

Measuring the Financial Literacy of Real Investors of the Iran Stock Exchange and the Relationship of Financial Literacy with the Portfolio Diversification and their Investment Decisions

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Abstract: Diversified business activities require timely and intelligent decisions with specific information. Today, a wide range of factors is considered in making investment decisions. In other words, it seems essential to examine different factors for investing. Investors' decisions are getting more and more complex and risk and the results of these investments might have significant effects on the people's life especially in retired times. Those who enter business for the purpose of investment have different financial knowledge. This difference in financial literacy may influence their decisions. In the present study, the financial literacy concept is initially defined and the theoretical backgrounds are provided and literature reviews of this topic are also documented. The financial literacy is then assessed by a modified questionnaire and the relationship of financial literacy and investors' decisions is also examined by 29 effective factors of their decisions. The findings confirm the lack of financial literacy in the sample. Additionally, the results show that there is no significant relationship between financial literacy and investor's decisions measures.

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1. Introduction

Financial Association of Researches in Educations of England defines financial literacy as the ability to inform judgments and effective decisions in using monetary resources and its management (Noctor& et al, 1992). Financial literacy is the topic occupied the attention of many researchers, so that America and England are the first countries taken financial literacy followed by Australia, Netherlands, Italy and Malaysia. The numerous numbers of studies and the implementation of different training plans assert this considerable significance especially in America. Nearly most of the states of America have the enacted curriculum of the financial literacy. Jump Start is a coalition which holds the responsibility of development and improvement of the financial literacy and establishes a periodic test of financial literacy every two years and publishes the results. In England, the personal finance has been regarded as a part of the national education and applied in the standards of the national training program (Pang, 2010).

Today, understanding the related concepts and skills of financial literacy is an essential process. This is because the fact that it makes the consumer capable to retain in the modern society and resist the diversity and complexity of the productions and services. It can be argued that.

having financial skills became much more important in the recent decades, since the enterprises are

working in a competitive environment with facilitated finance patterns. Availability of different loans and other payment methods caused the incremental growth of the individual's and families' debt level.

Consequently, having enough financial literacy is an essential base for solving the financial problems. This is also necessary for having a successful, healthy and happy life (Bird, 2008). Financial literacy and the requirements of its investigation are so important because the lack of qualified financial literacy impacts on the lives of individuals, families, friends and business parties. This inefficiency lies in the improper decisions made by them and the inappropriate effects on the society and even the reduction in national wealth and financial well-being (Slaughter, 2009).

The findings of different studies reveal that financial problems and economic pressures partially resulting from the lack of financial literacy might be related to the following items: 1. Family enmities, 2. Harsh and rough behaviors of the parents, 3. Inability of the youths to confront with the daily problems and issues, 4. Increasing the abnormal attitudes in the society, 5. Addiction to alcohol drinks and 6. The delinquencies (Elder& et al, 1992). Financial literacy as improved the earnings of the various groups including governments, banks, employers, investment groups, financial markets and other organizations especially in developed countries. The significance of

the financial literacy results from some factors including developing new products, complexity of the financial markets and changes in the political, demographic and economic characteristics (Al-Tamimi and Bin Kalli, 2009).

Information about the portfolio diversification is a key factor considered in different literatures. Investors might not be aware of all the characteristics of the available assets and invest only in the few familiar numbers of them. There is little information about the effect of financial literacy on the investors' portfolio diversification, regardless of the incremental interest and concerns of the finance educations of the individuals, (Abreu and Mendes, 2010).

Financial literacy and perceiving its concepts for the investors is very significant because the individuals of each society need to make investments to safeguard themselves against the inflation or keep their economic situation at least in zero condition. It means that with the passage of time, they could maintain their purchasing power and achieve a higher financial well-being in their life. According to the necessity of understanding the financial literacy concept for the different spectrums of the society including investors, the main objective of this study is measuring the financial literacy of the real investors on the Stock Exchange and understanding the factors affecting on the investors' decisions and its relationship with the portfolio diversification and their decisions.

2. Theoretical Background and Hypotheses Development

The prior literatures have provided different definitions for the financial literacy and personal finance which are summarized below:

Financial literacy is the ability to make informed judgments and to take effective decisions about utilizing and managing the monetary resources (Noctor et al, 1992).

Financial literacy is the ability of individuals in getting information, analyzing and managing the financial position of them so that it influences on their financial well-being. This is an indicator of the ability to gather information in the form which is distinguishable from different other financial choices. Additionally, the debates of financial and monetary topics and planning and accountability to the factors influencing on the daily performance are also involved in this definition (vitte& et al, 2000). Financial literacy is the basic knowledge of the people in order to retain in the modern societies (Kim, 2001).

Financial literacy is the perception of the financial terms and concepts required for the daily performance in American society (Bowen, 2002).

Financial literacy is a broad concept defined as the ability to make reasonable, informed and logical decisions in relation to the money management. Its components include the general perceptions of budgeting, the theoretical knowledge about financial services provided by financial institutions and other responsible investments in order to achieve the predefined goals (Worthington, 2006).

Financial literacy is the ability to utilize financial knowledge and skills required for the effective management of the financial resources in earning the permanent well-being (Jump Start Coalition, 2007). Financial literacy is the ability of an individual in perceiving and utilizing the financial issues (Servon and Kaestner, 2008).

Financial literacy, financial knowledge and financial education are the main inputs of the models to measure the financial literacy which are alternatively used instead of each other. There are a few researchers which accurately defined and separated these terms, but there is no consensus standard for measuring the financial literacy (Hanna & et al, 2010).

Financial literacy has been studied from different aspects. Governments and private organizations in developed countries have conducted studies to measure the financial literacy throughout the world. Some of these studies examined the effect of educational programs on financial literacy. For example, the effect of a modern educational pattern on developing the financial literacy among the Hong-Kong students has been analyzed. The findings of the study demonstrate that this pattern impacts on the financial literacy and its permanency (Pang, 2010).

In another study, the effect of a documented financial education plan in different states of the America on the financial literacy score of the high school has been examined. There was no significant difference observed between the score of financial literacy of those students in the states with the documented topics with the other states. The authors attribute this result to the application method and effectiveness of the educational programs in different states (Tennyson and Nguyen, 2001). Another group has evaluated the impact of personal finance educations provided in the high school and university on the investment knowledge and savings of the American students. The students, in average, got the grade of 5.6 out of 10.

Their findings indicate that the scores of those participating in personal finance courses were more than the others. Revenue, career and education level were also significantly related to the financial

literacy; while the males were more financial literate than the females (Pang et al, 2007). In another study, the researchers believed that On-line investors should have more knowledge than the normal ones in the achievements of the securities market. Hence, the researchers of financial literacy examined 530 on-line investors and their differences in the level of literacy in terms of age, gender, income, education and job experience. Their findings reveal that the level of financial literacy varies with the education, experience, age and gender. Especially, females were less literate than males and the older participants outperformed than younger ones. Additionally, on-line traders were more knowledgeable than others.

Those investors with higher revenues also were in a better position than the adverse ones and this holds for the investors with higher education (Chen and Volpe, 2002). The researchers in a paper titled "Financial Literacy and Portfolio Diversification" investigated the relationship of financial literacy, portfolio diversification and demographic variables in the capital markets of Portugal. Demographic variables involved the academic educations' level of the investors, gender, age, marital status, family size, income level, residential area, housing status, social situations and careers. Portfolio diversification measures also include the number of the properties in the investment portfolio of banking deposits, bonds and different types of the stocks. The significant findings reveal that financial literacy, education level and information quality impact the number of portfolio properties (Abreu and Mendes, 2010).

Another group of the researchers evaluated the level of financial literacy of individual investors of UAE capital market. They also examined the effect of financial literacy on the investment decisions and other factors involved in the investment. The results showed that the level of financial literacy of the investors is much lower than the common level and is in a long distance from the required level. Financial literacy had been affected by the level of income, education and job schemes; while age had no effect on the financial literacy. Males were more literate than the females, they found. The significant relationship between financial literacy and investment decisions of the respondents was also confirmed (Al-Tamimi and Kalli, 2009).

Regardless of the specific attention paid to the financial literacy, this is the topic rarely discussed in Iran. The present paper measures the financial literacy of the real investors in the Iran Stock Exchange and also examines the relationship of financial literacy and portfolio diversification with the decision-making measures. This association has been analyzed through the following hypotheses:

H1: Real investors of the Iran Stock Exchange are financially literate.

H2: Demographic characteristics of the investors are related to their financial literacy.

H3: The financial literacy of the investors is related to the portfolio diversification.

H4: The financial literacy of the investors relates to the investment decisions of them.

3. Methodology

The present study is an applied descriptive research. The published books about the literature and theoretical concepts of the personal finance were used to gather information. Therefore, the field studies were executed in the two steps described below:

The standard questionnaire introduced by Al-Tamimi and Ben Kalli was utilized as the certified questionnaire. This is nationalized according to the business environment of Iran and there were some questions added because of the special economic situations of Iran (inflation). Finally, a questionnaire was designed composed of 58 questions in three sections. The first section includes 12 questions. Seven of them are related to the demographic information and five others are associated with the portfolio diversification of the investors. The second section examines 29 factors influencing on the investment decisions of the investors using five-point Likert scale. These factors are classified in five categories. Seven factors are related to the matching of the firm's image and the investor's mind, nine factors are about the financial and accounting factors, three of them were general information, the five elements were classified as biased proposes and the rest was associated with the personal financial needs of the investors. The third section of the questionnaire measures the level of the financial literacy by using 17 true-false questions.

As the second phase, 200 questionnaires were distributed among the investors and 160 questionnaires were also collected.

The main hypothesis of the research is about the financial literacy adequacy of the real investors of the Iran Stock Exchange and is analyzed by using the main comparison of the single sample. The average score of the financial literacy of the students has been evaluated based on 100 and compared with 50. The second main hypothesis tries to analyze the effect of demographic characteristics of the investors on the financial literacy. This assumption is analyzed by using two independent variables (for the comparison of two independent populations), ANOVA test (for the comparison of more than two populations) and LSD test. The third main hypothesis is about analyzing the relationship of financial literacy and

portfolio diversification by using Kendal correlation coefficient. The main fourth hypothesis considers the financial literacy and decision-making measures and is analyzed by the simple linear regression.

Cronbach's alpha is the instrument to measure the reliability of the study. We used SPSS software to calculate the reliability of 29 questions and this measure is 0.878 which is an indicator of the sufficient reliability.

4. Data Analysis

Initially, the descriptive statistics of the demographic characteristics and portfolio diversification are examined and the hypotheses are further described.

4.1. Descriptive Findings

Table 1 indicates the summary of the descriptive statistics about the demographic characteristics of the participants.

Table 1. The summary statistics of the demographic characteristics

Demographic Characteristics	Status	Number	Percentage
Age	Younger than 30 years	42	26.3
	31-40	46	28.8
	41-50	41	25.6
	Older than 50	31	19.4
Gender	Male	150	93.8
	Female	10	6.3
Demographic Characteristics	Status	Number	Percentage
Employment status	Full time	41	25.6
	Part time	12	7.5
	Own business (Individual)	50	31.3
	Own business (contractor)	8	0.5
	Student/unemployed/retired	49	30.6
Monthly Income (Rials)	5000000 or less	41	25.6
	more than 5000000-7500000	58	36.3
	More than 7500000-10000000	39	24.4
	More than 10000000-15000000	12	7.5
	More than 15000000-20000000	4	2.5
Workplace Activity	More than 20000000	6	3.8
	Financial/Banking	71	44.4
	Others	89	55.6
Education Level	Below diploma	10	6.3
	Diploma	44	27.5
	Technical diploma or bachelor	83	51.9
	M.A and higher	22	13.8
	Missing data	1	0.6
Academic Major	Management/Accounting/Economics	32	0.20
	Other majors	87	54.4
	Missing data	41	25.6

As the table above shows, 26.3% of the investors were less than 30 years, 28.8% of them were between 31-40 years, 25.6% were between 41-50 years and 19.4% of them were older than 50. With respect to gender, 93.8% of the investors were male and the remaining was female. About 33.1 percent were employees and 31.8 percent were self-employed, while the others were student/unemployed/retired respondents. The monthly income of the family was less than 10000000 for more than 85 percent of the participants. 44.4 percent of the participants were engaged in financial and banking jobs and the rest were involved in non-financial jobs. Additionally, 33.5% of the respondents were below diploma, 51.9 percent of them were of technical diploma and the rest were in higher educations. 32 people of those with academic educations were studying management/economic/accounting and 87 ones were studying other majors. Table2 presents the summary statistics of the portfolio diversification.

Table 2. The Summary Statistics of the Portfolio Diversification

Portfolio	Status	Number	Percentage
Investment Type	Short-term and Long-term Deposits	85	53.1
	Securities	20	12.5
	Land and Building	50	31.3
	Gold	32	0.20
	Currency	2	1.3
Stock Diversification	0-5 types of stocks	93	58.1
	6-10 types of stocks	45	28.1
	11-15 types of stocks	9	5.6
	More than 15 types of stocks	8	0.5
	Missing data	5	3.1
Portfolio Diversification *	1	41	25.6
	2	66	41.3
	3	42	26.3
	4	8	0.5
	5	3	1.9
* Portfolio diversification means long-term and short-term deposits, securities, land and building, gold and currency.			

As table above demonstrates, 53.1 percent of the participants had long-term and short-term deposits, 31.3 percent of them had investments in land and building followed by gold and securities with 0.20 and 12.5 percent. Only 1.3 percent of the investors invest in currencies. In terms of portfolio diversification, 58.1% of the investors invested in 0-5 types of stocks; while 28.1 percent of them invested in 6-10 types of stocks. 41.3 percent of the participants invested in two schemes, 26.3% in three fields, 25.6% in one field, 1.9% in five schemes and 0.5% invested in 4 cases.

4.2. Hypothesis Testing

The first hypothesis is tested by comparing the average score of financial literacy based on 100 with the sufficient score on 50. Mean comparison of the independent single sample is used in this stage. The findings of the hypotheses are presented in tables 3 and 4.

Table 3. The Descriptive Statistics of the Participants' Score

Financial Literacy Score	Number	Minimum	Maximum	Mean	Std. Deviation
Score from 100	160	0/00	59/00	14/6563	11/60516

Table 4. The Comparison of the Investors' Scores with 50

Hypothesis	Comparison with 50					
	t-statistics	Degree of Freedom	Significance Level	Mean Difference	Confidence Level of 95%	
					Minimum	Maximum
1	-38/523	159	0/00	-35/34375	-37/1557	-33/5318

The significance level shows that the average score on the financial score is less than 50. This is an indicator of the inefficient financial literacy among the investors. Table 5 indicates the percentage of the participants who correctly replied to the questions sorted according to the highest scores.

Table 5. The Percentage of the Correct Responses

No.	Category	Question Number	The Percentage of the Correct Responses
1	Investments Diversification	1	84/4
2	Investments in Hedge Funds and Market Volatilities	13	66/9
3	The Relationship of Interest Rate, Inflation Rate and Purchase Power	14	63/8
4	Compound Interest	6	51/9
5	Market Efficiency and Technical Analysis	2	49/4
6	The Relationship of Inflation Rate and Money Purchase Power	15	48/8
7	The Relationship of Securities and Ownership	4	46/9
8	Securities	7	44/4

9	Interest Rate and the Price of the Securities	5	38/8
10	Common Stocks, Securities, Banking Investments	9	34/4
11	P/E and EPS Relationship	10	31/9
12	Hedge Funds	8	28/8
13	The Relationship of Risk and the Volatility of a Share	17	28/8
14	Beta	11	25/6
15	Investments Return	16	25/6
16	Dividend	3	23/8
17	ROA and ROE	12	19/4

Table 5 shows that the most range of the correct responses belongs to the first question and it means that the investors have perfectly perceived this question. Four cases were scored higher than average. Investment diversification, investments in hedge funds, compound interest and purchasing power are concepts relatively perceived by the investors. The scores of thirteen cases were less than average. The lowest score belongs to ROA, ROE followed by dividend. It means that the investors are less knowledgeable about these questions.

The second hypothesis is about the relationship of demographic characteristics of the sample with the level of financial literacy. The summary statistics of the hypothesis are presented in table 6.

Table6. The Summary Analysis of the Second Hypothesis

Variable	Status	T or f-statistics	d.f	sig	Result	Interpretation
Age	Younger than 30	1/410	3	0/242	No significant relationship between age and financial literacy	-
	31-40					
	41-50					
	Older than 50					
Gender	Male	-	-	0/074	The significant relationship between gender and financial literacy	Male are more financially literate than female
	Female					
Employment status	Full time	3/496	4	0/09	Significant relationship between employment status and financial literacy	The least financial literacy belongs to full time employees and the most is for the students/unemployed/retired
	Part time					
	Self employed (Individual)					
	Self employed (contractor)					
	Student/unemployed/retired					
Monthly Income	5000000 or less	0/812	4	0/543	No significant relationship between monthly income and financial literacy	-
	more than 5000000-7500000					
	More than 7500000-10000000					
	More than 10000000-15000000					
	More than 15000000-20000000					
Activity Field	Financial/Banking	-	-	0/409	The significant relationship between activity field and financial literacy	-
Other						
Education Level	Below diploma	1/551	3	0/204	No significant relationship between educational level and financial literacy	-
	diploma					
	Technical diploma and bachelor					
	M.A and higher					
Academic Major	Management/Accounting/Economics	-	-	0/339	No significant relationship between academic major and financial literacy	-
	Other majors					

The third hypothesis is about the relationship of financial literacy and portfolio diversification of the investors. The Kendall correlation coefficient was used to test this hypothesis. The related findings are provided in table 7.

Table7. The Findings about the Third Hypothesis

The Third Hypothesis		Financial Literacy Score of 100	Portfolio Diversification
Financial Literacy Score of 100	Correlation coefficient	1.000	0.121
	Significance level	-	0.062
	number	160	160
Portfolio Diversification	Correlation coefficient	0.121	1.000
	Significance level	0.062	-
	number	160	160

The significance level shows that those individuals with higher financial literacy have more diversity in investment. Hence, portfolio diversification is positively related to the financial literacy. Factors influencing on the investors' decision-making: Table 8 ranks the five groups of measures relating to the decision-making measures according to their average and table 9 demonstrates the classification of elements in each group and their average

Table8. The Classification of the Groups

Category	Average
Financial and Accounting Information	3.4153
Self Image/Firm Image Coincidence	3.2643
General Information	3.2985
Personal Financial Needs of the Investor	3.0875
Advocate Recommendation	2.7512

Table 8 depicts the group with the most impact on the decision of the investors is financial and accounting information; while the least effect belongs to the Advocate recommendations

Table9. Factors Classifications

classifications	Factors	Average
Financial and Accounting Information	Past performance of the firm's stocks	3/8313
	marketability of the stocks	3/8250
	Expected earnings of the firm	3/7438
	Economical stock price	3/7438
	The position of the financial statements	3/6063
	Internal information	3/2125
	Personal skills	3/1563
	Technical analysis results	3/1000
Self-Image/Firm Image Coincidence	Rumors	2/5188
	Firm's reputation	3/9250
	Firm status in the industry	3/5125
	Feelings for a firm's products and services	3/3688
	Reputation of the institutional shareholders	3/2938
	Ethical values of the firm	3/1313
	Legal issues	2/9500
General information	Increase of the firm's involvement in solving community problems	2/6688
	Recent price movement in a firm's stocks	3/4875
	Current economical proxies	3/2000
Personal financial needs	Coverage in the press	3/2000
	Dividends paid	3/7688
	Risk minimization	3/2875
	Diversification purpose	3/0625
	Expected losses of investment in other parts	3/0188
Advocate Information	Ease of obtaining borrowed funds	2/3000
	Consultants and financial analyzers	3/3500
	Institutional shareholders' opinion	3/0563
	broker recommendation	2/6563
	Friends recommendations	2/6125
Family member opinions	2/0813	

The most effective factor in the decisions of the investors relates to the firm's reputation (3.9250) followed by the past performance of the firm's stock (3.8313). The least effective factors are the family member opinion (2.0813) and ease of obtaining borrowed funds (2.3000).

The fourth hypothesis is defined about the relationship of financial literacy and decision-making measures and analyzed by simple linear regression. The findings of this hypothesis are provided in table 10.

Table10. The findings of the fourth hypothesis

Group	R^2	adj. R^2	β	t	sig
Self image/ firm image coincidence	0.303	0.298	-0.031	-8.281	0.000
Financial and accounting information	0.153	0.147	-0.021	-5.338	0.000
General information	0.058	0.052	-0.016	-3.114	0.002
Personal financial needs	0.390	0.152	-0.023	-5.325	0.000
Advocate Information	0.152	0.383	-0.037	-9.980	0.000

As shown above, financial literacy impacts the measures of decision-making. Consequently, according to the negative coefficient of financial literacy in all the models, those with less financial literacy are less influenced by the defined measures.

5. Discussions

The results of the first hypothesis confirm the inefficiency of the financial literacy in the society. This is consistent with the findings of Al-Tamimi and Ben Kalli. Providing no training period and improper representation of financial literacy to those who enter the capital market are among the main existing weaknesses.

Investigating the association of demographic characteristics and financial literacy showed that male participants are more financially literate than females. This might be due to the less involvement of females in financial issues. This conclusion is also supported by Abreu and Mendes (2010), Al-Tamimi and Ben Kalli (2009) and Chen and Volpe (2002). Employment status is also associated with financial literacy. LSD and Duncan tests indicated that the least financial literacy is related to full time job; while the most financial literacy belongs to the students/unemployed/retired respondents. This is an interesting conclusion because it was expected that employees are more financially capable but this result can be attributed to the high scientific level of the students and working experience of the retired people. The relationship between employment status and financial literacy has been previously confirmed by Al-Tamimi and Ben Kalli (2009) and Abreu and Mendes (2010). Generally, it can be declared that nodemographic characteristic (except for gender and employment status) impacted the financial literacy level of the society.

Examining the relationship of financial literacy with the portfolio diversification indicated that those with higher financial literacy have more diversified investments. This is consistent with Aberu and Mendes (2010). Testing the fourth hypothesis shows

that financial literacy of the investors is not associated with the decision-making measures of the investors. Actually, financially literate investors are less dependent upon the factors and they might make decisions from different factors.

6. Applicable Suggestion

Research Based Suggestions: we propose some suggestions according to the research hypotheses. The financial literacy of the total society has not been asserted. On the other hand, financial skills of the individuals and the social life of the people have been confirmed in the previous studies. Stock exchanges are suggested to provide training periods in different levels of basic, intermediary and advanced levels to the investors in a proper format. This information is also among that information required to the investors. This might help the market transparency and motivate individuals to sell or buy the stocks regardless of the excitements surrounded. The findings demonstrate that females are not as strong as the males in terms of the different schemes of financial literacy. Women play essential roles in social themes and nurturing the children along with maintaining the family. They highly endeavor to increase their financial knowledge and the educational programmers also focus on the women.

Future Studies: Further studies can be dedicated to find which issues should be trained and where is a better place to hold the responsibility of this career. The future studies can measure the financial literacy of different spectrums of the society including legal investors, employees, staffs, contractors, students and so on. Additionally, the future studies might measure the financial literacy of the real investors in stock exchanges and examine its relationship with the mental factors influencing on the investment decisions. These factors involve biorhythmic elements, prestige of the investors, intrinsic analyses behavior and self-confidence.

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