

INFORMATION ACQUISITION AND INVESTMENT DECISIONS ON THE INTERNET: AN EMPIRICAL INVESTIGATION

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With intensifying competition, the significance of understanding customer characteristics related to information acquisition and decision making on the Internet has increased. An understanding of customer characteristics can become a crucial element in the development and implementation of marketing strategy. This paper examines the influence of some key demographic and psychological variables on information acquisition and investment decisions on the Internet, related to mutual funds. Findings indicate that product familiarity, age, and information breadth significantly influenced information acquisition. For investment decisions on the Internet, in addition to the above-mentioned variables, sex and overconfidence was also significant.

INTRODUCTION

Sales over the Internet have been growing despite the failure of some dot-com companies. One area which has been a part of this trend is online investing. The growth in sales has occurred due to the availability of financial information on the Internet and the convenience of conducting online transactions. Considering the growing significance of online investments, this paper attempts to understand the demographic and psychological characteristics of investors who are more likely to use the Internet for information acquisition and investment decisions related to mutual funds. To achieve our goals, we have divided the paper into four sections. In the first, we review the literature and present the hypotheses; in the second, we present the method and model; in the third, we discuss findings; and in the fourth, we cover theoretical implications and suggestions for future research. Overall, the paper attempts to add to the literature on mutual fund investments, product adoption, and the growing research on cyber marketing. The findings of this paper have strategic and practical implications for financial companies

marketing their products and services over the Internet.

Marketers recognize that when the technology is new, as in the case of the Internet, they must acquire customers before they can retain them. As such, it is important for them to find out the characteristics of customers who are more likely to go online to acquire information and make investments. This understanding has strategic implications for them. It will allow them to use this knowledge to effectively design and implement their Internet based marketing offerings to attract new customers and retain existing ones—two significant marketing goals for any firm.

LITERATURE REVIEW AND HYPOTHESES

With stakes high and outcomes difficult to predict, investment decisions can justifiably be regarded as non-routine decisions. The decision is complex because investors confront multiple sources of information, with each source differing in terms of reliability and cost. And adding to the complexity of decision making are diverse investment options, with the options differing in terms of stock composition, inherent risk, and income potential. Further compounding this complexity is the

incessant flow of advertisements and solicitations by telebrokers, seeking to attract new customers or maintain existing ones. In this high involvement decision environment, investors have to make two important decisions: where to acquire information and where to conduct their investment transactions.

The Internet, as a new technology, is now available to financial companies both as a medium of communication and channel of distribution. The potential use of the Internet for conducting business transactions has received much attention in the literature (Kaplan and Sawhney 2000; Alba et al. 1997; Camp and Sirbu 1997). As part of their value-creating activities on the Internet, firms construct Web sites to communicate with customers and persuade them to buy financial products and services. They also use the Internet as a channel of distribution through which they deliver financial products and services. Thus, from a business perspective, strategic advantages will accrue to those firms that can more effectively segment and efficiently target their markets to increase the adoption rate of their offerings. However, to achieve this goal they will need to know the characteristics of consumers who are more likely to use the Internet for acquiring information and making investment decisions. From investors' perspectives and with regard to information acquisition and investment decisions, the Internet provides different choices. They can use the Internet as their primary contact medium with their investment advisor, receive periodic reviews of their investment allocation, and get performance reports for these investments. They can also use the Internet for conducting transactions. The segmenting and targeting question, therefore, is: What are the characteristics of investors who are more likely to use the Internet for acquiring information and conducting transactions?

Attitude Towards Risk and Return

Risk is inherent in acquiring information and making investment decisions, because both the value of information and the effectiveness of decisions are determined by outcomes in the future. It is well established in finance theory that investment decisions involve a trade off between risk and return. That is, risky assets must compensate risk averse

investors with higher expected returns (Huang and Litzenberger 1988). As such, investors' attitudes toward risk and return shape their investment decisions. In marketing, the literature on new product adoption is also vast, having attracted extensive scholarly attention (Rogers 1995; Mahajan et al. 1990; Sultan 1993). However, this stream of research has not taken into account the influence of investor attitudes toward risk and return on the adoption of an innovation such as the Internet for information acquisition and investment decisions. Risk averse investors will be more likely to play it safe, and as such will be less likely to make investment decisions on their own, preferring the advice of their brokers. They will also not be open to using the Internet for receiving information on the fund's performance. We, therefore, propose the following hypotheses:

- H₁:** Investors preferring higher risk and returns will be more likely to receive performance reviews of their funds on the Internet.
- H₂:** Investors preferring higher risk and returns will be more likely to make investment decisions on the Internet.

Age

As an explanatory variable, age is widely used in many social disciplines, including marketing. The literature in marketing on the influence of age on different aspects of consumer behavior indicates, in general, that people's information acquisition strategy, preferences, and behavioral modality change with age and life's changing circumstances (Beatty and Smith 1987; Klippel and Sweeny 1974). Research in marketing has also attempted to understand the influence of age on media habits. The findings indicate that the elderly watch TV more than younger age segments (Graney and Graney 1974; Hutson, et al. 1992; Ross 1982) and use TV more than newspapers as their primary source of information (Stephens 1981). The study of the influence of age on the use of new technology such as automated teller machines (ATMs) and credit cards is quite extensive in marketing. Research suggests that younger people are more likely to use credit cards (Porter et al. 1979) and that

preference for ATMs declines with age (Bednar et al. 1995). The existing research also suggests that as people move up on the lifecycle curve, they become more cautious and seek greater certainty in their decisions (Botwinick 1973). With age, people also exhibit more negative perceptions of technologies and greater reluctance to use them (Phillips and Sternthal 1977; Pommer, Berkowitz and Walton 1980). In particular, Gilly and Ziehl (1985) found that the elderly showed a higher reluctance to adopt technological innovations. As the Internet is best characterized as a discontinuous innovation, we propose the following:

- H₃:** Older investors will be less likely to receive performance reviews of their funds on the Internet.
- H₄:** Older investors will be less likely to make investment decisions on the Internet.

Sources of Information

A distinguishing feature of today's marketing environment is the availability of multiple sources of information. As any textbook on marketing or consumer behavior would show, information acquisition precedes decision making. Whether investors acquire information from interpersonal and impersonal sources, they are concerned with both source credibility and information quality. Capon, Fitzsimons and Prince (1996), however, note the scarcity of hard data concerning the relative importance that "investors place on these various information sources" (p. 63). Investment decisions are regarded as high involvement decisions. To make these decisions, investors will attempt to get information from different sources to increase product knowledge. Investors who acquire information from multiple sources will be more likely to make decisions on their own. Furthermore, they will also be receptive to receiving information from different sources including the Internet. We, therefore, propose the following:

- H₅:** Investors who get their information from multiple sources will be more likely to receive performance reviews of their funds on the Internet.

- H₆:** Investors who get their information from multiple sources will be more likely to make investment decisions on the Internet.

SEX. In finance, the study of gender differences on investment decisions suggests that women tend to invest their retirement funds in less risky vehicles than men (Bajtelsmit and Van Derhei 1997; Hinz et al. 1997). Although both men and women show overconfidence, men are generally more overconfident than women (Lundeberg, Fox and Puncchar 1994). Overconfidence has been posited to influence investors' behavior, including the frequency with which they invest. This high level of overconfidence in men has been shown to be task dependent, that is, men are more likely to be overconfident about tasks that fall in the masculine arena. Finance is one of these tasks in which men in general feel more competent than do women (Prince 1993). In their study, Lewellen et al. (1977) found that men rely less on their brokers and make more transactions, among other things. As such, one would expect that men, given their confidence level, would be more inclined to receive information and to make investment decisions on the Internet than women would. We, therefore, propose the following:

- H₇:** Men would be more likely than women to receive performance reviews of their funds on the Internet.
- H₈:** Men will be more likely to make investment decisions on the Internet.

Product Familiarity

The frequency of use of a product results in product familiarity. As the frequency of use increases the comfort level of consumers, they tend to experiment with different uses of the product. Rugimbana and Iversen (1994) found differences between users and non-users of ATMs based on their ease of using ATMs. Product use apprehension declines as usage increases, resulting in greater acceptance of new offerings associated with the product. The Internet can be used both for acquiring information and conducting transactions. The more traditional use of the Internet is for acquiring information and the

more recent use of the Internet is for conducting transactions. People who are more familiar with the Internet will be more likely to use the Internet both for acquiring information and conducting transactions. We, therefore, propose the following:

- H₉:** Investors who are more familiar with the Internet will be more likely to receive performance reviews of their funds on the Internet.
- H₁₀:** Investors who are more familiar with the Internet will be more likely to make investment decisions on the Internet.

METHOD

Questionnaire and Sample. To test the hypotheses, a survey questionnaire was used to elicit responses from mutual fund investors. The questionnaire went through the recommended iterations before the final version was developed, and the questionnaire was mailed to 5000 mutual fund investors whose names and address were provided by four national mutual fund companies. Responses from 262 investors were received, giving an overall response rate of 5.26 percent. While the response rate is low, survey research in finance generally does not achieve a high response rate, due to the reluctance of respondents to divulge financial information. Multiple regression technique was used to test the hypotheses. A listwise deletion procedure was utilized, resulting in 167 observations for the performance review model and 168 for the investment decision model.

Model

For each of the two dependent variables, a separate regression model was developed. The two dependent variables are: (1) receiving information on fund's performance on the Internet and (2) using the Internet to conduct mutual fund transactions. These two questions were asked on a Likert-type scale, anchored by "definitely use" and "definitely will not use." The five independent variables are attitude towards risk and return (Likert scale, anchored by "I avoid risk, accept low returns" and "I seek high returns, accept high risk"), age (under 25, 25 to 34, 35 to 44, 45 to 54, 55 to 64, over 65), sources of information for making investment decisions

(respondents checked the sources that applied), sex (male or female), and product familiarity (using Internet at least three times a week). Data summary is provided in Table 1.

TABLE 1
Descriptive Statistics for
Performance Review Model

Variables	Mean	Std. Deviation	N
Performance Rev.	3.7605	1.2085	167
Risk	6.3114	1.4845	167
Prod. Familiarity	.6527	.4775	167
Sex	.7365	.4418	167
Age	4.0060	1.3643	167
Info. Source	3.8263	1.8948	167

Descriptive Statistics for Decision Model

Variables	Mean	Std. Deviation	N
Investment Decision	3.0952	1.2960	168
Risk	6.3155	1.4810	168
Prod. Familiarity	.6548	.4769	168
Sex	.7381	.4410	168
Age	4.0119	1.3624	168
Info. Source	3.8274	1.8891	168

FINDINGS

Test of Performance Review Hypotheses

The multiple regression analysis (OLS) is used to test the hypotheses in this study. Hypotheses H1, H3, H5, H7, and H9 concerning performance review are tested using the following regression model:

$$PR = \beta_0 + \beta_1 RISK + \beta_2 AGE + \beta_3 INFO + \beta_4 SEX + \beta_5 PROFAM + \epsilon \quad \text{where:}$$

- PR = performance review of mutual fund investment on the Internet
- RISK = attitude towards risk in making investment decisions

- AGE = age of the respondent investor
 INFISO = number of sources of information used by the respondent
 SEX = gender of the respondent investor
 PROFAM = product familiarity of the respondent investor

Based on the hypotheses (H1, H3, H5, H7, and H9), the following expectations regarding the sign of the regression coefficients are developed: RISK (+), AGE (-), INFISO (+), SEX (+), and PROFAM (+).

Table 2 provides results of cross-section regression estimates for the performance review model. The coefficients which are significant and in the expected direction are: AGE ($t = -3.731$, $p < 0.01$), INFISO ($t = 3.985$, $p < 0.01$), and PROFAM ($t = 5.096$, $p < 0.01$). Overall, these results suggest that: (1) older investors are less likely to use the Internet for performance review of their investments, (2) investors who get their information from multiple sources are more likely to receive performance review of their funds on the Internet, and (3) investors who are more familiar with the Internet are more likely to receive the performance review of their investments on the Internet.

Test of Investment Decision Hypotheses

The OLS regression estimates are also developed for the investment decision hypotheses. Specifically, hypotheses H2, H4, H6, H8, and H10 are tested using the following regression model:

$$ID = \beta_0 + \beta_1 \text{RISK} + \beta_2 \text{AGE} + \beta_3 \text{INFISO} + \beta_4 \text{SEX} + \beta_5 \text{PROFAM} + \epsilon$$

Where the dependent variable ID is the investment decision of the respondent using the Internet. All other variables are defined previously. Using hypotheses H2, H4, H6, H8, and H10, the expected sign of the regression coefficients is as follows: RISK (+), AGE (-), INFISO (+), SEX (+), and PROFAM (+).

TABLE 2

Mutual Fund Performance Review Model

$$PR = \beta_0 + \beta_1 \text{RISK} + \beta_2 \text{AGE} + \beta_3 \text{INFISO} + \beta_4 \text{SEX} + \beta_5 \text{PROFAM} + \epsilon$$

Variable	Coefficient	t-value
Intercept	3.334	6.153***
Risk (+)	0.004	0.676
Age (-)	-0.236	-3.731***
Infso (+)	0.168	3.985***
Sex (+)	-0.120	-0.652
Profam (+)	0.863	5.096***
Adjusted R-square	0.282	
F-value	14.023	

***significant at less than 0.01 level. Expected sign of the regression coefficients are in parentheses. PR measures performance review of mutual fund investment on the Internet, RISK shows attitude towards risk and return in making investment decisions, AGE is the age of the respondent investor, INFISO indicates number of sources of information used by the respondent investor for making investment decisions, SEX is the gender of the respondent investor, and PROFAM indicates product familiarity of the respondent investor.

TABLE 3

Mutual Fund Investment Decision Model

$$ID = \beta_0 + \beta_1 \text{RISK} + \beta_2 \text{AGE} + \beta_3 \text{INFISO} + \beta_4 \text{SEX} + \beta_5 \text{PROFAM} + \epsilon$$

Variable	Coefficient	t-value
Intercept	2.342	3.811***
Risk (+)	0.006	0.857
Age (-)	-0.206	-2.872***
Infso (+)	0.113	2.363**
Sex (+)	0.385	1.846*
Profam (+)	0.759	3.951***
Adjusted R-square	0.192	
F-value	8.395	

***, **, * significant at less than 0.01, 0.05, and 0.10 levels, respectively. Expected sign of the regression coefficients are in parentheses. ID represents the use of the Internet for making decisions. RISK shows attitude towards risk and return in making investment decisions, AGE is the age of the respondent investor, INFISO indicates source of information used by the respondent investor for making investment decisions, SEX is the gender of the respondent investor, and PROFAM indicates product familiarity of the respondent investor.

Table 3 portrays the results of the cross-sectional regression for the investment decision model. The sign of the significant coefficients is in the expected direction. The significant variables are: AGE ($t = -$

2.872, $p < 0.01$), INFSO ($t = 2.363$, $p < 0.05$), SEX ($t = 1.846$, $p < 0.10$), and PROFAM ($t = 3.951$, $p < 0.01$). These results suggest that (1) older mutual fund investors are less likely to make investment decisions on the Internet, (2) mutual fund investors who receive information from multiple sources are more likely to make investment decisions on the Internet, (3) men rather than women are more likely to make investment decisions using the Internet, and (4) mutual fund investors who are frequent users of the Internet are more likely to make investment decisions on the Internet.

DISCUSSION

Recently, marketing and finance scholars have begun to call for more scholarly attention to developments influenced by the Internet. One stream of research that is making considerable headway in both marketing and finance is the profiling of consumers who are more likely to use the Internet. The present study attempts to add to this growing body of knowledge. However, before proceeding with a discussion of the implications of the findings, certain limitations of this research should be acknowledged. While the face validity of the constructs may be considered adequate, the low response rate raises an important issue about the generalizability of findings, and thus about external validity. A low response rate raises the question of whether the data used in testing the hypotheses represents the population. Findings from this study, however, suggest that the problem with external validity may not be as serious, considering the close correspondence between the results of this study and those obtained in the existing literature in both finance and marketing.

The present study supports earlier work in marketing and finance and adds to the body of knowledge on mutual fund investments and adoption of new products. As the existing finance literature would suggest, gender differences were found in the present study, with men more likely to make investment decisions on the Internet. In marketing, the literature suggests that the demographic characteristics of people vary in the different stages of the adoption process. The present study supports this view. Results indicate that people who are more likely to use the Internet for receiving information and making

investment decisions are demographically different than those who are less likely to do so. The group more likely to use the Internet for receiving performance review is younger, more versatile in getting information from different sources, and more frequent users of the Internet. Attitudes toward risk and gender do not influence the use of the Internet for receiving information on fund performance. With regard to the use of the Internet for making investment decisions, the group is more likely to be young males who get their information from multiple sources and are more frequent users of the Internet.

The results have marketing implications for businesses using the Internet as a medium of communication and as a channel of distribution. The profile that emerges of people who are more likely to use the Internet for receiving information can help firms better segment their target markets for delivering messages. With regard to the use of the Internet for conducting transactions, the implications are many. Marketers need to achieve a higher share of the target market that is more likely to use the Internet for conducting transactions early on. The targeting of these customers would mean that the firms would be able to increase their response rate and have an edge over their competitors who are targeting the whole set of consumers. Mutual fund companies can use the demographics and psychological profile to more effectively segment and target their markets.

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