00	-0.42	0.11	-1.84	0.22
EL	2.00	2.00	4.00	3.65	0.64	4.00	4.00	-1.60	0.11	1.27	0.22
SPD	110000	10000	120000	42927	22551	40000	50000	0.95	0.11	1.95	0.22
ATM	1.00	0.00	1.00	0.72	0.45	1.00	1.00	-0.96	0.11	-1.08	0.22
BA	1.00	0.00	1.00	0.94	0.24	1.00	1.00	-3.59	0.11	10.94	0.22
GO	3.00	0.00	3.00	1.32	0.67	1.00	1.00	0.02	0.11	-0.23	0.22
MAR	1.00	0.00	1.00	0.77	0.42	1.00	1.00	-1.26	0.11	-0.42	0.22
F-EDU	3.00	1.00	4.00	2.12	0.97	2.00	2.00	0.49	0.11	-0.73	0.22
M-EDU	3.00	1.00	4.00	1.76	0.82	2.00	1.00	1.06	0.11	0.75	0.22

FI	455000	25000	48000	16226	128631	12000	30000	1.18	0.11	0.31	0.22
ES	1.00	0.00	1.00	0.55	0.50	1.00	1.00	-0.22	0.11	-1.96	0.22

Note: Variables are defined as the following: INV-D = Investment Decision, FL = Financial Literacy, GEN = Gender, A = Age, IC = Internet Connection, RL = Residence Location, EL = Education Level, SPD = Spending, ATM = ATM Usage, BA = Bank Account Availability, GO = Guardian's Occupation, MAR = Marital Status, F-EDU = Father's Education Level, M-EDU = Mother's Education Level, FI = Father's Income, ES = Employment Status.

Table 4 shows that out of 504 respondents, 103 were not financially literate, while the remaining 401 respondents were financially literate. Out of 103 respondents who were not financially literate, only 29 respondents have made investment decisions while 74

respondents did not make any investment in bonds, stocks, or any type of financial instruments. Out of 401 financially literate respondents, 344 respondents made investment decisions while the remaining 57 people did not make investment decisions.

**Table 4.** Cross Tabulation between Financial Literacy and Investment Decision

			Investment Decision		Total
			0	1	
Financial Literacy	0	Count	74	29	103
		% Within Financial Literacy	71.80%	28.20%	100.00%
	1	Count	57	344	401
		% Within Financial Literacy	14.20%	85.80%	100.00%
Total		Count	131	373	504
		% Within Financial Literacy	26.00%	74.00%	100.00%

Note: This table presents results from Cross Tabulation Analysis

Table 5 indicates that out of 504 respondents, 128 were females while 376 were male respondents. Of female respondents, 70 females were financially literate while 58

were not financially literate. Of the male respondents, 331 were financially literate while the remaining 45 were not financially literate.

**Table 5.** Cross Tabulation between Gender and Financial Literacy

			Financial Literacy		Total
			0	1	
Gender	Female	Count	58	70	128
		% Within Gender	45.30%	54.70%	100.00%
	Male	Count	45	331	376
		% Within Gender	12.00%	88.00%	100.00%
Total		Count	103	401	504
		% Within Gender	20.40%	79.60%	100.00%

Note: This table presents results from Cross Tabulation Analysis

Biographical variables like gender, age, education level, marital status, employment status and spending of respondents were used

for one-way ANOVA testing. Table 6 shows there is a statistically significant difference

between groups for all the socio-demographic factors included in the study.

**Table 6.** One-Way ANOVA for Biographical Factors

		Sum of Squares	df	Mean Square	F
GEN	Between Groups	12.372	1	12.372	74.718
	Within Groups	83.12	502	0.166	
	Total	95.492	503		
A	Between Groups	38.833	1	38.833	26.402
	Within Groups	738.373	502	1.471	
	Total	777.206	503		
EL	Between Groups	31.524	1	31.524	92.375
	Within Groups	171.315	502	0.341	
	Total	202.839	503		
MAR	Between Groups	21.407	1	21.407	155.824
	Within Groups	68.966	502	0.137	
	Total	90.373	503		
ES	Between Groups	7.039	1	7.039	30.07
	Within Groups	117.514	502	0.234	
	Total	124.554	503		
SPD	Between Groups	20351498509	1	20351498509	43.39
	Within Groups	2.35457E+11	502	469037420.8	
	Total	2.55808E+11	503		

Note: Variables are defined as the following: GEN = Gender, A = Age, EL = Education Level, MAR = Marital Status, ES = Employment Status, SPD = Spending.

#### IV. Empirical Findings

The empirical results are presented in Table 7. The first model uses financial literacy as the independent variable while investment decision is the dependent variable. The finding rejects the null hypothesis and accepts the alternative hypothesis showing the same statistically significant effect of financial literacy on the investment decision. The coefficient value of financial literacy is 0.530 with p-value of 0.000 ( $p < 1\%$ ) using OLS while the same has a coefficient value of 2.734 with p-value as 0.000 ( $p < 1\%$ ) using logistic regression. If one-unit increased in

financial literacy, the investment decision will be increased by 0.530 using OLS and be increased by 2.734 using the logistic regression technique.

It is shown that second model is statistically fit using both techniques while the R-square for OLS in the second model is about 0.28. The Cox & Snell R-square indicates a 22% variation in investment decisions due to the variation in financial literacy, while Nagelkerke R-square indicates approximately 33% variation in investment decisions due to the variations in financial literacy.

**Table 7.** OLS and Logistic Regression Results

Variables	Model (1) (DV = Investment Decision)					Model (2) (DV = Financial Literacy)				
	OLS Regression			Logistic Regression		OLS Regression			Logistic Regression	
	Coeff	Sig	VIF	Coeff	Sig	Coeff	Sig	VIF	Coeff	sig
FL	0.53	0	1	2.734	0	-	-	-	-	-
GEN	-	-	-	-	-	0.056	0.296	2.982	-0.319	0.72
A	-	-	-	-	-	0.059	0.216	2.332	-2.833	0
IC	-	-	-	-	-	0.352	0.000	1.763	8.418	0
RL	-	-	-	-	-	-0.175	0.000	1.689	-0.367	0.6
EL	-	-	-	-	-	-0.144	0.018	3.812	-0.596	0.42
SPD	-	-	-	-	-	0.094	0.035	2.033	0	0.35
ATM	-	-	-	-	-	0.169	0.000	2.059	7.683	0
BA	-	-	-	-	-	0.297	0.000	1.841	22.914	1
GO	-	-	-	-	-	-0.171	0.000	1.893	-5.614	0
MAR	-	-	-	-	-	0.311	0.000	2.93	9.313	0
F-EDU	-	-	-	-	-	0.088	0.043	1.951	0.982	0.06
M-EDU	-	-	-	-	-	0.215	0.000	1.908	-0.294	0.47
FI	-	-	-	-	-	-0.172	0.000	1.79	0	0
ES	-	-	-	-	-	0.024	0.614	2.236	1.034	0.13
Constant	0.282		-	-0.937	0	-0.069	0.482	-	-19.766	1
R-Square	R-Square	0.281	Cox & Snell R Square = .223			0.526	Cox & Snell R Square = .441			
Std. Error of Estimate	Std. Error of Estimate	0.373	Nagelkerke R Square = .327			0.282	Nagelkerke R Square = .693			
Durbin-Watson	Durbin-Watson	1.742	-2 Log likelihood = 450.337			2.245	-2 Log likelihood = 217.324			
F (14,489)	F (1,502)	195.9	Chi-square (1) = 127.221			38.72	Chi-square (14) = 293.121			
Significance of Model		0				0	0			

Note: Variables are defined as the following: INV-D = Investment Decision, FL = Financial Literacy, GEN = Gender, A = Age, IC = Internet Connection, RL = Residence Location, EL = Education Level, SPD = Spending, ATM = ATM Usage, BA = Bank Account Availability, GO = Guardian Occupation, MAR = Marital Status, F-EDU = Parents' Education Level, M-EDU = Mother Education Level, FI = Father's Income, ES = Employment Status.

Regarding socio-demographic factors, the results show a positive and statistically significant relationship between parents' education and financial literacy when adopting OLS as well as logistic regression. The finding fails to reject the null hypothesis and accepts the alternative hypothesis showing the same statistically significant relationship between both variables. The coefficient's value of father's education

using OLS technique is 0.088 with p-value as 0.043 ( $p < 5\%$ ) while the same factor has the coefficient's value as 0.982 using logistic regression technique with p-value as 0.055 ( $p < 10\%$ ). If one-unit is increased in father's education using OLS, financial literacy will increase by 0.088 while it will increase by 0.982 using logistic regression. Regarding the father's income, the coefficient value for father's income using OLS technique is .172

with p-value as .000 ( $p < 1\%$ ) and the same has coefficient's value as .000 with p-value as .000 ( $p < 1\%$ ) using logistic regression technique. If one-unit is increased in family income, the financial literacy will increase by 172 using OLS technique and the same will increase by .000 using logistic regression technique.

The factor of a guardian's occupation shows a negative, but highly significant relationship with financial literacy when using both OLS as well as logistic regression techniques. The finding of this factor rejects the null hypothesis and accepts the alternative hypothesis indicating the same statistically significant relationship between guardian occupation and financial literacy. The value of the coefficient using OLS is -0.171 with p-value as 0.000 ( $p < 1\%$ ) while using a logistic regression analysis technique, the value of the coefficient is -5.614 with the p-value as 0.000 ( $p < 1\%$ ). If one-unit is increased in relation to a guardian's occupation, financial literacy will decrease by 0.171 using OLS, and will decrease by 5.614 using logistic regression. The finding in relation to this factor is not consistent with any of the findings of previous researchers such as Mouna & Anis (2017).

There is positive and highly significant relationship between marital status and financial literacy using both OLS as well as logistic regression technique. The finding of this factor failed to reject the null hypothesis and accepts the alternative hypothesis showing the same statistical significant relationship between both variables. The coefficient value for marital status using OLS is .311 with p-value as .000 ( $p < 1\%$ ) while using logistic regression the value of coefficient is 9.313 with p-value as .000 ( $p < 1\%$ ). If one-unit is increased in marital status, the financial literacy will increase by .311 using OLS and the same will increase by 9.313 using logistic regression.

In terms of employment status, the findings demonstrate a positive and statistically insignificant relationship between employment status and financial literacy. The

finding failed to reject the null hypothesis showing the same statistical insignificant relationship between both variables. The value of the coefficient for employment status using the OLS technique is 0.024 with a p-value as 0.614 and a coefficient value of 1.034 with p-value as 0.126 using logistic regression technique. Increasing one-unit in employment status may increase 0.024 in financial literacy using the OLS technique, while doing the same may increase 1.034 in financial literacy by using logistic regression technique.

## V. Conclusion

This study explores the factors which affect financial literacy and investigate the impact of financial literacy on investment decisions within the context of Pakistan. The present study includes gender, age, guardian's occupation, education level, marital status, father's education, mother's education, father's income, and employment status as socio-demographic factors. Additionally, some variables such as internet connection, residential location, spending, ATM usage, bank accounts are also examined to see if these factors associate with financial literacy. The study applied logistic regression to evaluate the relationship between these selected factors and investment decisions., In identifying key factors (father's income, father's education and marry status) that affect financial literacy, the findings of this study are also consistent with the research of Mouna and Anis (2017), and Al-Tamimi and Bin Kalli (2009). However, the guardian occupation decreases financial literacy level. In addition, this study investigates the relationship between financial literacy and investment decisions. The study applied OLS to investigate the defined relationship. It was found that there is a significant association between financial literacy and investment decision. This result is consistent with the study of Gao (2015); Sui and Niu (2018) and Mumtaz and Smith (2021). Research indicates that this might be because an increase in the level of financial literacy

reduces the likelihood of investors' behavioral bias (Rasool & Ullah, 2020). The results of the current research are also confirmed by a prior study that shows that these socio-demographic variables are found to have influential impact on an individual's account ownership behavior in Pakistan (Batoool & Arshad, 2020).

From the financial perspective, the study adopts the signaling theory to explain the relationship between socio-demographic factors and financial literacy. It can be discussed that the leader of the family with high education background and income act as a positive strong signal informing the adults in the family also have higher financial literacy (Philippas & Avdoulas, 2020). The individuals with married status present positive sign that they can manage their family budget and plan for better financial wealth. Individuals have higher level of education have a higher probability of having the final say on household decisions (Cheng, 2019). In the opposite, individuals grown up with parents who are unemployed tend to have low financial literacy. Parents have secure jobs demonstrates positive signal that they have ability to support their children for various type of education and for having bridge future (Devercelli & Beaton-Day, 2020; Bartoszek, Deal & Yerhot, 2021). Additionally, children with well-schooled parents and educated couples could learn about knowledge and experience from each other (Mahdavi & Horton, 2014).

This study contributes previous literature in terms of adopting signaling theory which is usually mentioned in the capital market to interpret the association between various factors relating to financial literacy (Connelly, Certo, Ireland & Reutzel, 2011). This can suggest individuals as well as various entities, for example banks, financial institutions, and investment companies, to notice positive signals about education and income of the family leader before issuing loan, advising investment options and propose financial instruments. Positive signals confirming that individuals

understand financial concept about interest, return and risk, then they tend to face less problems relating to debt repayment, and loss on investment. It is recommended that policy makers in Pakistan should try to improve financial literacy levels in order to enhance investment decisions in Pakistan. For the purpose of increasing financial literacy, policy makers should focus on factors relating to internet connection, family income, marital status, and ATM usage, while a guardian's occupation and age will decrease the financial literacy level. Additionally, knowledge about inflation, compounding interest and diversification of risk should be promoted and disseminated to help individuals to make appropriate investment decisions (Awais, Laber, Rasheed & Khursheed, 2016). The current study covers the data collected from students, bankers, job holders and businessmen from 504 respondents within the area of the Punjab. Future research may include the all the provinces and more respondents from Pakistan.

Note: We would like to declare that there is no conflict of interest in the research.

The data cannot be made available.

We would like to confirm that all research was performed in accordance with relevant guidelines/regulations. We confirm that informed consent was obtained from all participants and/or their legal guardians.

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