

Risk-taking in Investment Choices: Testing the Effects of Information Search

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Abstract: Risk-taking in investment decision-making has been a means to create individual wealth. Investor psychological factors and information searches receive substantial attention in risk-taking in investment choices. This article aims to test the role of information search between individual psychological factors, risk aversion and self-control, and investment preferences. 233 experienced investors were surveyed and structural equation modeling was employed. We find that both risk aversion and self-control have strong direct effects on stocks/options investment preferences, and have indirect effects on mutual fund preferences through the demands of information searches including digital information search and seeking advice (this is especially true for the latter.) Implications for financial consultants are discussed as well.

Key words: Risk aversion, Self-control, Digital information search, Advice-seeking information search, Investment preferences

INTRODUCTION

Risk-taking in investment decision-making has been a means to create individual wealth. Under uncertainty, influenced by psychological factors, an individual may assess economic loss (Sitkin, S., L.R. Weingart, 1995), and in turn develop risk-reducing strategies (such as information search), to subsequently make decisions (Taylor, J.W., 1974). The effects of investor psychological factors and information search on investment decision-making have received substantial attention in financial research (Howcroft, B., 2003). Most studies focus on the direct effects of these variables on investment decision behavior (Shum, P., M. Faig, 2006). However, based on Taylor's (1974) theory of risk taking in consumer behavior, risk-reducing strategies such as information searches play a central role in the relationship between individual psychological factors and the decision to buy under uncertainty. Few empirical research studies have focused on the central role of information search in risky investment decisions. Thus, this article aims to develop and further test a central role of information search in investment choices

Taking into account psychological factors, behavioral finance recently has "achieved impressive strides in explaining the behavioral aspects of investment decisions" under uncertainty (Nagy, R.A., R.W. Obenberger, 1994). Risk aversion and self-control are two important behavioral psychological elements in risky investment decision-making (Shefrin, H.M., M. Statman, 1985). Risk-averse individuals tend to overestimate the likelihood of loss. This tendency influences risky investment choices and information searches (Money, R.B., J.C. Crotts, 2003). Self-control has an important role in decision-making by individuals with two sets of preferences that conflict at a point in time (Thaler, R.H., H.M. Shefrin, 1981). This conflict affects individual investment decisions and information-acquisition decisions (O'Donoghue, T., M. Rabin, 2003). This study thus considers two possible determinant psychological factors, risk aversion and self-control, in a proposed model.

Two research questions are proposed: One, how important is risk aversion and self-control to individual investment choices? Two, how do information searches affect individual investment preferences? This paper addresses these questions by dividing risky investments into the two dimensions of stocks/options and mutual funds investments. We thus expect to enrich our understanding of individual risk-taking in investment choices.

Literature Review and Hypotheses:

In this article, we build on the logic of Taylor's (1974) risk-taking theory to present a research model. Taylor (1974) describes three principal stages that individuals proceed through for decision-making under uncertainty. The first stage concerns individual psychological factors, where perceived risk and social-esteem influence anxiety. The second stage features the development of risk-reducing strategies, where individuals assess social/economic loss and highlight information acquisition and handling. The last stage indicates the decision to buy.

Recently, behavioral finance becomes a valuable issue in "enriching our understanding of financial markets by adding a human element" (Thaler, R.H., 1999). Risk aversion and self-control are two important behavioral psychological elements in both individual investment choices (Kahneman, D., M.W. Riepe, 1998) and information search. Drawing on behavioral finance perspective, we view investors are influenced by their risk aversion attitude and self-control, and can search information to make risky investment decisions.

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This article follows the logic of Taylor’s (1974) risk-taking theory: individual psychological factors - risk-reducing strategies - decision to buy. Risk aversion and self-control, as mentioned above, are two psychological factors in this article. Information searches are referred to the development of risk-reducing strategies. Information on financial measures (called digital information here) and from advice are two variables in this article. In addition, taking into consideration psychological factors substantial effects in investment decisions, the influences of risk aversion and self-control on investment preferences will be explored in this study. Accordingly, this article proposes a research model that both risk aversion and self-control have a double effect on investment preferences: a traditional direct effect and an indirect effect via the information searches, as shown in Figure 1. We formulate our research hypotheses as follows.

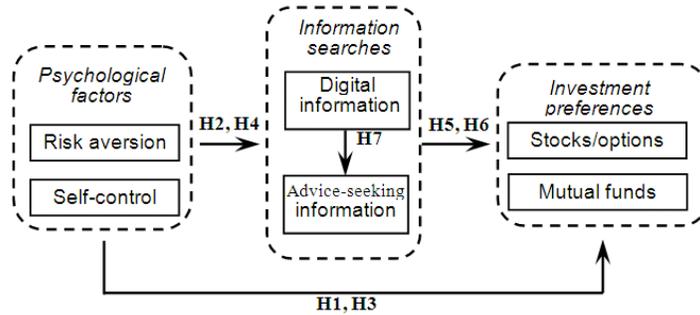


Fig. 1: Research Model.

Risk aversion:

Risk is “most commonly conceived as reflecting variation in the distribution of possible outcomes, their likelihoods, and their subjective values (March, J.G., Z. Shapira, 1987)” in classical decision theory. Risk aversion refers to an individual’s current tendency to avoid risks. In behavioral finance, Kahneman and Tversky (1979) state that an individual has inconsistent risk tendencies under risky choices. They argue that an individual tends to be “risk-averse in choices involving sure gains and to be risk-seeking in choices involving sure losses (Kahneman, D., A. Tversky, 1979).”

Risk-averse individuals tend to overestimate the likelihood of loss. This tendency is a main factor in the impact of risk-aversion on the risk-taking processes, such as in decreasing the interest to purchase risky investments or increasing efforts for information search. For example, Pennings and Smidts (2000) find that more risk-averse individuals will “express stronger intentions to reduce the fluctuations in net income” (p. 1344). Thus, they are less likely to purchase riskier investments. Money and Crotts (2003) find that the more risk-averse individuals favor seeking help by utilizing professional information. Accordingly, we hypothesize:

Hypothesis 1 Risk aversion negatively influences investor preferences for (a) stocks/options investments or for (b) mutual funds investments.

Hypothesis 2 Risk aversion positively influences investor’s (a) digital information search or (b) advice-seeking information search.

Self-control:

Self-control (Thaler, R.H., H.M. Shefrin, 1981) refers to the concept that an individual, viewed as an organization, is assumed to be both a farsighted planner and a myopic doer at a point in time. Fisher and Statman (1997) argue that behavioral investors have difficulty with self-control, and so mutual fund companies use plans or contracts for investment profiles to help investors to overcome their self-control problem. Glick (1957) states that the self-control problem is viewed as the investors’ weak willpower to realize gains or losses at the proper stop-gain or stop-loss points.

Some studies incorporate optimism in the concept of self-control and find that optimists tend to have greater self-control (Puri, M., D.T. Robinson, 2007). They perceive themselves as having more willpower for self-control, leading them to prefer taking more risk, such as risk investment preferences. Accordingly, we expect that investors with greater self-control believe that they understand the risks that they are exposed to (Kahneman, D., M.W. Riepe, 1998), and that they are more likely to purchase risky investments. We test the following hypothesis:

Hypothesis 3 Investor’s perceived self-control positively influences his/her preferences for (a) stocks/options investments or for (b) mutual funds investments.

Some studies apply self-control problems to information acquisition decision (Brocas, I., J.D. Carrillo, 2003) and to report the conflict between immediate costs and future benefits of information search actions. Facing such conflict, individuals with self-control problems are more likely to delay information searches.

Based on the argument above, we expect that people with greater self-control are more likely to have the foresight to search information in order to obtain future benefit of information search actions. Hence:

Hypothesis 4 *Investor's perceived self-control positively influences his/her investor's (a) digital information search or (b) advice-seeking information search.*

Information Search:

Moutinho (1987) defines information search as “an expressed need to consult various sources prior to making a purchase decision (Fodness, D., B. Murray, 1999).” Most studies focus on using information about the financial product, called digital information here, and seeking advice information in financial decision-making.

Digital Information:

Digital information refers to the information about the financial products, such as firms' expected earnings and financial statements. Early studies examine the informational determinants influencing individual investor behavior, based on economic perspectives. Results find some crucial determinants on corporate accounting information, including expected dividends, long-term growth, financial stability, and future expectations (Clark-Murphy, M., G.N. Soutar, 2004; Lee, J., J. Cho, 2005). Thus, we expect that digital information search will increase individual interest in financial investments because investors might reduce their uncertainty via great understanding of a company's financial status, based on economic perspectives. Hence we hypothesize:

Hypothesis 5 *An Investor's digital information search positively influences his/her preferences for (a) stocks/options investments or for (b) mutual funds investments.*

Advice-Seeking Information:

Seeking advice, such as from professional financial advisors (Shum, P., M. Faig, 2006), from friends/relatives (Nagy, R.A., R.W. Obenberger, 1994), and from magazines/brochures published by financial institutions (Lee, J., J. Cho, 2005), is especially necessary since investors now have a greater choice of investment products due to the diversification of financial investments (Warren, E.W., 1990). Moreover, due to the lack of understanding for various investments, investors may seek advice and education from professional advisors. They especially seek out face-to-face contact when choosing more complex investments. Studies on financial investments demonstrate the positive association between advice-seeking information search and individual investor behavior. This association remains positive across time. Accordingly, we hypothesize:

Hypothesis 6 *An investor's advice-seeking information search positively influences his/her preferences for (a) stocks/options investments or for (b) mutual funds investments.*

Recent advances in the technology of information search make the acquisition of digital information much easier and less expensive than before. This increased information may generate information overload for investors (Johnson, E.J., 2001). In this light, we expect that investors who are more likely to search digital information understand that more digital information is not always better. In order to find the needed information from digital information searching, they may prefer to seek professional help. Thus:

Hypothesis 7 *Investor's digital information searches positively influences his/her advice-seeking information searches.*

Methods:

Instrument Development and Data Collection:

To evaluate investor attitudes and behavioral intentions in risky investment decision-making, the survey instrument measurement was a psychometric scale developed from the literatures as follows. Risk aversion is defined as an investor's current tendency to avoid risks in the gain domain, based on the prospect theory (Kahneman, D., A. Tversky, 1979), and was measured with three items that reflect the tendency to realize economic gains. Self-control was measured with four items that reflect the self-recognized willpower to realize gains or losses at appropriate stop-gain or stop-loss points, as shown in Table I.

Digital information search was assessed by three items which measured the investor's tendencies to make information searches to evaluate a firm's expected earnings, financial statements, and the status of its products/services. Advice-seeking information search were performed by three items which measured the investor's tendency to seek help from professional financial advisors, family, friends, and published materials (e.g. magazines and brochures from financial institutions). Investment preferences, according to the control orientation, were measured by five items to reflect the tendency of individual investment preferences. Items of stocks/options investments included stocks, futures, options, and real estate. The items of mutual funds investments included domestic and foreign mutual funds.

All of the items were measured on a five-point Likert scale (1= strongly disagree, 3= neither agree nor disagree, and 5= strongly agree). Pretest was conducted by 42 investors and the Cronbach's α of scales was acceptable with the minimum score being above 0.7.

A total of 233 successful questionnaires with financial investment experience were obtained from five securities companies and five banks in Taipei, Taiwan (effective response rate: 92.4%). Of the respondents,

62.2% were females, 60.5% were in the 26-40 year old group and 26.2% were more than 40 years old. 51.1% were married, 65.2% had at least a university degree, and 44.6% earned annual incomes of US \$20,000 or more.

Table I: Items of risk aversion and self-control.

Risk aversion // Sources: (Kahneman, D., A. Tversky, 1979; Shefrin, H.M., M. Statman, 1985)	
RAV1	I would like to realize the gain as soon as the stock increases in price.
RAV2	Considering a stock purchased one month ago for \$100, it is found that the stock is now selling at \$110. After hold the stock for one more period, there are 50-50 odds between gaining an additional \$10 or "breaking even." I would like to sell the stock to realize the \$10-gains now.
RAV3	I would like to realize the (substantial financial) gains from stocks more than to realize the (substantial financial) losses from stocks.
Self-control // Sources: (Shefrin, H.M., M. Statman, 1985; Thaler, R.H., H.M. Shefrin, 1981; Glick, I., 1957)	
SCO1	I could set a stop-loss point at an appropriate price.
SCO2	I could set a gain-loss point at an appropriate price.
SCO3	I could make loss realization at a (predetermined) stop-loss point.
SCO4	I could make gain realization at a (predetermined) stop-gain point.

Data Analysis and Result:

Developing Measurement Models With CFA:

Data analysis was performed according to a two-step methodology. LISREL 8.5 was used for data analysis with a confirmatory factor analysis (CFA) as the first stage to assess the reliability and validity of the measures. The second stage, the structural relationships were examined by path analysis.

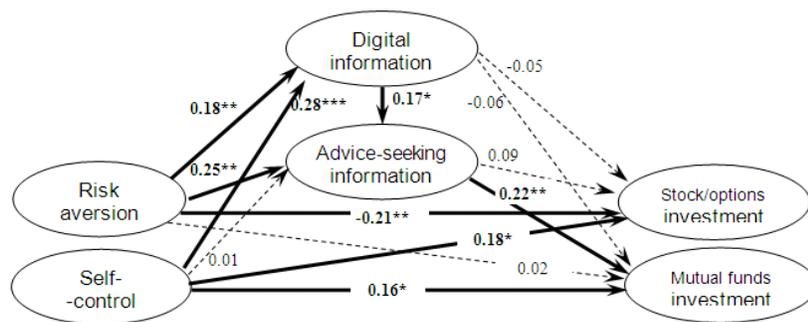
The CFA showed acceptable fit indices with the chi-square/df ratio for this model being 2.088 (since $250.51/120 = 2.088$), NNFI=0.90, CFI=0.92, and RMSEA=0.068. Convergent validity of the measurement model was assessed by the composite reliabilities (CR) and the average variance extracted (AVE). CR for each construct was greater than 0.7, with the values ranging from 0.76 to 0.91. The AVE for each construct was greater than 0.5, with the value form 0.52 to 0.84. Thus, convergent validity is demonstrated. The chi-square difference test was used and supported the discriminant validity.

Testing of the Structural Model:

First, goodness of fit indices for the structural model were checked. As shown in Figure 2, the structural model presented acceptable fit indices, with the chi-square/df ratio being 2.217 (since $268.28/121 = 2.217$), NNFI=0.89, CFI=0.91, and RMSEA=0.072.

Path analysis: The results of path analysis were as shown in Figure 2. Six of seven hypotheses were supported/sub-supported, including H1a ($\beta = -0.21, p < 0.01$), H2a,b ($\beta = 0.18, p < 0.01$ and $\beta = 0.25, p < 0.01$ respectively), H3a,b ($\beta = 0.18$ and 0.16 respectively, both $p < 0.05$), H4a ($\beta = 0.28, p < 0.001$), H6b ($\beta = 0.22, p < 0.01$), and H7 ($\beta = 0.17, p < 0.05$).

Summary: In stocks/options investment decision-making, the findings suggest psychological factors are stronger determinants than information searches, where risk aversion is the most powerful factor; on the other hand, information searches play a prominent central role between psychological factors and mutual funds investment preference.



Note: the dotted lines indicate non-significant relationships between constructs; the solid lines indicate that significant relationships between constructs; *p < 0.05, **p < 0.01, ***p < 0.001

Overall fit indices:
 chi-square/df ratio=268.28/121 = 2.217,
 NNFI=0.89, CFI=0.91, GFI=0.89, AGFI=0.84,
 RMR=0.039 and RMSEA=0.072,

Fig. 2: Standardized Data Analysis Results.

Discussion and Conclusion:

This findings offer several contributions and implications for risk-taking in investment choices.

Direct Effects of Risk Aversion and Self-Control:

One contribution of this paper is to provide empirical evidence that risk aversion and self-control could indeed be a powerful determinant in individual investment risk-taking. The effects of self-control on both types of risky investment preferences are remarkably consistent. This finding suggests that individuals with greater self-control in realizing their gains or losses as planned are more likely to take more risk in investment choices, which is in agreement with Puri and Robinson.

The results of the significant effects of risk aversion and self-control on investors' risky investment choices imply that the movement to teach financial students to recognize investor psychology is not new (Shefrin, H.M., 2000), but might be required to be more extensive. Furthermore, although the results show consistently significant positive effects of self-control on two types of investment choices, it is worth noting the possible overestimation of self-control. This viewpoint implies that an enforced contract seems to be necessary to mitigate conflicts in the potential biases of judgment.

Effects of Information Search:

Another contribution lies in the empirical support for the contention that information searches play a prominent central role in risk-taking in mutual fund investment decision-making, but not so in stocks/options investment.

Our results suggest that individuals with greater risk aversion are more likely to increase information seeking from both digital and advice-seeking information, with especially more from the latter. Afterwards, there are two routes from information searches to mutual funds investment. (1) Advice-seeking information searches have the strongest positive influence on mutual fund investment choices. This result might explain that precise information acquisition through advice-seeking information search may decrease individual concerns with potential losses (Peress, J., 2004), and thus increase interest in mutual fund investment.

(2) In contrast, digital information search has a weak influence on mutual fund investment choices, but digital information searching increases advice-seeking information searching, which in turn increases individual interest in mutual funds choices. This finding indicates that as investors would like to search for digital information, they might suffer from information overload because advances in computer technology make information acquisition much easier than ever before. This implies that more information is not always better. However, more information may be better when it comes from people knowledgeable in more complex investments, such as mutual funds. Thus, sufficient and organized information offered from financial consultants might be more effective in encouraging supporting appropriate individual choices for mutual funds.

Limitations and Future Research:

This study finds that digital information search has little effect on risky investment intentions, not matching the original assumptions of H5a and H5b. A possible reason is the problem of information asymmetry from insufficient corporate disclosure (Sabovic, S., 2010). "Corporate disclosure provides investors with a common pool of knowledge (Yoon, H., 2010)," such as financial statements, accounting, and forecasts (Sabovic, S., 2010). Although investors are more likely to search digital information, they might worry about the problem of information asymmetry due to insufficient corporate disclosure for investment decisions. This concern may limit the effect of digital information search on risky investment intentions.

The findings show that information search has a limit to play a central role between investor psychological factors and stocks/options investment preferences. This result suggests that whether investors use other information searches for a risk-reducing strategy in their risk taking in stocks/options investments. These are the areas for future research.

In addition, although more precise information might decrease individual concerns over potential losses, which induces investors to hold more stocks, the obtainment of precise information is always costly. Further research could include personal wealth as a moderating factor that might further explain our results.

REFERENCES

- Brocas, I., J.D. Carrillo, 2003. Information and Self-Control. In I. Brocas & J. D. Carrillo (Eds.), *The Psychology of Economic Decisions. Vol. 1: Rationality and Well-Being*, (pp. 89-104). Oxford: Oxford University Press.
- Clark-Murphy, M., G.N. Soutar, 2004. What individual investors value: Some Australian evidence. *Journal of Economic Psychology*, 25: 539-555.
- Fisher, K.L., M. Statman, 1997. Investment advice from mutual fund companies. *Journal of Portfolio Management*, 24(1): 9-25.

- Fodness, D., B. Murray, 1999. Tourist information search. *Annals of Tourism Research*, 24(3): 503-523.
- Glick, I., 1957. *A social psychological study of futures trading*. Unpublished doctoral dissertation, Department of Sociology, University of Chicago.
- Howcroft, B., P. Hewer, R. Hamilton, 2003. Consumer decision-making styles and the purchase of financial services. *Service Industries Journal*, 23(3): 63-81.
- Johnson, E.J., 2001. Digitizing consumer research. *Journal of Consumer Research*, 28: 331-336.
- Kahneman, D., A. Tversky, 1979. Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2): 263-291.
- Kahneman, D., M.W. Riepe, 1998. Aspects of investor psychology. *Journal of Portfolio Management*, 24(4): 52-65.
- Lee, J., J. Cho, 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.
- March, J.G., Z. Shapira, 1987. Managerial perspectives on risk and risk taking. *Management Science*, 33(11): 1404-1418.
- Money, R.B., J.C. Crofts, 2003. The effect of uncertainty avoidance on information search, planning, and purchases of international travel vacations. *Tourism Management*, 24: 191-202.
- Moutinho, L., 1987. Consumer behaviour in tourism. *European Journal of Marketing*, 21(10): 5-44.
- Nagy, R.A., R.W. Obenberger, 1994. Factors influencing individual investor behavior. *Financial Analysts Journal*, 50(4): 63-68.
- O'Donoghue, T., M. Rabin, 2003. Self awareness and self Control. In G. Loewenstein, D. Read & R. Baumeister (Eds.), *Time and decision: economic and psychological perspectives on intertemporal choice*, (pp. 217-243). New York: Russell Sage Foundation.
- Pennings, M.E., A. Smidts, 2000. Assessing the construct validity of risk attitude. *Management Science*, 46(10): 1337-1348.
- Peress, J., 2004. Wealth, information acquisition, and portfolio choice. *The Review of Financial Studies*, 17(3): 879-914.
- Puri, M., D.T. Robinson, 2007. Optimism and economic choice. *Journal of Financial Economics*, 86: 71-99.
- Sabovic, S., S. Miletic, S. Sabovic, 2010. The impact of the crisis on financial reporting, accounting and auditing. *Technics Technologies Education Management*, 5(3): 613-620.
- Shefrin, H.M., 2000. *Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing*. Boston: Harvard Business School.
- Shefrin, H.M., M. Statman, 1985. The disposition to sell winners too early and ride losers too long: Theory and evidence. *Journal of Finance*, 40(3): 777-790.
- Shum, P., M. Faig, 2006. What explains household stock holdings? *Journal of Banking & Finance*, 30: 2579-2597.
- Sitkin, S., L.R. Weingart, 1995. Determinants of risky decision-making behavior: A test of the mediating role of risk perceptions and propensity. *Academy of Management Journal*, 38(6): 1573-1592.
- Taylor, J.W., 1974. The role of risk in consumer behavior. *Journal of Marketing*, 38: 54-60.
- Thaler, R.H., 1999. The end of behavioral finance. *Financial Analysts Journal*, 55(6): 12-17.
- Thaler, R.H., H.M. Shefrin, 1981. An economic theory of self-control. *Journal of Political Economy*, 89(2): 392-406.
- Warren, E.W., R.E. Stevens, C.W. McConkey, 1990. Using demographic and lifestyle analysis to segment individual investors. *Financial Analysts Journal*, 46(2): 74-77.
- Yoon, H., H. Zo, A.P. Ciganek, 2010. Does XBRL adoption reduce information asymmetry? *Journal of Business Research*, 64: 157-163.