

## **Online Stock Trading: Do Demographics, Internet Usage, and Attitudes Matter?**

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### **Abstract**

*This paper investigates how individuals' demographics may influence their adoption of online stock trading. The results indicate that online stock traders are more likely to be male, have higher levels of education, and have higher levels of income than non-traders. Age was not found to correlate with individuals' adoption of online stock trading. This study also found that online stock traders differ from non-traders in terms of their Internet usage behaviors as well as their attitudes toward the Internet.*

**Keywords:** Online Stock Trading, Demographics, Internet Usage, Attitude

### **1. Introduction**

Since the advent of the Internet, online stock trading has become increasingly popular in the investment market, as the Internet has lowered the transaction and information costs for entering the stock market (Bogan 2008). With more and more individuals trading stocks online, the number of companies that offer online trading has been growing dramatically. This phenomenon has certainly gained research interest. Past studies have investigated various aspects of online stock trading, including adoption of online trading (Konana and Balasubramanian, 2005), online investor satisfaction (Balasubramanian, Konana, and Menon, 2003), online investors' switching behaviors (Chen and Hitt, 2002), and online trading performance (Barber and Odean, 2002; and Looney et al., 2006).

Despite the growing body of research, there is still a lack of understanding of a fundamental question: How do online traders differ from non-traders? Answers to this question have important implications. Theoretically, they advance our knowledge with respect to online stock trading behavior. Practically, they help online stock trading companies develop their targeting strategies to attract potential investors. Therefore, the purpose of this study is to examine how online traders are different from non-traders in terms of their demographics, Internet usage behaviors, and attitudes toward the Internet. The remainder of this paper is structured as follows: First, the theoretical development and hypotheses are provided. Next, the methodology is described and the results are presented. Finally, the paper concludes with discussions of implications and future research directions.

### **2. Theoretical Development**

Numerous studies have shown that demographic differences exist between individuals who participate and those who do not participate in various activities in the online environment (Brashear et al., 2009, Forsythe and Shi, 2003, Hou and Elliott, 2014, Meuter et al., 2005, and Swinyard and Smith, 2003). For example, Brashear et al. (2009) indicated that online shoppers have different demographics than non-shoppers, while Hou and Elliott (2014) showed how online bidders can be different from non-bidders in terms of their demographics. The current study investigated four demographic factors (gender, age, education, and income), each of which has been shown to influence an individual's online behaviors.

It is also well documented that consumers' Internet usage behaviors (e.g., frequency and duration) and their attitudes toward the Internet are significant predictors of their online shopping behaviors (Bhatnagar and Ghose, 2004, Brashear et al., 2009, Forsythe and Shi, 2003, Kuhlmeire and Knight, 2005, and Lohse, Bellman, and Johnson, 2000).

To extend this research stream, this study examined how online traders and non-traders may differ in terms of their frequency of using the Internet as well as three attitudinal constructs: online security concern, convenience, and shopping enjoyment. The following sections provide discussions on these variables and then present their relationships with online stock trading.

### **2.1. Gender**

It has long been recognized that gender differences exist in both online and offline environments. Previous studies have shown that women tend to be store shoppers (Darian 1987), while men are more likely to be online shoppers (Brashear et al., 2009, Forsythe and Shi, 2003, and Rogers and Harris, 2003). Empirical results also indicated that men and women differ under a variety of situations, including attitude toward the Internet (Rogers and Harris, 2003), shopping motivation (Arnold and Reynolds, 2012), store loyalty (Noble, Griffith, and Adjei, 2006), online auction participation (Hou and Elliot, 2010), and technology acceptance (Venkatesh and Morris, 2000).

One possible explanation for men and women's behavioral differences is that they differ in terms of their risk tolerance and perceptions of risk. In general, women are more risk averse than men (Byrnes, Miller, and Schafer, 1999, and Croson and Gneezy, 2009). The literature has shown that women are more risk averse than men in financial decision making (Halek and Eisenhauer, 2001, Jianakoplos and Bernasek, 1998, Powell and Ansic, 1997, and Riley and Chow, 1992). Specifically, Jianakoplos and Bernasek (1998) indicated that, compared to women, men are more likely to invest in risky assets such as stocks. Men and women also have different perceptions of online shopping. For example, Garbarino and Strahilevitz (2004) found that, compared to men, women perceive online shopping as being riskier.

Furthermore, studies have shown that men are more likely to invest in stocks trade more frequently than women (Agnew, Balduzzi, and Sunden, 2003, Barber and Odean, 2001). For example, Barber and Odean (2001) analyzed 35,000 households' stock investments from 1991 to 1997 and found that men traded 45% more than women.

Based on the above analysis, it is reasonable to predict that women may perceive online stock trading as riskier and, as a result, they are less likely to participate in online stock trading than men. Formally,

Hypothesis 1: Men are more likely than women to be online stock traders.

### **2.2. Age**

The literature has provided mixed results in the relationship between age and online shopping behavior. Some studies found that older customers are more likely to purchase online (Forsythe and Shi, 2003) and participate in online auctions (Hou and Elliott 2010), while others have shown that younger customers tend to be online shoppers (Carpenter and Balija, 2010, Swinyard and Smith, 2003). Sorce, Perotti, and Widrick (2005) further indicated that, though older customers search fewer products online than younger customers, there was no significant age difference the number of products purchased online.

Several factors may contribute to those mixed findings. First, the aging process is often associated with a decline in cognitive processing and memory efficiency (Kausler, 1991) and, as a result, elders tend to be less innovative and more reluctant to adopt new technologies. For example, a number of studies have found that younger customers are more likely to adopt new innovations (e.g., mobile shopping) and use self-service technology than their older counterparts (Bigne, Ruiz, and Sanz, 2005, Meuter et al., 2005, and Simon and Usunier 2007); this may explain why younger customers are more likely to shop online, considering that online shopping is indeed a self-service technology and can be innovative and complex at times. Second, the aging process involves social changes, as older people tend to have more discretionary time and better financial status (Moschis, 1996). Considering that online shopping can be time consuming and some younger customers may lack the purchasing power necessary for shopping online, it is not surprising that older people have been found to be frequent online shoppers (Forsythe and Shi 2003).

Though the findings on the relationship between age and online shopping are inconclusive, researchers in economics and finance have long recognized that risk taking decreases with age and older investors tend to hold fewer stocks (Agnew, Balduzzi, and Sunden, 2003, Barber and Odean, 2001, Hallahan, Faff, and McKenzie, 2003, Jianakoplos and Bernasek 2006, and Palsson 1996).

For example, based on survey respondents' observed assets allocation as well as their stated willingness to take risks, Jianakoplos and Bernasek (2006) found that younger people tended to be risk takers. Similarly, Bogan (2005) compared household stock market participation between 1992 and 2002 and found that older households were least likely to increase their investment in stocks. Finally, Barber and Odean (2001) investigated 35,000 households' common stock investments and found that young investors hold more volatile portfolios and that the frequency of trading declines as age increases.

Considering that online stock trading is a self-service technology associated with a high level of risk, it is reasonable to predict that younger people are more likely to be online stock traders. Formally,

Hypothesis 2: Younger people are more likely to be online stock traders.

### **2.3. Education**

Another demographic factor that drives human behavior is education. Education has been found to have a positive relationship with Internet usage. For example, Swinyard and Smith (2003) showed that online shoppers had a higher level of education than online non-shoppers. Carpenter and Balija (2010) investigated how individuals' demographics may influence their retail format choice (e.g., department store and Internet-only retailers) and found that those who frequented Internet-only retailers tended to have a higher level of education. Finally, How and Elliot (2010) demonstrated that online auction participants tended to be more educated.

Education has also been shown to affect individuals' risk taking and investment decisions. Shaw (1996) indicated that people's levels of education positively influence their preferences for taking risk, while several other studies revealed that individuals with a lower level of education tended to hold fewer stocks (Haliassos and Bertaut, 1995, Lawrance, 1991).

Finally, education is related to individuals' information search and information usage behaviors. Studies have shown that more educated people often engage in greater information search and usage (Lin and Lee, 2004, Loibl and Hira, 2009, and Rock, Hira, and Loibl, 2010). For example, Lin and Lee (2010) indicated that people with higher levels of education are more likely to search for more financial information and more likely to search on the Internet. Considering that searching for information is essential in making investment decisions (Loibl and Hira 2009) and one barrier for stock market participation is the cost of information (Haliassos and Bertaut, 1995, and Bogan 2008), it is not surprising that people with higher levels of education are more likely to hold stocks, as they have the required knowledge to perform information search tasks.

Without a certain level of education, it is unlikely that consumers would be able to engage in various online activities, let alone search for financial information and make online stock trades. Based on the above analyses, the following hypothesis is proposed:

Hypothesis 3: People with higher levels of education are more likely to be online stock traders.

### **2.4. Income**

A number of studies have reported significant relationships between individuals' incomes and their online behaviors (Brashear et al., 2009, Forsythe and Shi, 2003, Hou and Elliot, 2010, Meuter et al., 2005, Rock, Hira, and Loibl, 2010, and Swinyard and Smith, 2003). Empirical results have typically indicated that individuals with higher levels of income are more likely to engage in a variety of online activities, including heavy usage of the Internet, online shopping, online information search, online auctions, and so on.

Researchers have also found income to be related to individuals' levels of risk tolerance and their investment decisions (Agnew, Balduzzi, and Sunden, 2003, Haliassos and Bertaut, 1995, Hallahan, Faff, and McKenzie, 2003, Lawrance, 1991, and Shaw, 1996). For example, Hallahan, Faff, and McKenzie (2003) found that people's income levels positively influenced their risk tolerance, while Haliassos and Bertaut (1995) showed that individuals tended to have a higher proportion of stock holdings as their income increased.

Based on the above analysis, the following hypothesis is stated:

Hypothesis 4: People with higher levels of income are more likely to be online stock traders.

## **2.5. Internet Usage**

The literature has shown that consumer usage of the Internet (e.g., frequency and time spent) has a positive effect on their online purchase intention and actual buying behavior (Citrin et al., 2000, Forsythe and Shi, 2000, Kuhlmeire and Knight, 2005, Lian and Cheung, 2001, and Lohse, Bellman, and Johnson, 2000). For example, Kuhlmeier and Knight (2005) surveyed 492 multinational consumers and found that the longer and more frequently people used the Internet, the more likely they would purchase online. Lohse, Bellman, and Johnson (2000) demonstrated that more frequent Internet usage resulted in increased online shopping. Similarly, Forsythe and Shi (2003) showed that consumers with more online experience were more likely to be heavy online shoppers.

One possible reason for the positive relationship between Internet usage and consumer online shopping intention is that as consumers increase their usage of the Internet, they become more familiar and comfortable with the Internet; this increased familiarity often leads to positive associations such as trustworthiness and risk reduction. According to Russell and Lanious (1984), familiarity with an environment tends to increase affective responses toward it. In the online environment, Gefen (2000) showed that familiarity builds trust in the online book industry. Miyazaki, A.D. and A. Fernandez (2001) demonstrated that consumers with a higher level of the Internet usage (i.e., frequency and duration) tended to perceive online shopping as having a lower level of risk. Finally, Benedickus et al. (2010) found that online consumers had higher levels of trust and greater purchase intentions for familiar brands than unfamiliar brands.

Based on the above analysis, it is reasonable to predict that frequent Internet users are more likely to be online stock traders and that they tend to have a higher level of trust in the online shopping environment. Formally, Hypothesis 5: Online stock traders are more likely to be frequent Internet users than non-traders.

## **2.6. Attitude toward the Internet**

It has long been recognized that information security is a major barrier for online shopping (Bhatnagar and Ghose, 2004, Lian and Cheung, 2001, Miyazaki and Fernandez, 2001, and Salisbury et al., 2001). Empirical findings typically suggest that consumers who are concerned about online security are less likely to purchase online. For example, Bhatnagar and Ghose (2004) found that the information security is the most important factor for online shoppers and that there are a large number of online browsers who dislike purchasing online because of their concerns about the online security. Similarly, Lian and Cheung (2001) found that online transaction security was negatively related to individuals' willingness to shop online. Extending these findings to the area of online stock trading, it is expected that investors who trade online will tend to be less concerned about Internet security than those who do not. Formally,

Hypothesis 6: Online stock traders are less concerned about Internet security than non-traders.

The literature has shown that convenience and shopping enjoyment are two major reasons why people shop online (Brashear et al., 2009, Childers et al., 2001, Hou and Elliott, 2010, and Rohm and Swaminathan, 2004). For example, Brashear et al. (2009) showed that online shoppers were more convenience seeking than non-shoppers across six countries, while Hou and Elliott (2010) demonstrated that both convenience and enjoyment seeking were significant drivers of online auction participation. According to these studies, it is reasonable to assume that convenience and shopping enjoyment are two motivations for individuals' online stock trading behavior. Formally,

Hypothesis 7: Online stock traders value the convenience of the Internet more than non-traders.

Hypothesis 8: Online Stock traders value shopping enjoyment more than non-traders.

## **3. Data and Methodology**

The data were collected using the Pew Research Center's Internet & American Life Project survey ([www.pewinternet.org](http://www.pewinternet.org)). The Internet users sample included 200 online stock traders and 1479 non-traders. Demographic variables including gender, age, education, and income were measured. Gender was coded as a dichotomy (1 = Male and 0 = Female). Age was measured as a categorical variable using the following ranges: 1 = 18-29, 2 = 30-49, 3 = 50-64, and 4 = 65 or above. Education categories were 1 = some school, 2 = high school graduate, 3 = some college, 4 = college graduate, and 5 = post-graduate.

Income categories were 1 = less than \$20,000, 2 = \$20,000 to under \$40,000, 3 = \$40,000 to under \$60,000, 4 = \$60,000 to under 100,000, and 5 = \$100,000 or more. Internet usage was measured by the question: “How often do you use the Internet” (daily, several times a week or less often)?

Shopping enjoyment was assessed using the question: “Do you enjoy going shopping or is it just something you have to do or depends on the kind of shopping?” Security concern was measured by asking respondents to what extent they agree with this statement: “I don’t like giving my credit card number or personal information online.” For the measure of convenience, the respondents indicated their level of agreement with this statement: “shopping online is convenient.” A four-point scale (1 = “strongly disagree” and 4 = “strongly agree”) was used for the measures of online security and convenience. It should be noted that single-item measures were used for these three attitudinal constructs. Though academics typically use multiple items to measure marketing constructs, a recent study by Bergkvist and Rossiter (2007) indicated that there is no empirical evidence showing that researchers are losing predictive power by using a single-item measure for objects that are simple and unambiguous (e.g., attitude toward an advertisement or a brand). Their finding further demonstrated that single-item measures have predictive power equivalent to multiple-item measures. Considering that these three attitudinal constructs are simple and easy to understand, it is appropriate to use a single-item measure.

In order to directly compare online stock traders and non-traders, chi-square tests were conducted for categorical measures (i.e., demographics, Internet usage, and shopping enjoyment) and the results are reported in Tables 1 and 2, while ANOVAs were performed for continuous measures (i.e., convenience and security) and the results are given in Table 3.

As can be seen in Table 1, compared to non-traders, online stock traders tend to be males and have greater education and higher income levels. Therefore, hypotheses 1, 3, and 4 were supported. The data did not show any significant difference in age between online stock traders and non-traders, so hypothesis 2 was rejected.

Table 2 shows how online stock traders and non-traders differ in terms of their Internet usage behaviors and shopping enjoyment. The results indicated that online stock traders are more likely to be frequently Internet users (i.e., daily) than non-traders. Therefore, hypothesis 5 was supported. Hypothesis 8 stated that online traders value shopping enjoyment more than non-traders. Results in Table 2, however, indicated that non-traders indeed enjoy shopping more than traders. Thus, hypothesis 8 was rejected. One possible explanation for this is that the majority of non-traders were females, who are more likely to be enjoyment seekers than males (Guiry, Magi, and Lutz, 2006), and that males accounted for 62.5% of online traders.

**Table 1: Demographics of Online Traders vs. Non-Traders**

	Traders (N=200)		Non-Traders (N=1479)		$\chi^2$ Statistic
	Frequency	Percent	Frequency	Percent	
Gender					$\chi^2 = 24.75$ $p < .001$
Male	125	62.5	666	45.0	
Female	75	37.5	813	55.0	
Age					$\chi^2 = 3.20$ $p = .362$
18-29	29	15.2	269	18.7	
30-49	75	39.3	511	35.6	
50-64	64	33.5	446	31.1	
65+	23	12.0	210	14.6	
Education					$\chi^2 = 48.74$ $p < .001$
Some School	4	2.0	66	4.1	
High School Graduate	33	16.7	442	30.1	
Some College	43	21.7	415	28.2	
College Graduate	58	29.3	321	21.9	
Post-Graduate	60	30.3	230	15.7	
Income					$\chi^2 = 41.86$ $p < .001$
Less than \$20,000	8	5.0	127	10.8	
\$20,000 to under \$40,000	26	16.1	250	21.4	
\$40,000 to under \$60,000	22	13.7	266	22.7	
\$60,000 to under \$100,000	45	27.9	307	26.2	
\$100,000 or more	60	37.3	221	18.9	

**Table 2: Internet Usage Behavior of Online Traders vs. Non-Traders**

	Traders (N=200)		Non-Traders (N=1479)		$\chi^2$ Statistic
	Frequency	Percent	Frequency	Percent	
Internet Usage					$\chi^2 = 42.99$ $p < .001$
Daily	176	88.0	979	66.2	
Several Times a Week	19	9.5	338	22.9	
Less Often	5	2.5	161	10.9	
Shopping Enjoyment					$\chi^2 = 7.60$ $p = .022$
Enjoy Shopping	69	35.0	633	43.4	
Just something I have to do	105	53.3	709	48.7	
Depends on the kind of shopping	23	11.7	115	7.9	

**Table 3: Attitudes toward the Internet – Convenience and Security Concern**

	Convenience			Security Concern		
	Sample	Mean	Std. Dev.	Sample	Mean	Std. Dev.
Traders	N = 165	3.11	.48	N = 187	2.96	.61
Non-traders	N = 1173	2.90	.52	N = 1406	3.18	.61
F Statistic	$F = 25.20$ $p < .001$			$F = 21.98$ $p < .001$		

The results in Table 3 indicate that online stock traders value the convenience of online shopping more than non-traders (mean, 3.11 vs. 2.90), and they are also less concerned about the online security than non-traders (mean, 2.96 vs. 3.18). Both results are statistically significant at the 0.001 level. Therefore, hypotheses 6 and 7 were supported.

#### 4. Conclusions, Discussions, and Future Directions

This study compares online stock traders and non-traders based on their demographics, Internet usage behaviors, and attitudes toward the Internet. The results indicate that significant differences exist in those areas. Specifically, online stock traders tend to be males, be frequent Internet users, have greater education, and have higher incomes than non-traders. However, no age differences were found in this study. Compared to non-traders, online stock traders were more likely to be convenience seekers and less likely to be enjoyment seekers. Finally, online stock traders were less concerned about online security than non-traders.

The findings of this study certainly advance our knowledge about online stock trading. Numerous studies have shown how individual characteristics such as demographics and attitudes can be significant drivers of behavior (Brashear et al., 2009, Gefen, 2000, and Hallahan, Faff, and McKenzie, 2003). This study extends that growing body of research by indicating how individual differences can be important predictors of online stock trading behavior. Results from this study also have important implications for businesses who intend to attract potential investors to their online trading channels. By realizing how online traders differ from non-traders, businesses can tailor their online trading channel design in order to meet customer needs. For example, considering that convenience drives online stock trading, businesses such as online brokerages can design their web trading page in a way that facilitates the trading process.

Future research may expand the current study to include more factors such as cultures and motivations. Cultures have been shown to affect many aspects of consumer behavior. For example, consumers with different cultural backgrounds may have different levels of risk tolerance. As indicated by Zhou, Su, and Bao (2002), Americans are more likely to be risk seekers, while Chinese tend to be risk averse. It would be interesting to conduct a cross-cultural study so as to enhance our understanding of whether individual differences hold true across cultures in the area of online stock trading.

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