# Developing Relationship between Investors Psychology and Financial Decision Making

**Tarika Singh[1] , Seema Mehta[2], Vikram Parmar [3]**

[1 First Author] Associate Professor, Prestige Institute of Management, Gwalior, India.

[2 Second Author] Associate Professor, IIHMR, Jaipur, India

[3 Third Author] Alumnus, Prestige Institute of Management, Gwalior, Indida.

## Abstract

The study aims to find out relationship between investor's psychology and financial decision making. A questionnaire containing ten questions for investor's psychology and eleven questions on financial decision making was administered. The questionnaires addressed demographic and cultural variables and resulted in three investor's psychology and three for financial decision making. The results show differences in psychology of investors of different age groups. Similarly difference in financial decision making was observed for different age groups. Also a linear dependency was observed between the psychology and decision making

## 1. Introduction

Psychology is variedly defined by different researchers time and again. Like William (1892) defined Psychology as the scientific study of the human mind and its functions, especially those affecting behavior in a given context Psychology has the immediate goal of understanding individuals and groups by both establishing general principles and researching specific cases. Different people have different - different psychology. It there is a different in psychology because of which people take different decision. Feldman (1990) defined Psychology as the scientific study of human behavior and mental processes. The second variable of the study has also attracted the attention of researchers time and again. Decision making is the mental process resulting in the selection of a course of action among several alternatives. Stoner (1996) defined that Decision making is the process of identifying and selecting a course of action to solve a specific problem. Trewartha and Newport (1997) said that decision making involves the selection of a course of action from among two or more possible alternatives in order to arrive at a solution for a given problem. Every decision making process produces a final choice in an action or an opinion of choice. Many aspects of investment analysis are psychological in nature and involve the thought process of selecting a logical choice from the available options. Investors' decision-making involves both the emotional and mental factors and they are difficult to be separated.
As per a definition given in business dictionary, decision making can be defined as, "it as the thought process of selecting a logical choice from the available options". Further Gigerenzer and Gaissmaier (2011) said Investors' decision-making is not rational so it is very difficult to separate the emotional and mental factors involved in the

process of decision-making in which the investors go through by collecting relevant evaluation of the information. But on the other hand Slovik (1972), said that the "Many aspects of investment analysis are psychological in nature" and provides a catalogue of decision biases. Abundant evidence shows that financial decision makers do not make clinical calculations using rational methodology, but instead systematically depart from utility maximization".

## 2. How Decisions are Taken

Decision making can be regarded as the cognitive process resulting in the selection of a course of action among several alternative scenarios. Every decision making process produces a final choice. The output can be an action or an opinion of choice.

Decision making stages: Verma (2005) quoted in her book the stages of decision making developed by Fisher, (2000). There are four stages that should be involved in all group decision making. These stages, or sometimes called phases, are important for the decision making process to begin.

Orientation stage– This phase is where members meet for the first time and start to get to know each other.

Conflict stage– Once group members become familiar with each other, disputes, little fights and arguments occur. Group members eventually work it out.

Emergence stage– The group begins to clear up vague opinions by talking about them.

Reinforcement stage– Members finally make a decision, while justifying themselves that it was the right decision.

 Each step in the decision making process may include social, cognitive and cultural obstacles to successfully negotiating dilemmas.
The following demographic definitions are provided in order to clarify why these characteristics continue to be considered by many investment managers and some researchers to be effective in differentiating among levels of investor risk to tolerance, and why they were used as components within the background analysis stage in the empirical model.

**Gender:** As quoted by Grabel and Lytton (1999) and defined by Roszkowski et al. (1993), gender is considered as important factor for risk tolerance as well as decision making among investors. Research done in different contexts have also proved the same (Slovic, 1966; Bajtelsmit & Bernasek, 1996; Bajtelsmit & Bemasek, 1996,b; Blume, 1978; Coet & McDermott, 1979; Hawley & Fujii, 1993-1994; Higbee & Lafferty, 1972; Hinz, McCarthy, & Turner, 1997; Rubin & Paul, 1979; Sung& Hanna, 1996b; Xiao & Noring, 1994).
Grable, J. E.(1997); Davar and Gill (2007)suggested that males have higher level of awareness and satisfaction than females for various investment venues. Lutfi (2010) revealed a significant association between investor's demographics (gender, marital status, age, income, education, and number of family), choice of financial products (bank products, physical assets and capital market instruments) and risk tolerance of an investor (risk seeker and averse). The study showed the significant connection between investors' investment choice and risk tolerance
(Bajtelsmit & Bernasek, 1996).
Ronay and Yeong(2006) suggested that measuring individual variations in risk-taking propensity within laboratory contexts alone could be misleading. At least in the case of males, it appeared that individuals' attitudes towards risky decisions could significantly deviate from their explicitly expressed attitudes when placed in a group context.

**Age:** An important criteria in financial investment decision from individual's as well as investment manager's perspective. Age decides the further time left to meet investment objectives and and to recoup financial losses. Also the risk tolerance capacity of as per previous reviews says, decreases with age(Wallach & Kogan, 1961; Botwinick, 1966; Vroom & Pahl, 1971; Baker & Haslem, 1974; Bossons, 1973; Lease, Lewellen & Schlarbaum, 1974; Okun & DiVesta, 1976; Bajtelsmit & VanDerhei, 1997; Bakshi & Chen, 1994; Brown, 1990; Dahlback, 1991; Goodfellow & Schieber, 1997; Hawley & Fujii, 1993-1994; McInish, 1982; Morin & Suarez, 1983; Palsson, 1996; Sung & Hanna, 1996a; Parkash, Awais, & Warraich, 2014; Mittal & Vyas, 2007).
Korniotis and Kumar (2011) also examined older investors to find their decisions making dynamics. Many researcher of psychology agree that decision making capabilities deteriorate as people get older depending upon the mental health of individuals.

Contrary to above researches Wang and Hanna (1997) concluded that relative risk aversion decreased as people aged. Grable and Lytton (1999) concluded that the classes of risk tolerance (i.e., above and below-average) differed most widely on a respondent's educational level and personal finance knowledge.
The age groups used (in Indian context) for the study are: Age 18-27yrs; 28-37yrs, 38-47 yrs, 48yrs and above.

**Income:** Another important criteria for financial decision making and defining the psychology of an individual is income. Higher income leads to availabilty of funds for investmenta and make individual more confident for risk bearing. (Blume, 1978; Cicchetti & Dubin, 1994; Cohn, Lewellen, Lease & Schlarbaum, 1975; Friedman & Roseman, 1974; Goodfellow & Schieber, 1997; Hawley & Fujii, 1993-1994; Lee & Hanna, 1991; Riley & Chow, 1992; Schooley & Worden, 1996; Shaw, 1996; Xiao & Noring, 1994; MacCrimmon & Wehrung, 1986). The income groups considered in the study are as: Income less than 1lakh rupees per year=1; 1 lakh – 2lakh; 2-3 lakhs; 3lakhs or more= 4

**Education:** Increased level of education leads to more awareness about various avenues where funds can be invested. Individual through good and practical qualification is able to analyze risk more properly and make better choices for investment avenues (MacCrimmon & Wehrung, 1986; Baker & Haslem, 1974; Haliassos & Bertaut, 1995; Hammond, Houston, & Melander, 1967; Lee & Hanna, 1995; Masters, 1989; Shaw, 1996; Sung & Hanna, 1996a, 1996b; Zhong & Xiao, 1995, Geetha & Ramesh, 2011, Jain & Mandot, 2012).
Based on the above review, in the current research we have used four respondents groups based on their qualification. The qualification groups coded are: Intermediate/ 12th pass; Graduate ; Post-graduate and Others.
In addition to these researches Lu (2011) reported the determinants of people's decisions to take loans, borrow pension plan and Celo (2011) worked on the understanding of how decisions for international investments are made and how this affects the overall pattern of investments and firm's performance is of particular importance both in strategy and international business research. Chandra (2008) found that unlike the classical finance theory suggests, individual investors do not always make rational investment decisions. Their investment decision-making is influenced, to a great extent, by behavioural factors like greed and fear, cognitive dissonance, heuristics, mental accounting, and anchoring. These behavioural factors must be taken into account as risk factors while making investment decisions. Investment advisors and finance professionals must incorporate behavioural issues as risk factors in order to formulate effective investment strategies for individual investors. JABES studied that   human psychology has a role to play in influencing investing strategies and investment decisions. It is evident from the findings  that majority of those who engage in investments have some work experience in finance which is positively correlated to the one's interest in investment activities and are more likely to involve themselves in investment than those without experience in that field. Also he founded that investment decisions are quite more often influenced by investment objectives.
Riaz, Hunjra, and Azam (2012) concluded that the investor's behavior depends on how the available information is being presented to them and how much they are prone to taking risk while making decisions; thus playing a significant role in determining the investment style of an investor. TUDORAN studied the influence of feelings and emotions of investors on prices of financial Those who are able to make decisions and have a high aversion to risk in the past, are likely to continue to take prudent decisions while policy makers with low aversion to risk in the past, are likely to continue to take risky decisions and adventurous. Risk-taking is an important financial decisions. Women, parents, and older people are less likely to take risks Consumers and investors with a high degree of confidence in the future are more likely to take risks. Overestimated confidence and optimism are other psychological factors that lead people to take financial risks, with potentially disastrous consequences for their financial situation.
Alnajjar (2003) study confirmed the irrational behavior of investor while investing in stock market. Like information asymmetry is negatively associated with risk perception, the reliance of investor risk associated with investment on the government policies and positive association between risk perception and return expectations.
Gärling et al. (2010) reviewed, evaluates, and discussed both psychological antecedents and consequences of financial crises. Chang (1962) investigated psychological factors influencing individuals' investment decision-making.  The results revealed that there exist a statistically significant relationship between five psychological factors and investment decision-making. Investors are likely to consider a product with different functions as one with different mental accounts (gains). Ehm, Kaufmann, and Weber (2011) found that mainly investors' risk attitude, but also their risk perception and the investment horizon are good predictors for risk taking. Indeed, investors do not appear to be naïve, but they do something sensible. Overall, people seem to use two mental accounts – one for the risk-free and one for the risky investment with the risk attitude determining the percentage allocation, and not the overall volatility of the investment.

Fischer and Gerhardt (2007) demonstrated and analyzed deviations in individual investors' investment decisions from recommendations of financial theory. They show that deviations from theory lead to considerable welfare losses. Therefore they present financial advice as (potentially) correcting factor in this process and construct a simple model to capture its very impact on individual investors' investment success, measured in risk-adjusted return and wealth.

Several other researchers have also tried understanding the process of decision making like Coleman (1994) through the research tried to understand the mechanisms of the biases using a study of decision making by Australian finance executives, Pellinen et al. (2011), that of mutual fund investors and compared internet and branch office investors, Yazdipou and Rossel (2009), focused on individual decision making under highly uncertain entrepreneurial environments, Jain and Dashora (2012) analysed the rationality of the investors of Udaipur during different market expectations, dividend and bonus announcements, the impact of age, income levels and other market related information on investment decisions of investors from Udaipur.

## 3. Significance

After doing the extensive review of literature on the topic we found that different people have different psychology and they make their financial decision according to their psycho (nature). Since psychology is the branch of philosophy, so it can be used for the "interpretation, prediction, development, and improvement of human behavior. "Financial decision making is the process of selecting a logical choice from the available options and from the available option to select  which option is the best for that particular situation, after then the investors invest and we know that many aspects of investment analysis are psychological in nature, thus  Investor Psychology and Financial Decision-Making  is  inter-related to each-other. The present research will contribute to the development of this relationship in Indian context. Till now extensive review is available on the factors forming Investor Physcology and different factors influencing decision making but very few studies available have contributed to empirical aspect. This research will be empirical efforts in Indian context for analyzing this relationship. The results will be helpful to researchers as well as students for understanding such relationships and for organizations for developing marketing strategies for financial products.

## 4. Objectives

1:- To design, develop and standardized a measure for Financial Decision Making.
2:- To design, develop and standardized a measure for Investors Psychology.
3:-To identify the factors of Investors' Psychology.
4:- To identify the factors of Financial Decision Making.
5:-To, find out cause an effect relationship between Investors Psychology and Financial Decision Making.
6:-To identify avenue for future research.

## 5. Research Methodology

The study was exploratory in nature. Survey method was used to complete it. All the residents of Gwalior city acted as population of study. All the investors (who have taken any kind of financial Decision) acted as sampling frame for the study. Individual respondent acted as sampling element. Sample size was of 300 respondents including 150 males and 150 females. Non-probability quota sampling method was used. For the purpose of data collection, two self designed questionnaires were used. One questionnaire was of Investor's Psychology and another of  Financial Decision Making. The scale was Likert type and possessed a sensitivity of 5, where the extreme values namely 1 and 5 represented least agreement and most agreement respectively. Reliability Test was applied to check to reliability of both the questionnaires with the help of Cronbach Alpha. Factor analysis was applied to find act the underlying factor of Financial Decision Making as well as Investors Psychology respectively. Linear regression was used to find out cause and effect relationship between Financial Decision Making and Investor's Psychology. Manova test was used to find out difference on different categorical variable for Investor Psychology and Financial Decision making.

# 6. Discussion/Interpretations of Results

### 6.1. Reliability (Investors Psychology)

Cronbach's Alpha method has been applied to calculate reliability of all items in the questionnaire. Reliability test using SPSS software and the reliability test measure is given below:

**Table 1: Reliability measure of investor's psychology and financial decision making**

| Cronbach's Alpha | N of Items |
|---|---|
| .751 | 10 (**investor's psychology**) |
| .794 | 11 (**financial decision making**) |

Reliability for both the questionnaire came out to be more than .7 which indicates questionnaires are reliable for the study.

### 1. Factor Analysis

**KMO and Bartlett's Test and Factor Analysis for investor's psychology**
**KMO and Bartlett's Test:** KMO sampling adequacy test shows sample is adequate for carrying out factor analysis. Principle component factor analysis with Varimax rotation and Kaiser Normalization was Period details about factors, the factor name variable number and convergence and that Eigen Value are given in the table.

**Table 2: KMO Table**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .769 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 611.329 |
| | Df | 45 |
| | Sig. | .000 |

**Table 3: Factor (Investors Psychology)**

| Factor Name | Eigen Value | | Variable Convergence/ Statement | Loadings Value |
|---|---|---|---|---|
| | Total | % of variance | | |
| Institutive and judgmental | 31.238 | 23.660 | 1. Thinking hard and for a long time about something give me little satisfaction. | .758 |
| | | | 3. I prefer to do something that challenges my thinking abilities rather than something that | .823 |

| | | | | |
|---|---|---|---|---|
| | | | requires little through.<br>5. I prefer complex to simple problems.<br>7. When it comes to trusting people I can usually rely on my "gut feelings". | .748<br>.591 |
| Courteous presentation | 1.707 | 17.072 | 6. I try to avoid situation that require thinking in depth about something.<br>8. My initial impressions of people are almost always right.<br>10. I can usually feel when a person is right or wrong even if I can't explain how I know. | .654<br><br>.690<br><br><br>.795 |
| Trusting intuition | 1.197 | 9.208 | 02. I trust my initial feelings about people.<br>04. I believe in trusting my hunches.<br>09. I don't like to have to do a lot of thinking. | .706<br><br>.660<br>.567 |
| | | | | |

### 6.2. Description of factor analysis: Financial Awareness

**1. Institutive and Judgmental**: the most important factor that come out of the study "Institutive and judgmental" which comprise of 3 variables and explains 23.660% of variance. Total Eigen value is 31.238. The included variables are "Thinking hard and for a long time about something give me little satisfaction."(.758), "I prefer to do something that challenges my thinking abilities rather than something that requires little through."(.823), "I prefer complex to simple problems."(.748), "When it comes to trusting people I can usually rely on my "gut feelings"."(.591).

**2. Courteous Presentation:-** the second important factor is "Courteous presentation" which comprise of 3 variables and explains 17.072% of variance. Total Eigen value is 1.707 The included variables are "I try to avoid situation that require thinking in depth about something."(.654), "My initial impressions of people are almost always right."(.690), "I can usually feel when a person is right or wrong even if I can't explain how I know." (.795).

**3. Trusting Intuition:-** The third important factor is "Trusting intuetion" which comprise of 2 variables and explains 9.208 % of variance. Total Eigen value is 1.197. The included variables are "I trust my initial feelings about people." (.706), "I believe in trusting my hunches." (.660). I don't like to have to do a lot of thinking.(.567)

### 2. Factor Analysis: (financial decision making)

**KMO and Bartlett's Test and Factor Analysis for Attitude of Credit Card:**
**KMO and Bartlett's Test:** KMO sampling adequacy test shows sample is adequate for carrying out factor analysis. Principle component factor analysis with Varimax rotation and Kaiser Normalization was Period details about factors, the factor name variable number and convergence and that Eigen Values are given in the table.

**Table 4: KMO Table**

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .793 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 792.174 |
| | Df | 55 |
| | Sig. | .000 |

**Table 5: Factors (Financial Decision Making)**

| Factor Name | Eigen Value | | Variable Convergence/ Statement | Loadings Value |
|---|---|---|---|---|
| | Total | % of variance | | |
| Endowment management | 2.503 | 22.757 | 11. I have sufficient financial management knowledge. | .713 |
| | | | 13. My investment in stocks has been successful. | .800 |
| | | | 15. My investment in futures and options have been successful. | .759 |
| | | | 17. i must bear the risk for any failure to meet the forecast interest. | .556 |
| | | | 21. i do not think the regulatory system for time deposits is sufficiently strict. | .475 |
| Term deposit | 1.870 | 16.998 | 12. My fixed deposit investments have been success. | .792 |
| | | | 14. My investments in investment insurance policies have been successful. | .543 |
| | | | 19. The returns from time deposits have changed considerably in recent times. | .667 |
| Investment analysis | 1.808 | 16.434 | 16. I have to be prepaid to loss some of my investment. | .689 |
| | | | 18. In the information provided for this investment type is sufficient. I would feel the investment were unsafe. | .723 |
| | | | 20. I was to invest in time deposits. I would feel concerned about risk. | .673 |

**6.3. Description of Factors**:

**1. Endowment Management: -** the most important factor that come out of the study "Endowment management" which comprise of 3 variables and explains 22.757 % of variance. Total Eigen value is 2.503. The included variables are "I have sufficient financial management knowledge."(.713), "my investment in stocks has been successful."(.800), "my investments in futures and options have been successful."(.759), I must bear the risk for any failure to meet the forecast interest (.556) and I do not think the regulatory system for time deposits is sufficiently strict (.475).

**2. Term Deposit: -** the second important factor is "Term deposit" which comprise of 4 variables and explains 16.998 % of variance. Total Eigen value is 1.870 the included variables are "My fixed deposit investments have been success."(.792), my investments in investment insurance policies have been successful."(.543), "The returns from time deposits have changed considerably in recent times." (.667).

**3. Investment Analysis: -** The third important factor is "Investment analysis" which comprise of 4 variables and explains 16.434% of variance. Total Eigen value is 1.808. The included variables are "I have to be prepaid to loss some of my investment" (.689), "In the information provided for this investment type is sufficient. I would feel the investment were unsafe" (.723), "I was to invest in time deposits, I would feel concerned about risk. (.673).

**Non-Parametric Test: KS Test:-** KS test was carried out to check the normality of the data. Null hypothesis checked here was : The test distribution is normal.

**Table 6: One-Sample Kolmogorov-Smirnov Test**

|  |  | invtphy | financialdm |
|---|---|---|---|
| N |  | 300 | 300 |
| Normal Parameters[a,b] | Mean | 37.7233 | 41.6600 |
|  | Std. Deviation | 5.56988 | 6.22524 |
| Most Extreme Differences | Absolute | .132 | .152 |
|  | Positive | .090 | .094 |
|  | Negative | -.132 | -.152 |
| Kolmogorov-Smirnov Z |  | 2.294 | 2.625 |
| Asymp. Sig. (2-tailed) |  | .000 | .000 |

From the about table it can be seen that KS test Z value for investor psychology and financial decision making is respectively 2.294 and 2.265 at 0 % significance. This means that test distribution is **not normal**. For finding out differences between different age, qualification, income and gender groups, further non-parametric tests were applied.

### 6.4. Univariate Analysis of Variance

It is a statistical technique that is intended to analyze variability in data in order to infer the inequality among population means.

*Levene's Test of Equality of Error Variances*: Tests the null hypothesis that the error variance of the dependent variable (Investor Psychology) is equal across groups of age, income, sex and education. The thing to focus on is the "Sig." value. Here .104 is clearly not significant, so we have no reason to doubt the assumption of homogeneity of variance.

### 6.5. Levene's Test of Equality of Error Variances[a]

**Table 6: Dependent Variable:  investor psychology**

| F | df1 | df2 | Sig. |
|---|---|---|---|
| 1.257 | 74 | 225 | .104 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.[a]

a. Design: Intercept + age + sex + qualification + income + age * sex + age * qualification + age * income + sex * qualification + sex * income + qualification * income + age * sex * qualification + age * sex * income + age * qualification * income + sex * qualification * income + age * sex * qualification * income

### 6.6. Tests of Between-Subjects Effects:

Tests of Between-Subjects Effects

**Table 7: Dependent Variable; investor phycology**

| Source | Type III Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1123.230[a] | 74 | 15.179 | 1.446 | .021 |
| Intercept | 71534.771 | 1 | 71534.771 | 6812.788 | .000 |
| age | 56.601 | 3 | 18.867 | 1.797 | .149 |
| sex | 7.682E-005 | 1 | 7.682E-005 | .000 | .998 |
| qualification | 10.602 | 3 | 3.534 | .337 | .799 |
| income | 49.511 | 4 | 12.378 | 1.179 | .321 |
| age * sex | 24.419 | 3 | 8.140 | .775 | .509 |
| **age * qualification** | 249.960 | 8 | 31.245 | 2.976 | .003 |
| age * income | 81.081 | 9 | 9.009 | .858 | .564 |
| sex * qualification | 7.727 | 3 | 2.576 | .245 | .865 |
| sex * income | 75.999 | 4 | 19.000 | 1.809 | .128 |
| qualification * income | 58.327 | 10 | 5.833 | .555 | .849 |
| age * sex * qualification | 55.677 | 4 | 13.919 | 1.326 | .261 |
| age * sex * income | 71.782 | 5 | 14.356 | 1.367 | .238 |
| **age * qualification * income** | 211.982 | 8 | 26.498 | 2.524 | .012 |
| sex * qualification * income | 18.586 | 5 | 3.717 | .354 | .879 |
| age * sex * qualification * income | 6.303 | 1 | 6.303 | .600 | .439 |
| Error | 2362.516 | 225 | 10.500 | | |
| Total | 275048.000 | 300 | | | |
| Corrected Total | 3485.747 | 299 | | | |

the "Sig." column and notice that the only two main effects (**age * qualification** and **age * qualification * income**) are significant and that their interaction is highly significant. This means that between different age groups, income groups, qualification groups and sex, there is not much difference in investor psychology. But when combined interaction of age and qualification and that of age, qualification and income is checked, the effect is significant.

### 6.7. Post Hoc Tests

For further finding of the detailed pattern of results in different groups or sub groups of the population specifically, post hoc test was applied. Here adopted procedure is Tukey HSD.  Tukey's procedure is only applicable for pairwise comparisons.  It assumes independence of the observations being tested, as well as equal variation across observations (homoscedasticity).

The age group coded here are as follows:
Age 18-27yrs=1
28-37yrs= 2
38-47 yrs=3
48yrs and above=4
From the table it can be seen that results are significant between age group 1 and 4;  2 and 3; 2 and 4; 3 and 2; 4 and 1; 4 and 2.

### 6.8. Multiple Comparisons

**Table 8: Dependent Variable:  investorphycology**

| | (I) age | (J) age | Mean Difference (I-J) | Std. Error | Sig. | 95%  Confidence Interval |
|---|---|---|---|---|---|---|
| | | | | | | Lower Bound |
| Tukey HSD | 1 | 2 | -.38 | .485 | .860 | -1.64 |
| | | 3 | .97 | .477 | .175 | -.26 |
| | | **4** | **1.85***  | **.670** | **.032** | .12 |
| | 2 | 1 | .38 | .485 | .860 | -.87 |
| | | **3** | **1.36***  | **.492** | **.032** | .08 |
| | | **4** | **2.23***  | **.681** | **.007** | .47 |
| | 3 | 1 | -.97 | .477 | .175 | -2.21 |
| | | **2** | **-1.36***  | **.492** | **.032** | -2.63 |
| | | 4 | .88 | .675 | .565 | -.87 |
| | 4 | **1** | **-1.85***  | **.670** | **.032** | -3.59 |
| | | **2** | **-2.23***  | **.681** | **.007** | -3.99 |
| | | 3 | -.88 | .675 | .565 | -2.62 |
| LSD | 1 | 2 | -.38 | .485 | .432 | -1.34 |
| | | 3 | .97*  | .477 | .042 | .04 |
| | | 4 | 1.85*  | .670 | .006 | .53 |
| | 2 | 1 | .38 | .485 | .432 | -.57 |
| | | 3 | 1.36*  | .492 | .006 | .39 |
| | | 4 | 2.23*  | .681 | .001 | .89 |
| | 3 | 1 | -.97*  | .477 | .042 | -1.91 |
| | | 2 | -1.36*  | .492 | .006 | -2.33 |
| | | 4 | .88 | .675 | .196 | -.45 |
| | 4 | 1 | -1.85*  | .670 | .006 | -3.17 |
| | | 2 | -2.23*  | .681 | .001 | -3.57 |
| | | 3 | -.88 | .675 | .196 | -2.21 |

**Qualification:Post Hoc Tests**

For further finding of the detailed pattern of results in different groups or sub groups of the population specifically, post hoc test was applied for qualification as categorical variable.  The qualification groups coded are:
Intermediate/ 12th pass=1
Graduate-=2
Post-graduate= 3
Others= 4
From the table it can be seen that results are not significant between any of the education groups.

**Multiple Comparisons**

**Table 9: Dependent Variable:  investorphycology**

| | (I) qualification | (J) qualification | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|---|
| Tukey HSD | 1 | 2 | .46 | .792 | .937 |
| | | 3 | .62 | .770 | .854 |

| | (I) | (J) | | | |
|---|---|---|---|---|---|
| | | 4 | .97 | .792 | .613 |
| | | 1 | -.46 | .792 | .937 |
| | 2 | 3 | .16 | .468 | .987 |
| | | 4 | .51 | .503 | .746 |
| | | 1 | -.62 | .770 | .854 |
| | 3 | 2 | -.16 | .468 | .987 |
| | | 4 | .35 | .468 | .877 |
| | | 1 | -.97 | .792 | .613 |
| | 4 | 2 | -.51 | .503 | .746 |
| | | 3 | -.35 | .468 | .877 |
| | | 2 | .46 | .792 | .561 |
| | 1 | 3 | .62 | .770 | .424 |
| | | 4 | .97 | .792 | .223 |
| | | 1 | -.46 | .792 | .561 |
| LSD | 2 | 3 | .16 | .468 | .740 |
| | | 4 | .51 | .503 | .315 |
| | | 1 | -.62 | .770 | .424 |
| | 3 | 2 | -.16 | .468 | .740 |
| | | 4 | .35 | .468 | .455 |
| | | 1 | -.97 | .792 | .223 |
| | 4 | 2 | -.51 | .503 | .315 |
| | | 3 | -.35 | .468 | .455 |

**Income- Post Hoc Tests**

For further finding of the detailed pattern of results in different groups or sub groups of the population specifically, post hoc test was applied. The income group coded are as:

Income less than 1lakh rupees per year=1

1 lakh – 2lakh= 2

2-3 lakh=3

3lakhs or more= 4

From the table it can be seen that results are not significant between any of the income groups.

**Levene's Test of Equality of Error Variances:** Tests the null hypothesis that the error variance of the dependent variable (Financial Decision Making) is equal across groups of age, income, sex and education. The thing to focus on is the "Sig." value. Here .060 is clearly not significant, so we have no reason to doubt the assumption of homogeneity of variance.

**Levene's Test of Equality of Error Variances**

**Table 10: Dependent Variable:  financial decision making**

| F | df1 | df2 | Sig. |
|---|---|---|---|
| 1.327 | 74 | 224 | .060 |

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.[a]

a. Design: Intercept + age + sex + qualification + income + age * sex + age * qualification + age * income + sex * qualification + sex * income + qualification * income + age * sex * qualification + age * sex * income + age * qualification * income + sex * qualification * income + age * sex * qualification * income

**Tests of Between-Subjects Effects**

**Table 11: Dependent Variable: financial decision making**

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1393.673[a] | 74 | 18.833 | 1.195 | .163 |
| Intercept | 87914.937 | 1 | 87914.937 | 5579.119 | .000 |
| age | 48.431 | 3 | 16.144 | 1.024 | .383 |
| sex | 18.298 | 1 | 18.298 | 1.161 | .282 |
| qualification | 75.229 | 3 | 25.076 | 1.591 | .192 |
| income | 105.435 | 4 | 26.359 | 1.673 | .157 |
| age * sex | 43.636 | 3 | 14.545 | .923 | .430 |
| age * qualification | 56.778 | 8 | 7.097 | .450 | .890 |
| age * income | 139.620 | 9 | 15.513 | .984 | .454 |
| sex * qualification | 87.178 | 3 | 29.059 | 1.844 | .140 |
| sex * income | 54.071 | 4 | 13.518 | .858 | .490 |
| qualification * income | 107.449 | 10 | 10.745 | .682 | .741 |
| age * sex * qualification | 62.354 | 4 | 15.588 | .989 | .414 |
| age * sex * income | 62.905 | 5 | 12.581 | .798 | .552 |
| age * qualification * income | 192.914 | 8 | 24.114 | 1.530 | .148 |
| sex * qualification * income | 36.223 | 5 | 7.245 | .460 | .806 |
| age * sex * qualification * income | 22.900 | 1 | 22.900 | 1.453 | .229 |
| Error | 3529.759 | 224 | 15.758 | | |
| Total | 334905.000 | 299 | | | |
| Corrected Total | 4923.431 | 298 | | | |

the "Sig." column and notice that no effects are significant here and that their interaction among different categorical variables is not at all significant. This means that there is not much difference in financial decision making based on age, income qualification and sex.

**Post Hoc Tests for Financial Decision Making**
For further finding of the detailed pattern of results in different groups or sub groups of the population specifically, post hoc test was applied. Here adopted procedure is Tukey HSD. Tukey's procedure is only applicable for pairwise comparisons. It assumes independence of the observations being tested, as well as equal variation across observations (homoscedasticity).

**Post Hoc Tests: Age**
The age group coded here are as follows:
Age 18-27yrs=1
28-37yrs= 2
38-47 yrs=3
48yrs and above=4
From the table it can be seen that the different sub groups for age do not have significant results.

**Multiple Comparisons**

**Table 12: Dependent Variable: financial decision making**

| | (I) age | (J) age | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval |
|---|---|---|---|---|---|---|
| | | | | | | Lower Bound |
| Tukey HSD | 1 | 2 | .67 | .596 | .671 | -.87 |

| | (I) | (J) | | | |
|---|---|---|---|---|---|
| | | 3 | -.11 | .584 | .997 | -1.62 |
| | | 4 | .45 | .821 | .946 | -1.67 |
| | 2 | 1 | -.67 | .596 | .671 | -2.22 |
| | | 3 | -.79 | .604 | .563 | -2.35 |
| | | 4 | -.22 | .836 | .994 | -2.38 |
| | 3 | 1 | .11 | .584 | .997 | -1.40 |
| | | 2 | .79 | .604 | .563 | -.78 |
| | | 4 | .57 | .827 | .903 | -1.57 |
| | 4 | 1 | -.45 | .821 | .946 | -2.58 |
| | | 2 | .22 | .836 | .994 | -1.94 |
| | | 3 | -.57 | .827 | .903 | -2.71 |
| | 1 | 2 | .67 | .596 | .260 | -.50 |
| | | 3 | -.11 | .584 | .848 | -1.26 |
| | | 4 | .45 | .821 | .581 | -1.16 |
| | 2 | 1 | -.67 | .596 | .260 | -1.85 |
| LSD | | 3 | -.79 | .604 | .194 | -1.98 |
| | | 4 | -.22 | .836 | .792 | -1.87 |
| | 3 | 1 | .11 | .584 | .848 | -1.04 |
| | | 2 | .79 | .604 | .194 | -.40 |
| | | 4 | .57 | .827 | .495 | -1.06 |
| | 4 | 1 | -.45 | .821 | .581 | -2.07 |
| | | 2 | .22 | .836 | .792 | -1.43 |
| | | 3 | -.57 | .827 | .495 | -2.19 |

**Post Hoc Tests: Qualification**

For further finding of the detailed pattern of results in different groups or sub groups of the population specifically, post hoc test was applied for qualification as categorical variable. The qualification groups coded are:

Intermediate/ $12^{th}$ pass=1

Graduate: 2

Post-graduate: 3

Others= 4

From the table it can be seen that results are not significant between any of the education groups except between group 3 and 4.

**Multiple Comparisons**

**Table 13: Dependent Variable: financial decision making**

| | (I) qualification | (J) qualification | Mean Difference (I-J) | Std. Error | Sig. |
|---|---|---|---|---|---|
| | | 2 | -.27 | .970 | .993 |
| | 1 | 3 | .72 | .943 | .872 |
| Tukey HSD | | 4 | -1.00 | .971 | .730 |
| | 2 | 1 | .27 | .970 | .993 |
| | | 3 | .98 | .574 | .318 |

| | | | | | |
|---|---|---|---|---|---|
| | | 4 | -.74 | .618 | .633 |
| | | 1 | -.72 | .943 | .872 |
| | 3 | 2 | -.98 | .574 | .318 |
| | | **4** | **-1.72*** | **.576** | **.016** |
| | | 1 | 1.00 | .971 | .730 |
| | 4 | 2 | .74 | .618 | .633 |
| | | 3 | 1.72* | .576 | .016 |
| | | 2 | -.27 | .970 | .783 |
| | 1 | 3 | .72 | .943 | .447 |
| | | 4 | -1.00 | .971 | .302 |
| | | 1 | .27 | .970 | .783 |
| | 2 | 3 | .98 | .574 | .088 |
| LSD | | 4 | -.74 | .618 | .235 |
| | | 1 | -.72 | .943 | .447 |
| | 3 | 2 | -.98 | .574 | .088 |
| | | 4 | -1.72* | .576 | .003 |
| | | 1 | 1.00 | .971 | .302 |
| | 4 | 2 | .74 | .618 | .235 |
| | | 3 | 1.72* | .576 | .003 |

**Post Hoc Tests: Income**

For further finding of the detailed pattern of results in different groups or sub groups of the population specifically, post hoc test was applied.  The income group coded are as:

Income less than 1lakh rupees per year=1

1 lakh – 2lakh= 2

2-3 lakh =3

3lakhs or more= 4

From the table it can be seen that results are not significant between any of the income groups.

**Multiple Comparisons**

**Table 14: Dependent Variable:   financial decision making**

| | (I) income | (J) income | Mean Difference (I-J) | Std. Error | Sig. | 95%  Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| | | 1 | .65 | .681 | .874 | -1.22 | 2.53 |
| | 0 | 2 | 1.59 | .744 | .208 | -.46 | 3.64 |
| | | 3 | .43 | .833 | .986 | -1.86 | 2.72 |
| | | 4 | 1.88 | 1.209 | .528 | -1.45 | 5.20 |
| | | 0 | -.65 | .681 | .874 | -2.53 | 1.22 |
| | 1 | 2 | .94 | .590 | .505 | -.68 | 2.56 |
| Tukey HSD | | 3 | -.22 | .698 | .998 | -2.14 | 1.70 |
| | | 4 | 1.23 | 1.120 | .809 | -1.85 | 4.31 |
| | | 0 | -1.59 | .744 | .208 | -3.64 | .46 |
| | 2 | 1 | -.94 | .590 | .505 | -2.56 | .68 |
| | | 3 | -1.16 | .760 | .546 | -3.25 | .93 |
| | | 4 | .29 | 1.159 | .999 | -2.90 | 3.48 |
| | 3 | 0 | -.43 | .833 | .986 | -2.72 | 1.86 |
| | | 1 | .22 | .698 | .998 | -1.70 | 2.14 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 2 | 1.16 | .760 | .546 | -.93 | 3.25 |
| | | 4 | 1.45 | 1.218 | .758 | -1.90 | 4.80 |
| | | 0 | -1.88 | 1.209 | .528 | -5.20 | 1.45 |
| | 4 | 1 | -1.23 | 1.120 | .809 | -4.31 | 1.85 |
| | | 2 | -.29 | 1.159 | .999 | -3.48 | 2.90 |
| | | 3 | -1.45 | 1.218 | .758 | -4.80 | 1.90 |
| | | 1 | .65 | .681 | .339 | -.69 | 2.00 |
| | 0 | 2 | 1.59* | .744 | .034 | .12 | 3.06 |
| | | 3 | .43 | .833 | .606 | -1.21 | 2.07 |
| | | 4 | 1.88 | 1.209 | .122 | -.50 | 4.26 |
| | | 0 | -.65 | .681 | .339 | -2.00 | .69 |
| | 1 | 2 | .94 | .590 | .113 | -.22 | 2.10 |
| | | 3 | -.22 | .698 | .751 | -1.60 | 1.15 |
| | | 4 | 1.23 | 1.120 | .275 | -.98 | 3.43 |
| | | 0 | -1.59* | .744 | .034 | -3.06 | -.12 |
| LSD | 2 | 1 | -.94 | .590 | .113 | -2.10 | .22 |
| | | 3 | -1.16 | .760 | .128 | -2.66 | .34 |
| | | 4 | .29 | 1.159 | .804 | -2.00 | 2.57 |
| | | 0 | -.43 | .833 | .606 | -2.07 | 1.21 |
| | 3 | 1 | .22 | .698 | .751 | -1.15 | 1.60 |
| | | 2 | 1.16 | .760 | .128 | -.34 | 2.66 |
| | | 4 | 1.45 | 1.218 | .236 | -.95 | 3.85 |
| | | 0 | -1.88 | 1.209 | .122 | -4.26 | .50 |
| | 4 | 1 | -1.23 | 1.120 | .275 | -3.43 | .98 |
| | | 2 | -.29 | 1.159 | .804 | -2.57 | 2.00 |
| | | 3 | -1.45 | 1.218 | .236 | -3.85 | .95 |

Based on observed means.
 The error term is Mean Square(Error) = 15.758.
*. The mean difference is significant at the .05 level.

## 6.9. Correlation

Correlation refers to any of a broad class of statistical relationships involving dependence. Correlations are useful because they can indicate a predictive relationship that can be exploited in practice. The most common of these is the Pearson correlation coefficient, which is sensitive only to a linear relationship between two variables. If the variables are independent, Pearson's correlation coefficient is 0, but the converse is not true because the correlation coefficient detects only linear dependencies between two variables i.e. investor psychology and decision making .

**Table 15: Correlations**

| | | investpshcology | Decision making |
|---|---|---|---|
| Investpshcology | Pearson Correlation | 1 | .240** |
| | Sig. (2-tailed) | | .000 |
| | N | 300 | 300 |
| Decision making | Pearson Correlation | .240** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 300 | 300 |

**. Correlation is significant at the 0.01 level (2-tailed).

From the above table it can be seen pearson correlation coefficient is .240. This means correlation coefficient detects linear dependencies between two variables.

**Implications:** This study can useful because it tells the company about whether they are capable according to the customer requirements about credit card. It also indicates the gap between the company think they are providing to the customer and what customer actually need. This study is a useful contribution for the Academicians and Research Scholars for the evaluation of the Financial Decision Making and Investor Psychology. The study can be useful to set some standards to Financial Decision Making.

## 7. Conclusion

Extensive review of existing literature has lead to the inference that the decision-making by individual investors is usually based on their age, education, income, gender, investment portfolio, and other demographic factors. Though the impact of behavioural aspect of investment and decision making is, however, often ignored, the objective of present research this paper is to explore the impact of investors' psychology on their decision-making. Further in the study we have tried to find out the factors underlying investor psychology & decision making and impact of different categorical demographic variables on investor psychology & decision making.

The research uses the literature relevant to decision-making and investor's psychology. The research is based on the primary data collected through self developed instruments of measuring investor psychology & decision making. Different statistical tests were applied to fulfill the objectives of study.

The study resulted in three factors for investor psychology (Institutive and judgmental, Courteous presentation and trusting intuition) and three for decision making (Endowment management, Term deposit and Investment analysis). Further when difference between different age, income, qualification, gender groups on investor psychology and decision making was checked, the same were surprising as they didn't match much with the existing literature. When variance between different groups of age, qualification, gender and income was checked for investor psychology and financial decision making, it was found to be none. But interaction effect was observed between age & qualification and age, qualification & income.

Further when variance was checked between different sub groups of age for investor psychology, variance was found between investors of age group 18-27yrs and 48yrs and above. The same was for 28-37yrs and 38-47yrs age group, 28-37ysr and 48yrs and above age group. For Financial decision making the difference was only between age group 38-47yrs and 48yrs and above. When relationship was checked for investor psychology and for decision making, it was found that both are dependent on each other.

Through this research, the author finds that unlike the classical finance theory suggests, individual investors do not always make rational investment decisions. Their investment decision-making is influenced, to a great extent, by behavioural factors like greed and fear, cognitive dissonance, heuristics, mental accounting, and anchoring. These behavioural factors must be taken into account as risk factors while making investment decisions. Investment advisors and finance professionals must incorporate behavioural issues as risk factors in order to formulate effective investment strategies for individual investors.With an objective to create investor's confidence in the stock market, behavioural issues are the newest of the things which must be considered while formulating investment strategies. This research will help investment advisors and finance professionals judge investor's attitude towards risk in a better way, thus leading to better investment decision-making.

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