

## Information searches as a mediator between Income and risky decision-making behavior and influence of education on risky decision-making behavior: a study from Pakistan

Hifza Mahmood Rana, Junaid Khan and Adeela Asif Baig

Department of Management Sciences, Iqra University,  
Islamabad, Pakistan

### Keywords

Advice-seeking information, digital information, heuristics, income, education, risky decision-making

### Abstract

*The purpose of this study is to investigate the mediating role of information searches between income and risky decision-making and to investigate the influence of education on risky decision-making behavior of investor. Hypotheses were developed from the literature and these hypotheses statement were tested through the use of questionnaire. The items of questionnaires were adapted from previous relevant studies and then distributed to the individual investors of busiest Stock Exchange markets of Pakistan including Islamabad, Karachi and Lahore. 303 questionnaires were finally analyzed as the response rate was 76.71%.*

*Income was found to have a significant and positive relationship with advice-seeking and digital information search. However, there was no significant relationship between income and heuristics. Advice-seeking information search, digital information search, heuristics and education were found to have positive and significant effect on risky decision-making behavior. This study contributes in the field in order to increase the confidence of individual investors to prefer risky investments by providing them guidance that how to control the constraint factors to achieve higher returns and by discussing, the worth of information searches and education level will increase their preferences for risky investments. This study did not investigate the effect of education level on information searches. Further research might include education as a variable to analyze its influence on information search behavior.*

### Introduction

Prospect theory has provided with a detail framework that relates to the ways of individuals who make decisions under the cover of risk and uncertainty. They undertake two steps to formulate a decision: editing and assessment. The first step involves the managing, simplifying and reformulating of the forecasts. The second step assessment involves the identification of the projection that is with the highest value of placing a value on every forecast (Baker and Nofsinger, 2002). The critical notion for any financial investment is the notion of risk in decision-making. These risky decisions are influenced by a variety of factors. If high uncertainty is involved in the decision in terms of options amid alternatives then the decision is risky and the acceptance of risky investment is termed as risky decision-making behavior (Sitkin and Pablo, 1992). In order to reduce the risk, investor usually tend to create risk reducing strategies (Tseng and Yang, 2011; Lee and Cho, 2005; Howcroft et al., 2003) and then make final decision. Investor acquires information in order to make risk reducing strategies before taking final decision and the information comes from advice-seeking and digital information searches. Information acquisition is the most important stage of decision-making and the primary advantage of information searches is that it helps to reduce the risk (Bennett and Harrel, 1975). As the decision-making environment become so complicated that individuals mostly relying on

taking advices from experts or some other sources. Individuals sometimes rely on their own sources to arrange and assimilate information (Barrett et al., 1999) and they heavily rely on advice-seeking information (Waldfogel, Joel and Cheng, 2003; Caillaud et al., 2001). As the information technology advances with the rapid pace and people get used to of it in their every task like internet search engines are the best source to get information (Baker and Nofsinger, 2002; Barber and Odean, 2000b). Investors either they are big or small they are making rapid decisions depending upon the instant information, which is available on financial websites (Smith and Harvey, 2011). Information about financial statements and financial growth of particular company is significant for investors and they can easily get this relevant information by just one click (Loibl and Hira, 2009; Baker and Nofsinger, 2002; Lin, 2002).

Investor's aim is not just to reduce the associated risk but also to reduce the effort which is also associated with decision-making process (Tseng and Yang, 2011; Simon, 1990). The best way to reduce the effort is to use the heuristics in making decisions as these are the rule of thumbs (Lovric, 2011; Tversky and Kahneman, 1973). Mostly investors are not willing to adopt the long computational strategies to calculate the estimated risk and return as these strategies require long hours and high energy as well. Therefore, investors are more likely to use heuristics in decision-making (Shah and Oppenheimer, 2008). Investors are more likely to buy the stocks with their enviable qualities like they believe that good companies generates high sales and high earnings (Shefrin, 2000; Baker and Nofsinger, 2002) but individuals who instinctively take up such prophecies are likely to disregard the contemplations of inevitability (Tversky and Kahneman, 1974).

The demographic factors also affect the information searches behavior of investors (Lovric, 2011). Income and education are the most significant factors which affect decision-making behavior of investor (Peress, 2004; Donkers et al., 2001). It has been evident that when investors seek the financial advice their decision to invest in stocks is positively associated with the dealings of wealth and income with their risk attitude and with financial expert advices (Shum and Faig, 2006). Irrespective of the fact that the internet makes easy for individuals to get informed about everything there is still a momentous gap between the investments in equity and average individuals of U.S (Shum and Faig, 2006). The reason is the lack of information and the costs of the transaction. The cost of acquiring information whether it is through brokerage houses or through internet requires investor to be rich enough in order to accept the risky investment (Tseng and Yang, 2011; Shum and Faig, 2006). Reliance on heuristics is also the one form of information acquisition source and investors with high level of income are more capable to bear loss so they tend to rely on heuristics more than investors with low level of income (Griffin et al., 2002; Tseng and Yang, 2011). Investors with low level of income cannot afford loss so they heavily rely on long calculations of risk and return estimations (Tseng and Yang, 2011). The other demographic factor is education which has an influence on risky decision-making of investor. People with higher education, are observed as showing higher acceptance for risk while less educational person are been more risk averse (Cagney et al., 2002; Grable and Lytton, 1999; Quadrel et al., 1993; Fischhoff et al., 1977).

Our study aims to investigate the demographic factor's role including income and education in risky decision-making behavior of investors. Prior studies have been conducted to analyze the role of information search behavior of investor, however only few studies investigated the mediating part of information search behavior between income and risky

decision-making behavior. It endeavors to fill this gap by exploring the direct affect of education and mediating affect information searches on risky decision-making in terms of income. The purpose of this research study is to answer the following questions; first, how risky decision-making is affected by education? Second, does income affect the information search behavior? And third, how does information search behavior influence the risky decision-making behavior of investor?

## **2. Literature Review**

### **2.1 Information Search Behavior**

Information intermediary may refer to an economic representative who supports the making and utilizing of information so that the value of that particular information is enhanced for its end consumer or to help the consumer to reduce the cost which may incur on acquiring the information (Lee and Cho, 2005). In various behavioral areas, the value of an individual's willingness has taken a supportive part starting from buying intentions of the customers to the commitment of relationships (Sirdeshmukh et al., 2002; Woodruff, 1997). However, the chances of using information from advisors by investors may determined by the perceived benefits of investors by getting informed by the advisors (Lee and Cho, 2005). Particularly individuals having their brokerage accounts with complete services might acquire information only by soliciting advice from their brokers and other relies on brochures, magazines and advices from friends or family members (Peress, 2004; Certo et al., 2003; Lin, 2002; Rao et al., 2001; Yale and Gilly, 1995; Price and Feick, 1983; Murray, 1991; Kiel and Layton, 1981). The worth of taking information from both sources may differ in terms that expert advisor gives you the latest information while information from friends or family may be outdated (Lin, 2002).

Internet has changed the means people make their decisions about investments (Barber and Odean, 2000b; Baker and Nofsinger, 2002). Getting information from the source of the internet is becoming more vital because of its divergent advantages. The investor need not to consult frequently any other source except internet (Lin, 2002). By getting the financial dimensions of the firm (Baker and Haslem, 1974; Murphy and Soutar, 2004; Nagy and Obenberger, 1994), investor may turn out to be more capable to examine the position of that firm in terms of stocks and returns on those stocks and financial dimensions may termed as digital information (Tseng and Yang, 2011) search behavior in this study. In 1970s Tversky and Kahneman examined the heuristics on which people often rely when they are making decisions which involves risk in it. With the emergence of behavioral finance, heuristics become helpful in a way that it makes the complex task easier in terms of assessment of likelihood of vague outcomes (Shanteau, 1989). As the cognitive resources become limited for individuals, they tend to prefer those strategies, which decrease their hard work to calculate tough algorithms. Therefore, heuristics are those strategies or principles of effort-reduction or generalization (Shah and Oppenheimer, 2008). Investors are more likely to buy the stocks with their enviable qualities like they believe that good companies generate high sales and high earnings (Shefrin, 2000; Baker and Nofsinger, 2002).

### **2.2 Income**

The portfolios of financial assets are one source to generate annual asset income for investors. Individuals generating a large portion of income considered as rich and those who are generating low considered as poor. In terms of finance, poor investors do not have the potential to buy enough stocks but once households become rich, they start buying more stocks to catch

the position in the financial market (Jorgensen, 1999). Whether the investor is rich or poor, he may need knowledge about the riskiness of stocks and for the acquisition of knowledge they rely on different information sources including advises from experts (Cho and Lee, 2004; Shum and Faig, 2006), family or friends (Kuhlthau, 1999), brochures, magazines (Schmidt and Spreng, 1996; Moore and Lehmann, 1980), through internet (Waldfogel, Joel and Cheng, 2003); aillaud et al., 2001) or by using heuristics (Shah and Oppenheimer, 2008; Hedesstrom et al, 2007). All kind of information searches requires some kind of cost to spend in this searching information (Shum and Faig, 2006; Tseng and Yang, 2011) and this is the reason that rich investors are more willing and also capable to invest in acquiring information from financial advisors and accounting information via internet (Tseng and Yang, 2011; Ohlson, 1975; Lavalley, 1968). Individuals perceive more about the worth of information in the only case when they recognize that payback is more than the incurred cost and it depends upon the characteristics of individuals (Zeithaml, 1988). Perceiving the payback is positively correlated with the income of the individual (Lee and Cho, 2005; Feick et al., 1986). Rich investors make risky investments more frequently than poor investors (Vissing-Jorgensen, 2004). He has also explained that wealthier investors tend to be more overconfident about their investments. However, the purpose of this study is to investigate the affect of income on risky decision-making behavior in the presence of mediating role of information search behavior.

### 2.3 Education

Education is one of the most important factors that play a vital role in enhancing a person's personality. As people move on to higher level of education, their exposure becomes vast and their experience, skills, knowledge get enriched (Haliassos and Bertaut, 1995; Baker and Haslem, 1974). Higher education level not only help individual in taking decision at personal level, but its performance increases manifold when its implications are studied at professional level. Investors with higher level of education show different decision making their counterparts with lower level of education (Rana et al., 2011; Riley and Victor, 1992). Research shows that investors with higher education level exhibits more risk tolerance (Baker and Haslem, 1974). It is proved through literary evidences that decision makers with higher level of education go for more risky decisions while decision makers whose education level is low usually exhibit more risk averse attitude (Veld, 2003; Grable, 2000). An interesting logic is discussed for the positive relationship between education and risk acceptance, that people who get higher studies usually have more money so they can afford to take challenges and can professionally evaluate level of risk associated with particular project and all this activity enhance overall risk acceptance of a decision maker (Cheng and Tsai, 2011). There are some studies which did not find any relationship between education and risky decision-making (Bajtelmsmit et al., 1999; Sunden and Surette, 1998). However, many studies have found positive correlation between education and risky decision-making (Rana et al., 2011; Haliassos and Bertaut, 1995; Baker and Haslem, 1974) as this study endeavors to find out the relationship between these two variables.

### Research Hypotheses and Research Model

Information searches refer to the development of strategies which reduces risk and these information search behavior is influenced by income of investor (Tseng and Yang, 2011; Ohlson, 1975; Lavalley, 1968). The worth or value of the information may vary among individuals with the variations in their income because it depends upon the limits and form of the utility function of individuals (Lavalley, 1968). This value of information searches may increase with the increase in income if these limits are being restricted (Ohlson, 1975). An investor whose seeks out cost is

higher may connect in smaller advice-seeking search than those whose seek out costs are inferior (Tseng and Yang, 2011; Ohlson, 1975; Lavalle, 1968).

H<sub>1</sub>: *Advice-seeking information search increases with the increase in income of investor.*

Investor with high-income level may desire to acquire up to date information via internet about the firm in order to hold more stocks or mutual funds so that he/she may achieve higher returns, and higher Sharpe ratio of their portfolios (Peress, 2004; Donkers and Van Soest, 1999; Quadrini and Rios-Rull, 1997; ).

H<sub>2</sub>: *Digital information search increases with the increase in income of investor.*

Investor's intention to invest more in risky assets increases their demand to acquire more information and the use of heuristics helps them to create risk-reducing strategies as it depends on their income level (Griffin et al., 2002; Shah and Oppenheimer, 2008; Lovric, 2011).

H<sub>3</sub>: *The reliance on heuristics increases with the increase in income of investor.*

Risky-decision making behavior refers to the preferences of the investors for risk (Sitkin and Weingart, 1995) and these risky decisions are influenced by a variety of factors and one of them that are significant is the information search behavior. Investor tends to prefer more risky assets with the enhanced advice-seeking information (Certo et al., 2003; Lin, 2002), digital information search (Lee and Cho, 2005; Peress, 2004) and reliance on heuristics (Tseng and Yang, 2011; Shah and Oppenheimer, 2008).

H<sub>4</sub>: *Risky decision-making behavior increases with the increase in advice-seeking information search.*

H<sub>5</sub>: *Risky decision-making behavior increases with the increase in digital information search.*

H<sub>6</sub>: *Risky decision-making behavior increases with the increase in use of heuristics.*

Level of formal education is proved to increase risk tolerance of people particularly managers. Decision makers with higher college or university education, are observed to have higher preference for risky projects (Cheng and Tsai, 2011; Grable, 2000; Haliassos and Bertaut, 1995; Baker and Haslem, 1974).

H<sub>7</sub>: *Risky decision-making increases with the increase in education level of investor.*

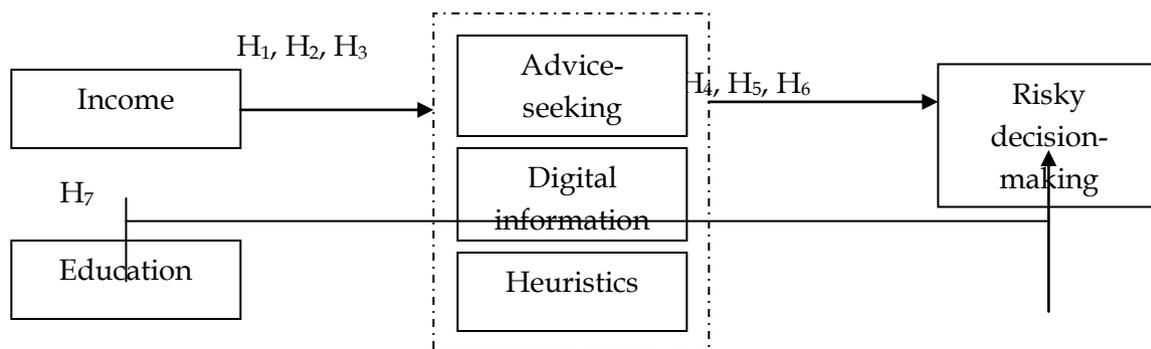


Figure 1: Research Model of Risky Decision-making Behavior

## 4. Research Methodology

### 4.1 Instrument Development

In order to measure the information search behavior regarding risky decision-making behavior in terms of demographics the psychometric scale was developed from the literature. There are two sections in the questionnaire; first section included the general information as well as demographic information of the respondents (i.e. age, gender, education, experience and income level). Second section included the questions regarding variables of this study as follows. Five items included to measure risky decision-making behavior adapted from Lee and Cho (2005), Fisher and Statman (1997) and Warren et al. (1990). To assess the affect of heuristics

mainly representative heuristics, three items adapted from Baker and Nofsinger (2002) and Shefrin (2000). Three items to investigate extent of digital information search by investor adapted from Lee and Cho (2005) and Nagy and Obenberger (1994). Advice-seeking information search behavior was measured through the adaption of three items from Lee and Cho (2005) and Nagy and Obenberger (1994). All items are assessed on five point Likert scale where 5 represents strongly agree and 1 represents strongly disagree. Ranking of income level was taken from Tseng and Yang (2011) which ranges from below Rs. 1425000 to above Rs. 4750000 annually. Respondents were given four options for education level starting from under graduate to above masters.

#### 4.2 Data Collection and Respondents Profile

Data was collected from individual investors by using a questionnaire. Individual investors of three cities of Pakistan were selected including Islamabad, Karachi and Lahore as the Stock Exchange of these cities are the busiest in country and made easy to achieve acceptable response rate i.e. 76.71 percent. All the respondents were experienced in dealing in stocks, futures and mutual funds. 313 questionnaires were obtained successfully out of 395 which were initially distributed. All the questionnaires were personally administered through face-to-face interaction with investors. 10 questionnaires were invalid because of the inexperience of investors and those were discarded. Among respondents only 2% were females and 98 were males; 21% were above the age of 55; 29% were having below Rs. 1425000 income; 18% were qualified as graduates; 47.2% were as masters and 34.6% were above masters.

#### 4.3 Data Analyses

Data was firstly analyzed through exploratory factor analysis which was conducted for 51 questionnaires. The purpose of EFA was to finalize the items of questionnaires to investigate the relationship between the variables of this study (Cudeck and O'Dell, 1994). Five distinct factors were determined which were with the greater than 1 eigen value as mentioned in table 1 below. The total variance for these distinct factors was 85.98%. KMO measured the sampling adequacy and it was about 0.834 and minimum suggested is 0.6. Reliability analysis of items was also conducted for these 51 questionnaires through the scale's internal uniformity. Each item indicated the Cronbach Alpha more than 0.7 a suggested minimum (Hair et al., 1998) as follows; risky decision-making behavior 0.865, advice-seeking information search 0.786, digital information search 0.805 and heuristics 0.698.

Items	Factor Loadings	Items	Factor Loadings
Risky decision-Making behavior		Advice-seeking information	
RDM1	0.934	ADV1	0.886
RDM2	0.724	ADV2	0.931
RDM3	0.963	ADV3	0.808
RDM4	0.842	Digital information	
RDM5	0.726	DIG1	0.765
Heuristics		DIG2	0.879
HEU1	0.892	DIG3	0.823
HEU2	0.900		
HEU3	0.913		

Table 1: Results of EFA

The items were finalized after conducting EFA and reliability analysis and no item was dropped at this stage. After collecting all the questionnaires Confirmatory factor analysis (CFA) was conducted for 303 questionnaires. The purpose of CFA was to analyze whether the data fit with hypothesized structural model (Asparouhov and Muthen, 2009). No item was sharing high degree of residual variance with any other item therefore no item was extracted. The absolute fit indices (Gefen et al., 2000) were as follows; GFI=0.931, CFI=0.970, NFI=0.932, AGFI=0.903, RMSEA=0.049 and RMR=0.058.

## 5.Results

Regression Analysis was used to analyze the relationship between dependent and independent variables, to check either there is any impact positive or negative; independent variables have on dependent variable. Linear regression model is particularly handful in checking the influence; one or more independent variables have on dependant variable so this particular model is part of my data analysis. Firstly the income effect was analyzed on information search behavior along with the effect of education on risky decision-making behavior. Secondly, the effect of information behavior was analyzed on risky decision-making behavior. Table 2 indicates the results of the regression analysis. It indicates the values for R-square which is the squared correlation between the values of the single regressor and the outcomes that are being used for estimation. R-square must be ranges from 0 to 1 as if coefficient of determination ( $R^2$ ) is 1 it shows that regression line fits the data perfectly (Colin et al., 1997).

	$R^2$	t	$\beta$	p-value
Income → Advice-seeking information	0.551	19.221	0.742	0.000
Income → Digital information	0.758	30.680	0.870	0.000
Income → Heuristics	0.011	1.863	0.107	0.063
Advice-seeking information → Risky decision-making	0.076	4.983	0.276	0.000
Digital information → Risky decision-making	0.059	4.327	0.242	0.000
Heuristics → Risky decision-making	0.032	3.139	0.178	0.002
Education → Risky decision-making	0.894	5.982	0.327	0.000

Table 2: Results of Regression Analysis

In case of relationship between income and advice-seeking information search the value for  $R^2$  is 0.551 which is closer to 1. It indicates that regression line strongly fits the data and  $\beta$  value represents the positive relationship between both variables. Finally, the p-value indicates that income positively and significantly has an effect on advice-seeking information ( $\beta=0.742$ ,  $p<0.05$ ), supporting  $H_1$ . The values for  $R^2$  for each variables ranges between 0 and 1, therefore all are acceptable. Income is positively and significantly found to have an effect on digital information search as one increase, the other will also ( $\beta=0.870$ ,  $p<0.05$ ), supporting  $H_2$ . However, this is not the case when looked at the p-value for income and heuristics. The beta value shows that there is a positive relationship between income and heuristics, however the relationship was found to be insignificant ( $\beta=0.107$ ,  $p>0.05$ ), rejecting  $H_3$ . The effect of information search behavior was found to be significant and positive on risky decision-making behavior ( $\beta=0.276$ ,  $p<0.05$ ;  $\beta=0.242$ ,  $p<0.05$ ;  $\beta=0.178$ ,  $p<0.05$ ), accepting  $H_4$ ,  $H_5$  and  $H_6$ . Education was also found to have positive and significant effect on risky decision-making behavior ( $\beta=0.327$ ,  $p<0.05$ ), supporting  $H_7$ .

## 6.Discussion

This study has found the answers of following three questions first, how risky decision-making is affected by education? Second, does income affect the information search behavior?

And third, how does information search behavior influence the risky decision-making behavior of investor? These research questions are addressed all along this research by considering the risk acceptance in investment as risky decision-making behavior of investor (Sitkin and Pablo, 1992). Another dimension assessed the relationship of income and risky decision-making behavior with information searches. Our proposed model is successfully confirmed. Our study contributes in understanding the role of income in information search behavior. The results suggested that rich investors are more concerned to get the information from financial experts as compared to the poor investors and more they get advices, more they invest in risky assets. Hilton (1980) categorizes three types of cost which are associated with the advice-seeking information search i) purchasing price, ii) locality price and iii) cost of information processing. As a result when the worth of this costly information enhances with the increase in income then the decision of the individual to acquire information heavily depends upon his income (Peress, 2004; Kahn and Baron, 1995). Dhar and Zhu (2006) proposed various demographics, which are correlated with the better information search and knowledge of investments in stocks, which have a lesser disposition bias. They examined the effect of income and found that investors with high income expose less to the disposition bias. This is due to the reason that wealthy investors tend to have access towards the financial advisor to get proper advice because they are capable to afford the services, which are value-added.

Results suggested that rich investors are more probable to use digital information search. Internet is the source of information, however investor need to identify their relevant source of information among the variety of available sources (Lee and Cho, 2005). Rich investors prefer more to acquire information regarding estimated dividends, financial strength, and future prospects in order to make risky investments as compared to poor investors and the desire for stocks becomes the u-shaped function of income (Peress, 2004; Donkers and Van Soest, 1999; Lewellen, Lease and Schlarbaum, 1977).

Our study found no significant relationship between income and reliance on heuristics. It was assumed that as the income of investor increases, the reliance on heuristics also increases as the investor usually perceives company to be good if its past performance is strong (Lovric, 2011; Tseng and Yang, 2011). Heuristics were supposed to be one of the risks reducing strategy (Shah and Oppenheimer, 2008) through which rich investors get help in order to invest in risky assets. However, the study revealed that Pakistani rich investors are reluctant to rely on heuristics while making risk reducing strategies. One of the reasons could be that too much reliance on heuristics may lead to biases (Griffin et al., 2002) and as heavy amounts of rich investors are on stake so they probably prefer to use long calculations rather than heuristics to find out the estimations.

Results indicated the positive and significant relationship between information search behavior and risky decision-making. On other side, same results were found for education and risky decision-making behavior. As the advice-seeking, digital information searches and reliance on heuristics increases, the investment in risky assets tend to increase (Tseng and Yang, 2011; Shah and Oppenheimer; Lee and Cho, 2005; Peress, 2004; Certo et al., 2003; Shanteau, 1989). Results showed that risk acceptance of investors' increases with increase in education level. Investors with highest level of education i.e. above master's level possess highest risk acceptance while investors whom qualification is graduate exhibits risk averse attitude. These results are

similar to the previous studies as education enhances critical judgment of a person manifold and allows them to think vast (Rana et al., 2011; Haliassos and Bertaut, 1995; Riley and Victor, 1992).

## 7. Conclusion and Limitations

The current financial crisis of the world also affects the investments of the individual investors, particularly in this study, investors of Pakistan. In this situation, the investor gets worried about their investment. Although they are investing in different financial products but they are not sure about to earn their desired returns. They are more concerned to create the risk reducing strategies and they tend to seek relevant information which enables them to create those strategies. For this purpose, this study contributes in a more valuable way to make investors aware about the consequences of their demographic roles and behaviors regarding risky investments. The information search behavior of an investor influence the decisions made by investors especially when there is an uncertainty in investments. The demographic factors including income and education level of investor also have an impact on the decision-making behavior of investor. Research hypotheses have developed after detail review of literature and then research model have been developed. Results have indicated the positive and significant effect of advice-seeking information search, digital information search, reliance on heuristics and education on risky decision-making behavior. As the information search behavior and education level increases, the investment in risky assets tend to be increased. The effect of income level on information search behavior also investigated. Other than reliance on heuristics, income positively and significantly has an effect on both information search behaviors. The reason could be that the more reliance on heuristics may lead investors to psychological biases, which causes serious harm to their investments. Currently Pakistan is facing a problem of inflation, which creates hurdles for the investors. Due to the inflation, investors have low savings that need to be investing in stocks or mutual funds. With their low level of income, their attitude is changing towards risk. The current study will increase the confidence of individual investors to prefer risky investments by providing them guidance that how to control the constraint factors to achieve higher returns? By discussing, the usefulness of information searches with respect to investor's income will increase their preferences for risky investments.

There is a positive significant effect of demographic factor i.e. income on information search behaviors. However, this study did not investigate the effect of education level on information searches. Further research might include education as a variable to analyze its influence on information search behavior.

## References

- Asparouhov, T. and Muthén, B. (2009). "Exploratory structural equation modeling", *Structural Equation Modeling*, 16, 397-438
- Bajtelsmit, Bernasek and Jianakoplos. (1999). "Gender differences in defined contribution pension decisions", *Financial Services Review*, 8 (1), 1-10.
- Baker and Haslem. (1974). "Toward the development of client-specified valuation models", *Journal of Finance* 29 (4), 1255-1263
- Baker, H., and Nofsinger, J. (2002), "Psychological biases of investors", *Financial Services Review*, 11 (2), 97-116.
- Barber, B., and Odean, T. (2001b). "The internet and the investor", *Journal of Economic Perspectives*, 15(1), 41-54.

- Barrett, Rob., and Paul, P. Maglio. (1999). "Intermediaries: An Approach to Manipulating Information Streams", *IBM Systems Journal*, 38 (4), 629-641
- Bennett, P., and Harrell, G. (1975). "The role of confidence in understanding and predicting buyers attitudes and purchase intentions", *Journal of Consumer Research*, 2(2), 110-117.
- Cagney and Lauderdale. (2002). "Education, wealth, and cognitive function in later life", *Journal of Gerontology: Psychological Sciences*, 57b (2), 163-172.
- Caillaud, B., and Bruno, J. (2001). "Software and the Internet: Competing Cybermediaries", *European Economic Review*, 45 (4-6), 797-808.
- Certo, S. T. (2003). "Influencing IPO investors with prestige: Signaling with board structures", *Academy of Management Review*, 28, 432-446.
- Certo, S. T., Daily, C. M., Cannella, A. A., and Dalton, D. R. (2003). "Giving money to get money: How CEO stock options and CEO equity enhance IPO valuations", *Academy of Management Journal*, 46, 643-644.
- Cheng and Tsai. (2011). "Understanding online group buying intention: the role of sense of virtual community and technology acceptance factors", *Total Quality Management and Business Excellence*, 22 (10), 1091-1104.
- Cho., and Lee. (2004). "Risk and Risk Reducing Strategies", Working paper, University of Wisconsin-Madison.
- Colin Cameron, A.; Windmeijer, Frank A.G.; Gramajo, H; Cane, DE; Khosla, C (1997). "An R-squared measure of goodness of fit for some common nonlinear regression models", *Journal of Econometrics* 77 (2): 1790-2
- Cudeck, R., and O'Dell, L. L. (1994). "Applications of standard error estimates in unrestricted factor analysis: Significance tests for factor loadings and correlations", *Psychological Bulletin*, 115, 475-487
- Dhar, R., and Zhu, N. (2006). "Up close and personal: Investor sophistication and the disposition effect", *Management Science*, 52 (5).
- Donkers, B., and A. Van Soest. (1999). "Subjective Measures of Household Preferences and Financial Decisions", *Journal of Economic Psychology*, 20, 613-642.
- Donkers, B., Melenberg, B., and Soest. (2001). "Estimating risk attitudes using lotteries: A large sample approach", *Journal of Risk and Uncertainty*, 22(2), 165-195, 2001.
- Feick, Lawrence F., Robert O. Herrmann., and Rex H. Warland. (1986). "Search for Nutrition Information: A Probit Analysis of the Use of Different Information Sources", *Journal of Consumer Affairs*, 20 (2), 173-193.
- Fischhoff, B., Slovic, P., Lichtenstein, S. (1977). "Knowing with certainty: the appropriateness of extreme confidence", *J. Exp. Psychol. Hum. Percept. Perform.* 3, 552-64
- Fisher, K., and Statman, M. (1997). "Investment advice from mutual fund companies", *The Journal of Portfolio Management*, 24(1), 9-25.
- Gefen, David., Straub, D., and Boudreau, M. (2000). "Structural equation modeling and regression: Guidelines for research practice", *Communication of AIS*, 4 (7).
- Gilovich, Thomas; Griffin, Dale W. (2002). "Introduction - Heuristics and Biases: Then and Now", in Gilovich, Thomas; Griffin, Dale W.; Kahneman, Daniel, *Heuristics and biases: the psychology of intuitive judgement*, Cambridge University Press, 1-18
- Grable, J. E. and Lytton, R. H. (1999). "Financial risk tolerance revisited: The development of a risk assessment instrument", *Financial Services Review*, 8, 163-181.
- Grable. (2000). "Financial risk tolerance and additional factors that affect risk taking in everyday money matters", *Journal of Business and Psychology*, 14 (4), 625-630.

- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. (1998). "Multivariate Data Analysis", fifth edition, Prentice-Hall International, Inc.
- Hair, J., Anderson, R., and Tatham, S. (1987). "Multivariate Data Analysis", Macmillan: New York, NY.
- Haliassos and Bertaut. (1995). "Why do so few hold stocks?", *The Economic Journal*, 105, 1110-1129.
- Harvey C., and Smith (2011). "Learning Simply Accounting by Sage Premium 2010: A Modular Approach", Toronto: Nelson Education.
- Hedesstrom TM, Svedsater H, Garling T (2007). "Determinants of the use of heuristic choice rules in the Swedish premium pension scheme: an Internet-based survey", *J. Econ. Psychol.*, 28(1): 113-126.
- Hilton, R.W. (1980). "Integrating normative and description theories of information processing", *Journal of Accounting research*, 477-505.
- Howcroft, B., Hewer, P., and Hamilton, R. (2003). "Consumer decision-making styles and the purchase of financial services", *The Service Industries Journal*, 23(3), 63-81.
- Kahn, B. E., and Baron, J. (1995). "An exploratory study of choice rules favored for high-stakes decisions", *Journal of Consumer Psychology*, 4(4), 305-328.
- Kiel, G. C., and Layton, R. A. (1981). "Dimensions of consumer information seeking behavior", *Journal of Marketing Research*, 18, 233-239.
- Kuhlthau, C. (1999). "The role of experience in the information search process of an early career information worker: Perceptions of uncertainty, complexity, construction, and sources", *Journal of the American Society for Information Science*, 50(5), 399-412.
- Kuhlthau, C.C. (2004). "Seeking Meaning: A Process Approach to Library and Information Services (2nd Ed.)", Westport: Libraries Unlimited Inc.
- Lavalle, I.H. (1968). "On cash equivalents and information evaluations in decision under uncertainty: Part I, II and III", *Journal of American Statistical Association*, 252-90.
- Lee, J., and Cho, J. (2005). "Consumers' use of information intermediaries and the impact on their information search behavior in the financial market", *Journal of Consumer Affairs* 39 (1), 95-120
- Lewellen, W., Lease, R., and Schlarbaum, G. (1977). "Patterns of investment strategy and behavior among individual investors", *The Journal of Business*, 50(3), 296-333.
- Lin, Qihua. (2002). "Consumers information search when making investment decisions", MS Thesis, Renmin University of China, China
- Loibl, C., and Hira, T. (2009). "Investor information search", *J. Econ. Psychol.*, 30(1), 24-41.
- Lovric, M. (2011). "Behavioral finance and agent-based artificial markets", PhD Thesis, Erasmus University Rotterdam, Netherlands.
- Moore and Lehman. (1980). "Individual differences in search behavior for a nondurable", *Journal of consumer research*, 7 (3), 296-307.
- Murphy, and G. N. Soutar. (2004). "What individual investors value: Some Australian evidence", *Journal of Economic Psychology*, 25, 539-555.
- Murray., and Keith, B. (1991). "A Test of Services Marketing Theory: Consumer Information Acquisition Activities", *Journal of Marketing*, 55, 10-25.
- Nagy, R., and Obenberger, R. (1994). "Factors influencing individual investor behavior", *Financial Analysts Journal*, 50(4), 63-68.
- Ohlson, J.A. (1975). "The complete ordering of information alternatives for a class of portfolio selection models", *Journal of Accounting Research*, 267-82.

- Peress, J. (2004). "Wealth, Information acquisition and portfolio choice", *The Review of Financial Studies*, 17(3), 879-914.
- Price, L. L., and Feick, L. F. (1983). "The role of interpersonal sources in external search: An informational perspective", *Advances in Consumer Research*, 11, 250-255.
- Quadrel, M. J., Fischhoff, B., Davis, W. (1993). "Adolescent invulnerability", *Am. Psychol.* In press
- Quadrini, V., and J.-V. Rios-Rull (1997). "Understanding the U.S. Distribution of Wealth", *Federal Reserve Bank of Minneapolis Quarterly Review*, 21, 22-36.
- Rana, M. Hifza., M. Saqib., N. Fareeha., D. Inam., and R. Kashif. (2011). "Effects of demographic factors on risky decision-making behavior", *European Journal of Social Sciences*, 26 (1), 69-76.
- Rao, H., Greve, H., and Davis, G. (2001). "Fool's gold: Social proof in the initiation and abandonment of coverage by Wall Street analysts", *Administrative Science Quarterly*, 46, 502-526.
- Riley and Victor. (1992). "Asset allocation and individual risk aversion", *Financial Analysts Journal*, 48 (6), 32-37.
- Schmidt, Jeffrey, B., and Spreng, R. (1996). "A proposed model of external consumer information search", *Journal of the Academy of Marketing Science*, 24, 246-256.
- Shah, A., and Oppenheimer, D. (2008). "Heuristics made easy: an effort reduction framework", *Psychological Bulletin*, 134(2), 207-222.
- Shanteau, J. (1989). "Cognitive heuristics and biases in behavioral auditing: Review, comments, and observations", *Accounting, Organizations, and Society*, 14, 165-177.
- Shefrin, H. (2000). "Beyond greed and fear: Understanding behavioral finance and the psychology of investing", Boston: Harvard Business School Press
- Shum, P., and Faig, M. (2006). "What explains household stock holdings?", *Journal of Banking and Finance*, 30(9), 2579-2597
- Simon, H. A. (1990). "Invariants of human behavior", *Ann. Rev. Psychol.*, 41(1), 1-19
- Sirdeshmukh, Deepak., Jagdip, S., and Barry S. (2002). "Consumer Trust, Value, and Loyalty in Relational Exchanges", *Journal of Marketing*, 66 (1), 15-37.
- Sitkin, S., and Pablo, A. (1992). "Reconceptualizing the determinants of risk behavior", *The Academy of Management Review* 17 (1), 9-38.
- Sitkin, S., and Weingart, L. (1995). "Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity", *The Academy of Management Journal*, 38(6), 1573-1592.
- Sunden and J. Surette. (1998). "Gender differences in the allocation of assets in retirement savings plans", *The American Economic Review*, 88 (2), 207-211.
- Tseng, S., and Yang, C. (2011). "Influence of information search on risky investment preferences: Testing a moderating role of income", *Proceedings of the 3rd International on Information and Financial Engineering*, 19-21 August, Shanghai, China: IEDRC.
- Tseng, S., and Yang, C. (2011). "The role of information searches in investment choice variation: Digital information, advice seeking and heuristics", *African Journal of Business Management* 5 (12), 4934-4944.
- Tversky, A., and Kahneman, D. (1973). "Availability: A heuristic for judging frequency and probability", *Cognitive Psychology*, 5(2), 207-232, 1973.
- Tversky, A., and Kahneman, D. (1974). "Judgment under uncertainty: Heuristics and biases", *Science*, 185(4157), 1124-1131.

- Veld, C. (2003). "Warrant pricing: a review of empirical research", *The European Journal of Finance*, 61-91
- Vissing-Jorgensen, A., (1999). "Towards an explanation of household portfolio choice heterogeneity: Nonfinancial income and participation cost structure", Discussion paper, University of Chicago.
- Waldfogel, Joel., and Chen, L. (2003). "Does Information Undermine Brand?", *Information Intermediary Use and Preference for Branded Web Retailers*. NBER Working Paper 9942, Cambridge, MA: National Bureau of Economic Research.
- Warren, W., Stevens, R., and McConkey, C. (1990). "Using demographic and lifestyle analysis to segment individual investors", *Financial Analysts Journal*, 46(2), 74-77.
- Woodruff, B. (1997). "Customer Value: The Next Source of Competitive Advantage", *Journal of the Academy of Marketing Science*, 25 (2), 139-153.
- Yale, L. J., and Gilly, M. C. (1995). "Dyadic perceptions in personal source information search", *Journal of Business Research*, 32, 225-237.
- Zeithaml, V. (1988). "Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence", *Journal of Marketing*, 52(3), 2-22.
-