

Influence of Heuristics on Individual Investors Rationality

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Abstract

To take sound and rational financial decisions is a cherished goal for every human being. The efforts and mental balance required to take such decisions is usually replaced by the use of rules of thumb in one's day-to-day life. Researchers have been trying hard to study the contours of individuals' psychological traits and the investment decisions, which actually form the subject matter of behavioral finance. It is believed that the use of such short-cut methods have a significant influence on the rationality of individual investors. It is against this backdrop, that the present study makes an attempt to examine the impact of the use of Heuristics on the rationality of the financial decisions of individual investors. The study is broadly based on the primary data collected through a well-structured questionnaire from a sample of active individual investors in Jammu and Kashmir. The objectives of the study are achieved by using T-test, F-test, and Correlation Analysis. The results of the study reveal that "heuristics" significantly affect the rationality of the financial decisions of the investors.

Key Words: Rationality, Heuristics, Psychological Traits.

Introduction:

Human beings are well known for their natural propensity for irrational behavior and to take financial decisions only on the basis of standard finance theories is a Hobson's task because of such a behavior of human beings. Rational decision making demands obeying some basic rules like Completeness, Transitivity, Non-satiation and Convexity (**Levin & Milgrom, 2004**). Completeness means if a consumer is given two goods, he can either make preference between them and choose one or is indifferent between them as he may feel both of them has the same utility for him. Transitivity means if first commodity is preferred to second and second is preferred to third, automatically first will be preferred to third as well. Non-satiation means given the price, consumer prefers more to less. While as Convexity means as more and more quantity of a specific commodity is consumed its utility goes on decreasing. These rules may look convincing on papers but they seem obsolete in real life situations. This is primarily due to the fact that people have their own personal preferences/priorities, habits and categories

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while making choices. Again, these rules need a lot of mental exercise which human beings replaces by the short-cut methods called Heuristics in normal course of decision making.

Heuristics are simply rules of thumb or gut feeling or “X” factor that helps us to arrive at a decision, especially under the complex situations. Hence, to evaluate the impact of heuristics on the rationality of individual investors is a multi dollar research question. Therefore, this paper makes a modest attempt to study the impact of the use of Heuristics on the rationality of the financial decisions of individual investors. The basic idea behind this study is to examine as to how rationality of individual investors decisions are affected by the use of Heuristics.

Objectives of the Study:

The main objective of the study is to analyze the impact of Heuristics on the rationality of the financial decisions of individual investors. However, other specific objectives are chalked out below:

- i. To analyze whether the individual investors differ on the basis of their various demographic features in terms of the heuristics.
- ii. To analyze the impact of heuristics on the rationality of the financial decisions of individual investors.

Literature Review

Behavioral scientists criticize the standard finance theory on the pretext that it does not take into consideration the impact of psychological factors on the decisions of individual investors (**Statman, 1995**). The assumption of rational investment decision making is the back bone of standard finance theory is based has failed the test of practicality because the human decisions are affected by psychological traits (**Nofsinger, 2001**). Since irrational investors base their decisions on markets dynamics rather than fundamental analysis of the stock, the markets bubbles are formed and the prices of the stocks do not lie within the ranges proposed by the fundamental analysis or rational theories (**Bak et al, 1997**).

Humanly it is not possible to make use of all available information but with experience human beings learn the art of decision making out of the portion of this information. This gives rise to some ‘rules of thumb’ that can be used in similar situations, this phenomenon is called ‘use of heuristics’. Thus, human judgments are based on heuristics, which involve use of short cuts to arrive at decisions, under complex situations. Organizations usually rely on heuristics; under these conditions use of rational decision models seem unrealistic (**Gigerenzer&Gaissmaier, 2011**). The reason behind the use of heuristics may be explained by a theory known as ‘Attribute Substitution’, which says people often handle a complicated question by answering a different but related question, unaware about what they are doing. Use of heurists may be regarded as rational in a way as most of the times they can lead to rational decision-making without undergoing complex ways of making rational choice. An experiment was conducted by **Monti et al (2009)** wherein customers of several Italian banks were used as subjects to understand the decision making processes of the investors, the factors that influence their decisions and the information they consider or make use of while making their decisions. They found that most

investors use heuristics rather than some complex economic models while making financial decisions, also the way of presenting information affect their decisions. Heuristics are alternatives to more complicated procedures giving acceptable/satisfactory results (**Gigerenzer&Gaissmaier, 2011**). But this may not always happen and sometimes heuristics can lead to some errors known as ‘Cognitive Errors’.

Behavioural finance scientists demonstrated that wide ranges of human judgments are the products of three major heuristics i.e. Availability, Representativeness and Anchoring and Adjustment; challenging the idea that human beings are rational (**Tversky and Kahneman, 1973**). ‘Availability’ is a memory based heuristic wherein people make their decisions on the basis of what comes quickly to their mind, ‘Representativeness’ means to frame decision by considering two entities identical only because their 1 or 2 attributes are common and ignoring other information about these entities and this can lead to more accurate judgments rather than weighting and adding all information (**Gigerenzer&Gaissmaier, 2011**), and ‘Anchoring and Adjustment’ means wherein decisions are made by making adjustments to the previously set anchor. Representativeness heuristics may take many forms such as Gamblers Fallacy i.e. wherein belief is developed that if something happens more frequently today it will happen less frequently tomorrow, ‘Base Rate Fallacy’ i.e. to focus on some non-relevant information rather than the occurrence of the event itself, ‘Regression’ i.e. to believe that if a variable is extreme on its first measurement, it will tend to be closer to the average on its second measurement and vice versa and ‘Conjunction Fallacy’ i.e. to assign more probability to the joint occurrence of events that can otherwise happen jointly as well as separately. In the words of Kahneman “Heuristics are simple efficient rules of the thumb which have been proposed to explain how people make decisions, come to judgments and solve problems, typically when facing complex problems or incomplete information. These rules work well under most circumstances, but in certain cases leads to systemic cognitive biases”. Tversky argued heuristics as a strategy that usually, but not always, gives correct solutions (**Tversky and Kahneman, 1981**). Whether heuristics will lead to accurate results or otherwise depends upon the environment where they are used and with experience one can accurately judge which heuristics is to be used under what situation (**Gigerenzer&Gaissmaier, 2011**).

The behavioural bias of affect refers to the fact that individual investors become too attached to a certain type of application and thus cannot evaluate it clearly, emphasizing only the emotional advantages of the business and ignoring its financial disadvantages. Affect means the abrupt feeling that is associated with a stimulus; a person may or may not be conscious about this feeling. The studies conducted in this regard confirmed that such biases are equally present in both the genders and rules out significant effect of gender on the presence of this bias. (**Slovic et al, 2007**). This feeling influences the behavior of people, e.g. when we are happy we may feel lucky and try new things but when we are upset we may feel scared to try or do something, as our mood may affect our courage.

Forgas (2001) while proposing Affect Infusion Model (AIM) suggested the effects of our mood on our judgments become stronger in complex situations. Moreover, people while making financial decisions under very complex situations can be seen more affected with respect to their choices, as they may react to what is not actually there. Affect heuristics play a significant role in decisions regarding risks and benefits. Risk and return are perceived as negatively correlated and this perception has a significant

effect on judgment of risks. An image is associated with both of these attributes that can act as a stimuli to and gives birth to an affect. This affect helps one to make quick decisions. When information is presented only with respect to one of the stimuli the affect changes accordingly as the image is developed on the basis of the set of the two attributes rather than a single attribute (**Finucane et al, 2000**). Humans evaluate risks either using 'Analytical System' which involves use of scientific rules and formal logic for risk assessment or opposite to it they may depend upon 'experimental system'. While analytical system is slow, effortful and needs conscious control; experimental system is fast, automatic and involves unconscious part of the brain. Out of the two, experimental system is preferred in the events/decisions involving risks as it involves less effort. Decisions made under these conditions are regarded as irrational ones as decision maker is believed to exhibit Affect Heuristics wherein risk acts as a stimuli or affect. The success or failure of the decisions affected by affect heuristics largely depends upon the match between the results of the action and the way experience helps to anticipate it (**Slovic et al, 2004 &, Slovic et al, 2007**). It is also argued that affect heuristics paves the way for availability heuristics, as the information that comes to mind (availability) is the product of the stimuli, i.e. the images associated with the risks and benefits (**Finucane et al, 2000**).

Research Methodology

In the present study, the impact of Heuristics on the Rationality of the individual investors of Jammu and Kashmir is examined. For the present study a sample of 293 investors are taken from the state of Jammu and Kashmir. For determining the sample size, first the population frame was drawn from the total population of the individual investors of the state of Jammu and Kashmir. The population thus arrived at was 2300. It is pertinent to mention here that for the present study, only the investors who frequently buy and sell the stocks are considered while determining the population. The sample size was calculated using online calculator at 95% confidence level and 5% error margin and taking 2300 as the population size for this study. The sample size obtained was 330 respondents. The primary data is collected through a well-designed questionnaire and a Five point Likert Scale was used for this purpose wherein, '1' stands for 'Strongly Disagree', '2' for 'Disagree', '3' for 'Indifferent', '4' for 'Agree' and '5' for 'Strongly Agree'. This scale was primarily chosen due to its simplicity and suitability for the present study. The reliability of the questionnaire was tested through pilot testing. The pilot study was conducted on 80 investors with an idea of testing the reliability of the questionnaire designed and to have a better understanding of the respondents. The Exploratory Factor Analysis (EFA) was applied to categorize various questions/statements under different psychological traits, influencing the rationality of individual investors while they make investment decisions and also to have complete understanding of the questions which they feel difficult to understand. Reliability of the instrument was checked through Cronbach's Alpha. Reliability of an instrument refers to the degree of consistency between multiple measurements of variable. It deals with how consistently similar measures produce similar results (**Rosenthal and Rosnow, 1984**). The assessed Cronbach's Alpha found are given in table 1.

Table 1 Reliability measures for the study

| S. No. | Variables | Cronbach'sAlpha |
|--------|-------------|-----------------|
| 1 | Rationality | .804 |
| 3 | Heuristics | .848 |

Source: Primary data compiled by the scholar on the basis of field survey

It is argued that composite reliability estimate of 0.70 or higher indicates that the measurement scale that is used to measure a construct is moderately reliable (Nunnally, 1978). However, (Shelby 2011) argued that Cronbach's Alpha of over .6 is also acceptable. As is evident from table that the computed Cronbach's Alpha was recorded at .804 and .848 for Rationality andHeuristics, which is above the given threshold of 0.7 and 0.6. Further, in order to test the formulated hypotheses T-test and ANOVA were used. In addition to these tests correlation analysis was used to study the degree of relationship between these variables.

The following null hypotheses were formulated to study the influence of the demographic variables on the use of Heuristics:

- H₀1: There is no significant influence of Gender on the behavioral trait of Heuristics.
- H₀2: There is no significant influence of Age on the behavioral trait of Heuristics.
- H₀3: There is no significant influence of Educational Qualification on the behavioral trait of Heuristics.
- H₀4: There is no significant influence of Annual Income on the behavioral trait of Heuristics.
- H₀5: There is no significant influence of Investing Experience on the behavioral trait of Heuristics.
- H₀6: There is no significant influence of Occupation on the behavioral trait of Heuristics.
- H₀7: There is no significant influence of Religion on the behavioral trait of Heuristics.

Moreover to test the following hypothesis correlation analysis is carried out:

- H₀8: There is no significant relationship between Heuristics and Rationality.

Data analysis and Interpretation:

Assessing influence of Demographic Variables on the use of "Heuristics"

Table 2 depicts the results of t-test for variables to assess the influence of demographic variables on "Heuristics". The null hypothesis here is that the means are equal and the alternative hypothesis is that they are not equal. A big t, with small p-value, means that the null hypothesis is rejected, and we would ascertain that the means are significantly different; while a small t, with a big p-value indicates that they are not significantly different. Similarly, the null hypothesis here is that the group means are all equal and the alternative hypothesis is that they are not. A big f-value, with a small p-value means that the null hypothesis is rejected, and we would ascertain that the means are significantly different, while a small f with a big p-value indicates that they are not significantly different.

Gender: The t-value obtained is 0.92 and it is significant at 1% level. The value indicates that there is significant difference among the investors on the basis of gender in terms of heuristics. Therefore, null hypothesis H_{01} , i.e., “there is no significant difference on the basis of Gender in terms of Heuristics” is rejected. Further, the mean value obtained for male investors is higher compared to females, indicating males are more exposed to heuristics bias compared to females and as such males deviate more in terms of rationality compared to females, in terms of Heuristics.

Age: The f-value obtained in this case is 1.57 and it is not statistically significant. The value indicates that there is no significant difference among the investors on the basis of age in terms of heuristics. Therefore, null hypothesis H_{02} , i.e. “no significant difference on the basis of Age in terms of Heuristics” is accepted.

Table: 2- Influence of Investors’ Demographics on Heuristics

| Variables | Categories | N | Mean | S.D. | t/f Values |
|----------------------|------------------------------------|-----|------|------|-----------------------------|
| Gender | Male | 253 | 3.33 | 0.44 | t=0.92* (p=.006) |
| | Female | 50 | 3.27 | 0.55 | |
| Age | Less than 30 | 61 | 3.26 | 0.50 | f=1.57 (p=.197) |
| | 30-40 | 130 | 3.38 | 0.47 | |
| | 40-50 | 76 | 3.33 | 0.44 | |
| | More than 50 | 36 | 3.23 | 0.37 | |
| Education | Secondary | 27 | 3.27 | 0.53 | f=2.65** (p=.033) |
| | Undergraduate | 69 | 3.35 | 0.41 | |
| | Graduate | 107 | 3.39 | 0.46 | |
| | Post-graduate | 80 | 3.30 | 0.49 | |
| Annual Income | Doctorate | 20 | 3.04 | 0.35 | f=5.48* (p=.001) |
| | Up to 3,00,000 | 116 | 3.42 | 0.51 | |
| | 3,00,001-5,00,000 | 92 | 3.31 | 0.40 | |
| | 5,00,001-7,00,000 | 62 | 3.14 | 0.42 | |
| Investing Experience | Above 7,00,001 | 33 | 3.38 | 0.45 | f=10.20* (p=.000) |
| | 0-3 years | 115 | 3.35 | 0.48 | |
| | 3-5 years | 74 | 3.15 | 0.42 | |
| | 5-10 years | 79 | 3.30 | 0.46 | |
| Occupation | More than 10 years | 35 | 3.65 | 0.30 | f=5.46* (p=.000) |
| | Self-Employed | 123 | 3.33 | 0.44 | |
| | Govt. Employees (Retired & Active) | 64 | 3.47 | 0.41 | |
| | Private Employee | 53 | 3.16 | 0.46 | |
| Religion | Professors | 18 | 3.05 | 0.53 | t=1.84 (p=.643) |
| | Others | 45 | 3.40 | 0.46 | |
| | Islam | 267 | 3.34 | 0.45 | |
| | Others | 36 | 3.19 | 0.51 | |

Source: Primary data compiled by the scholar on the basis of field survey
***values significant at 1%;**values significant at 5%**

Education: For educational qualification, the f-value obtained is 2.65, which is significant at 5% level. The value shows that there is significant difference among the investors in terms of the use of heuristics for financial decision-making, on the basis of educational qualifications they possess. Hence, the formulated hypothesis H_{03} , i.e. “there is no significant difference on the basis of Educational Qualification in terms of Heuristics” is rejected. In addition, the mean value reveals that the investors

who are post-graduate and graduate exhibit more heuristics in their trades, and the investors having doctorate qualification exhibit least such type of behavior.

Annual Income: The obtained f-value is 5.48, and it is statistically significant. The value indicates that there is significant difference among the investors on the basis of annual income, when tested with respect to Heuristics. Therefore, formulated null hypothesis H_04 that “there is no significant difference on the basis of Annual Income in terms of the behavioural factor of Heuristics” is rejected. Furthermore, the Table 2 shows that the investors having annual income upto Rs 3,00,000 p.a. have witnessed highest mean score of 3.42 and the lowest mean score of 3.14 is witnessed for investors having income of Rs 5,00,001 to Rs 7,00,000 p.a. This indicates that investors having lowest income show greater use of heuristics in financial decision-making.

Investing Experience: The obtained f-value is 10.20 and it is significant at 1% level of significance. The value indicates that the investors show significant difference on the basis of their investing experience in terms of the presence of heuristics in their financial decisions. Therefore, formulated hypothesis H_05 that “there is no significant difference on the basis of Investing Experience in terms of Heuristics” is rejected. Further, investors having more than 10 years of investing experience are more prone to the use of heuristics as they have recorded highest mean score of 3.65.

Occupation: The f-value of 5.46, which is significant at 1% level of significance reveal that depending upon the type of occupation, investors differ significantly with respect to the use of heuristics in financial decision making, resulting in the rejection of null hypothesis H_06 , and i.e. “there is no significant difference on the basis of Occupation in terms of Heuristics”. The highest mean value is witnessed among govt. employees and lowest mean score is recorded for professors (academicians). This reveals that the investors who are govt. employees are more prone to the use of heuristics compared to other categories.

Religion: The t-value value obtained for demographic variable of religion is 1.84 and it is not statistically significant. This confirms that religion has no role to play in determining heuristics among the investors. Hence null hypothesis H_07 , that “there is no significant difference on the basis of Religion in terms of Heuristics” is accepted.

Correlation Analysis

The aim of this analysis is to determine whether there exists any relationship between the variables under study. Moreover it provides what kind of relation, if any, exists between the variables. The values of correlation may range between -1 to +1, depending upon the type of relationship between the variables under study. In order to determine the influence of heuristics on investors' rationality, bi-variate correlation analysis is used. These results are significant at 0.01 level and 2-tailed test is carried out.

The results obtained in the Table 3 shows heuristics has a positive correlation with the rationality ($r=0.172$). This signifies that heuristics plays a positive role in influencing the rationality in financial decision making and hence can help to improve financial decisions in terms of rationality but not too much as the correlation measure is weak. Therefore, null hypothesis H_08 saying “there is no

significant relationship between Heuristics and Rationality” is rejected. It can thus be concluded that the use of heuristics can enhance rationality in investment decision by 17.2%.

Table 3: Relationship between Heuristics and Rationality of the individual investors

| | |
|-------------------------|------------------------|
| Rationality (F3) | Heuristics |
| | .172* P-value= .003 |

Source: Primary data compiled by the scholar
*values significant at 1% (2-tailed)

Conclusion

While people may vary in terms of the presence of psychological factors in their decision-making on the basis of various demographic variables, their presence can’t be ignored. In the present study, heuristics show different impact on the individual investors’ when they are evaluated on the basis of age, annual income and occupation. The study reveals that the influence of heuristics cannot be ruled out altogether. Various psychological traits may differ in terms of their impact, but surely significant influence on the rationality of the financial decisions made by the investors. It is also evident from the analysis that males are more exposed to heuristics bias compared to females and as such males deviate more in terms of rationality compared to females, in terms of Heuristics. The investors who are post-graduate and graduate exhibit more heuristics in their trades, and the investors having doctorate qualification exhibit least such type of behavior. Similarly, the investors having lowest income show greater use of heuristics in financial decision-making. Lastly, heuristics are positively correlated with Rationality, although the degree of correlation is low. In other words, in certain cases heuristics can improve the rationality of investors.

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