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CUSTOMERS' USE OF ELECTRONIC COMMERCE IN STOCK TRADING AND EFFECTS ON RELATIONSHIP OUTCOMES

By

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ABSTRACT

CUSTOMERS' USE OF ELECTRONIC COMMERCE IN STOCK TRADING AND EFFECTS ON RELATIONSHIP OUTCOMES

By

Seongcheol Kim

In recognizing the significance of linking the power of electronic commerce to relationship marketing in continuously provided service context, this dissertation investigates the role of electronic commerce in determining desirable customer relationship outcomes. In particular, this dissertation proposes the positive associations between customers' use of electronic commerce in stock trading and four customer relationship outcomes such as perceived service quality, overall satisfaction, attitudinal loyalty, and actual retention. In addition, in order to control for other factors that could make electronic commerce useful, this dissertation also examines several conditions under which customers use electronic stock trading more.

Empirical data were collected from an intercept field survey of 170 customers of two major Korean stock trading brokers. Our results show that customer knowledge, price sensitivity, access capacity, and frequency of order are crucial conditions for customers' use of electronic commerce in stock trading. Moreover, customer knowledge and price sensitivity appear to predict use of electronic commerce most significantly, controlling some demographic variables. Our main findings from a series of hierarchical regression analyses indicate that use of electronic commerce in stock trading is strongly associated with high

levels of service quality, overall satisfaction, attitudinal loyalty, and actual retention. In addition, the existence of offline experience is negatively related to the level of overall satisfaction and attitudinal loyalty. Interestingly, the greater use of the Internet appears to be associated with lower level of service quality.

Partially consistent with the results of regression analyses, the results of a structural equation analysis confirm only two of four direct linkages between use of electronic commerce and relationship outcomes: 1) use of electronic commerce and service quality, and 2) use of electronic commerce and actual retention. Service quality turns out to play a significant mediating role in predicting the impacts of use of electronic commerce on overall satisfaction and customers' actual retention. Overall satisfaction also appears to play a mediating role with service quality in predicting the impacts of use of electronic commerce on customers' attitudinal loyalty.

Despite several limitations, including cross-sectional design conducted only in Korea, this study advances the understanding of the powerful role of electronic commerce in creating some desirable customer relationship outcomes. The limitations of this study suggest that the strengths of the findings will be enhanced through future longitudinal research efforts replicated under different cultures with larger sample. At the practical level, findings in this study mainly suggest that the service providers really need to shift a transaction orientation to relationship building in their efforts on electronic commerce and utilize electronic commerce arrangements as a strategic vehicle of relationship marketing as well as a simple driver of cost savings.

This dissertation is dedicated to my beloved mother who has prayed for me even in her fight against a brain tumor during my absence.

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

Importance of Customer Relationship

For many years, continuously provided service providers such as financial

service and telecommunication firms have focused on infrastructure operation or

product/service innovation rather than customer relationship management (Hagel

& Singer, 1999). However, as competition has become more intense, many

business organizations have realized that the customer is the foundation of the

business and keeps it in existence (Cook, 1997; Timm, 1998; Bowen &

Schneider, 1999). In particular, in the financial service sector where customer

acquisition costs are significantly higher than retention costs (Ennew & Binks,

1996), an organization's ability to remain in business and produce superior

organizational performance is becoming a function of its competitiveness and its

ability to win customers from the competition and retain them (Appiah-Adu, 1999;

Ozment & Keller, 1999; Pritchard et al., 1999; Vandermerwe, 1999; Woo & Fock,

1999).

The growing interest in the building and maintenance of strong customer

relationship is primary concern for continuously provided service providers for

several reasons. First of all, some business analysts have suggested that the

cost of recruiting a new customer is five times more than the cost of retaining an

existing customer (Holmlund & Kock, 1996; Ennew & Binks, 1996; Davis, 1997;

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Mittal & Lassar, 1998; Kotler, 1999; Krishnan et al., 1999; Zeithaml, 2000). Doing business with existing customers saves money on a variety of acquisition costs associated with advertising, personal selling pitch to new prospects, setting up new accounts, explaining business procedures to new customers, and inefficient dealings during the customer's learning process (Stewart, 1996; Mittal & Lassar, 1998; Parthasarathy & Bhattacherjee, 1998). Furthermore, loyal existing customers are likely cost less to service because costs can be amortized over a longer customer lifetime (Gwinner et al., 1998; Zeithaml, 2000). Second, existing loyal customers profit a company more than by saving on costs. Loyal customers can lead to increased revenues for a company, result in predictable sales and profit streams, and are more likely to purchase additional goods and services or pay more for them (Rust & Zahorik, 1993; Gwinner et al., 1998). In addition, they often generate referrals for a company via word-of-mouth recommendations (Appiah-Adu, 1999; Methlie & Nysveen, 1999). For example, they may share their experience with their family and friends, encouraging them to try the service (Chen-Yu et al., 1999). In fact, Reichheld (1996) showed that the longer a customer stay with a company, the more the customer is worth. He found that reducing customer defections by as little as five points – from fifteen to ten percent - can double profits.

Since existing customer base has the superior financial value over new customers, it is understandable that a greater emphasis is being placed on relationship marketing or defensive marketing strategies which are new business approaches focused on building and maintaining long-term and highly integrated

relationships with customers (Parker & Funkhouser, 1997; Rylander et al., 1997; Gordon, 1998; Dubé & Maute, 1998).

Role of Electronic Commerce

According to Kalakota and Whinston (1997), the importance of attracting, pleasing, and keeping customers is as old as the notion of marketing itself. What is new is the use of technology for the active management of a firm's current customer base as a strategic asset. Gordon (1998) also recognizes the role of information technology for relationship marketing by arguing that relationship marketing and its key components, including mass customization, is simply not possible without the enabling effects of technology to store, retrieve, process, communicate and analyze customer data.

As a matter of fact, information technology has always played a role in attracting and keeping customers (Duncan & Moriarty, 1998) and in shaping firm-customer interaction (Wayland & Cole, 1997; Bitner et al., 2000; Parasuraman & Grewal, 2000). Over the last decade, information technology has been adopted to create, enhance and transform customer relationships (Gordon, 1998) and has aided firms in forming, enhancing and even terminating relationships with customers (Davis, 1997). Information technology has really revolutionized the concept of delivering services and redefined the customer interface (Jones & Sasser, 1995; Roth & Jackson, 1995; Heskett et al., 1997). Thus, in all businesses – from a relatively slow-moving business to rapidly changing businesses – the information technology infrastructure has become critical asset

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to create superior linkage or interface with customers (Prahalad & Krishnan, 1999). For example, in the information intensive banking industry, information technology plays an increasingly significant role. Information technology was primarily employed to automate the back-office of banks in the 1960s. This situation had been changed by a move of information technology into the front office and thus the beginning of management information systems. This extension has made the banking industry enter a new era, where the customer is integrated with the technology of the firm (Liao et al., 1999).

Recently, use of electronic commerce as a means of enacting transactions and relationships with customers is increasing exponentially (Hoffman & Novak, 1996; Davis et al., 1999). Since inherent opportunities of electronic commerce for conducting business online are driving the development of a new customer relationship paradigm, development of new products and pursuit of low cost 'self-service' strategies (Costello & Tuchen, 1998; Dunn & Varano, 1999), most organizations, large and small, are making major electronic commerce-related investments (Berthon et al., 1999).

In particular, the development of the Internet has made it possible for service providers to deliver service directly through the Internet with little or no human intervention (Voss, 2000). Thanks largely to the Internet a lot of service companies employ the new electronic channels (Ghosh, 1998; Prahalad & Ramaswamy, 2000). The Internet offers a primary communications channel with customers (Hoffman et al., 1996; Peterson et al., 1997; Evan & Wurster, 1999), a whole new way to establish rapport or direct link with customers (Sterne, 1996;

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Chou & Chou, 2000), and benefits that can help customers be more efficient and effective in their interactions with companies (McGaughey & Mason, 1998). The Internet has made it possible for companies to focus on building relationships with individual customers and to make direct, intimate and personalized contact with each customer (Dutta & Segev,1999; Prahalad & Krishnan, 1999; Walsh & Godfrey, 2000). The World Wide Web (WWW) provides companies with a powerful means to interact with its customers on one-to-one basis (Hoffman et al., 1996; Vessen, 1998; Wells et al., 1999) and presents important business opportunities (Dunn & Varano, 1999). Thus many organizations are leveraging the World Wide Web to create superior linkages with customers (Venkatraman & Henderson, 1998).

Goals and Organization of Dissertation

In recognizing the significance of electronic commerce, a lot of previous studies have concentrated mainly on the adoption of this new technological innovation in the context of business-to-business transactions or one-time business-to-consumer interactions. However, little academic research has investigated electronic commerce in the context of continuously provided service where the customer typically enters into a formal relationship with the service provider and, subsequently, consumes or uses the service (continuously or intermittently) for an extended time period. In addition, there has been little research focusing on the subsequent outcomes or post-adoption consequences of electronic commerce. Moreover, in spite of the importance of relationship

marketing, there is little research linking the use of electronic commerce to the customer relationship outcomes.

The goal of this dissertation is to examine explicitly the effects that customers' use of electronic commerce in stock trading service context on key customer relationship outcomes such as perceived service quality, overall satisfaction, attitudinal loyalty and actual retention. In addition, in order to control for other factors that could make electronic commerce useful, this dissertation also examine several conditions under which customers use electronic stock trading more.

The relevance of examining these conditions and effects in stock trading context is apparent. First, electronic commerce is causing fundamental changes in stock trading market where the value of the products offered is shaped by the channel of delivery. In addition, the dynamic nature of customer relationships is especially important in this competitive market (Parthasarathy & Bhattacherjee, 1998; Bolton & Lemon, 1999).

Several research questions can be summarized as follows.

1) *What are the conditions influencing the increased use of electronic commerce in stock trading?*

2) *What effects does use of electronic commerce in stock trading have on each of customer relationship outcomes such as perceived service quality, overall satisfaction, attitudinal loyalty and actual retention? Is there any significant*

difference between electronic traders and non-electronic traders in those

relationship outcomes?

3) What are the dynamic relationships among customer relationship outcomes?

How are the effects of use of electronic commerce in stock trading mediated

by service quality-overall satisfaction-customer loyalty links?

This dissertation is expected to contribute to electronic commerce and information technology research as well as marketing research as follows. First, this dissertation would examine the power of electronic commerce to create some desirable customer relationship outcomes for continuously provided service providers. Since most firms today face great pressure to maximize the benefits from their investments in electronic commerce, it should be helpful to provide a framework to assess the role of IT (information technology) enabled electronic commerce in terms of customer relationship outcomes for continuously provided service providers, in particular stock brokerage firms. Second, this dissertation may emphasize the need for firms to utilize electronic commerce implementation as not only a simple driver of cost savings but also a vehicle of defensive marketing strategies.

This dissertation is organized into six chapters. Chapter one introduces the importance of customer relationship and the role of electronic commerce. Chapter two reviews the previous theoretical and empirical literature on conditions for use of electronic commerce and impacts of electronic commerce on customer relationship outcomes. Chapter three describes the methods and

procedures of this study. Chapter four presents the results of this study. Chapter five discusses the findings in detail. Chapter six presents the summary and conclusions with the limitations and implications of this study. The appendix includes informed consent form and the survey instrument. The references for this study are presented at the end of this dissertation.

CHAPTER 2

REVIEW OF THEORETICAL AND EMPIRICAL LITERATURE

Conditions for Use of Electronic Commerce

The main focus of this research is to understand how use of electronic

commerce impacts on customer relationship outcomes in continuously provided

service context, in particular stock trading industry. However, to examine the

influences of electronic commerce, it is necessary to control for other factors that

could make electronic commerce useful (Kraut et al., 1999). Thus it is important

to examine the conditions under which customers use electronic commerce

more.

Whereas breakthroughs in electronic commerce have led to wide

acceptance by customers, customers differ in how and how often they use

electronic commerce (Barczak et al., 1997). Why do customers differ in their

usage of new information technologies such as electronic commerce? This

problem has persisted in the information systems literature for several decades

within various contexts and with diverse variables tailored to the specificity of

information technologies (Agarwal & Prasad, 1998). As a matter of fact, most

previous research had emphasized the use of individual difference variables as

critical factors that influence user acceptance of new systems and, hence, the

actual use of these systems.

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First of all, personal innovativeness may be associated with customers' use of electronic commerce. Rogers (1995) defined innovativeness in terms of the degree to which a person is relatively earlier in adopting an innovation than other members of his or her social system. Parthasarathy and Bhattacherjee (1998) defined the notion of innovativeness as the degree to which an individual is receptive to new ideas and makes innovation decision independently of the communicated experience of others. In addition, Steenkamp, Hofstede and Wedel (1999) defined consumer innovativeness as the predisposition to buy new and different products and brands rather than remain with previous choices and consumption patterns. Considering these definitions, Lin and Jeffres (1998) developed the measure assessing innovativeness traits associated with new communication technologies and found that the intent to keep up with the technology was a strong predictor for interest in adoption and use of multimedia cable technology. Agarwal and Prasad (1998) also developed a specific scale assessing personal innovativeness in the domain of information technology (PIIT) and validated the construct in the context of the innovation represented by the World Wide Web (WWW). Therefore, we may expect that customers would be willing to use electronic commerce more when they have personal innovativeness relevant to information technology usage.

Second, according to Li, Kuo and Russell (1999), actual use of electronic commerce requires knowledge about the Internet or "Internet literacy." Konana et al. (2000) also argue that investors' knowledge of the stock market and trading as well as knowledge of the Internet is crucial in the online setting. Sharma and

Bingi (2000) confirmed this argument by stating that online investors tend to make the decisions based on independent research rather than relying on a broker's advice, whereas traditional investors are individuals who need constant advise and "hand holding." Therefore, we may expect that customers would use electronic commerce in stock trading more when they have enough knowledge of electronic channel, stock market and stock transaction itself.

Buzzell and Ortmeyer (1995) acknowledged that just-in-time communication technologies help lower costs and improve service to the customer. Tax and Brown (1998) also found that deploying technology has lowered the cost of complaining and enhanced customer perceptions of a firm's responsiveness. Based on transaction cost theories, Bakos (1998) argues that Internet-based electronic marketplaces leverage information technology to match buyers and sellers with increased effectiveness and lower transaction costs, leading to more efficient, friction-free markets. The virtual value chain theory also suggests that electronic commerce reduce transaction costs and lowers product pricing (Benjamin & Wigand, 1995). These developments are commonly attributed to the efficiency of friction-free electronic markets that lower transaction and information processing costs by reducing human intermediation (Konana et al., 2000). In fact, electronic stock trading has dramatically reduced the direct transaction costs including brokerage commission. For example, unlike the U.S. system in which the brokers charge a fixed amount per trade, the stock brokerage commission is determined in proportion to the transaction amount in Korea. Moreover, as expected, the commission rate for electronic trading is only

one-third or one-fourth of the commission rate for offline trading (see Table 3).

Thus we expect that service price-sensitive customers are likely to use electronic

commerce in stock trading in order to enjoy the lower commission.

In the meantime, actual behavior of a person may be dependent on the

interaction that occurs between that person and his/her situational environment.

Previous research has demonstrated that the situational variables such as time

pressure may influence a consumer's conduct and attitude. Linneman et al.

(1995) studied the effect of time pressure on the use of home shopping and

concluded that significant and growing numbers of time pressured consumers

were prepared to do their food shopping from home. Barczak et al. (1997) also

found that individuals might use online grocery shopping because of lacking time

to visit the store. According to Kenhove and Wulf (2000), many consumers are

becoming more concerned about the efficiency of their shopping patterns

because of time pressure, and efficiency can refer to the use of home shopping.

Therefore, we may expect that customers would use electronic commerce more

when they perceive time pressure or have little discretionary time.

In addition to time pressure, social pressure may influence individual

behavior. In a study of microcomputer usage, Igbaria (1993) argued that social

norms had a significant effect on the extent of technology usage. Rogers (1995)

also suggests that an important motivation for any individual to adopt an

innovation is the desire to gain social status. Individuals may use new information

technologies for obtaining a higher social status or a more important position in

their society. In their cross-cultural study on cellular phone usage, Kwon and

Chidambaram (1998) found that users were motivated to use information technology more from social pressure including peer pressure and concern for social status and current trends. Thus we may expect that customers would use electronic commerce more when they are under greater social pressure.

The capacity or speed to access to electronic channels including the Internet may be another situational condition for influencing use of electronic commerce. Hoag (1996) studied the relationship between access capacity and media use and indicated that users with high-speed access are more likely to spend time online, use more parts of the Internet, and tend to be more frequent users of data-intense applications. In support of her study, Emmanouilides and Hammond (2000) found that those users with a high data transfer speed were more likely to be active users of the Internet. Therefore, we may expect that customers would use electronic commerce in stock trading more when they have high-speed access to the electronic networks.

Finally, besides personal and situational conditions, transaction characteristics such as transaction frequency and volume may be associated with customers' use of electronic commerce in stock trading. When customers are involved in many transactions frequently and they have a sufficient volume of transactions, electronic commerce would be more effective and convenient way for them to handle those transactions.

Hypothesis 1: In summary, we expect that customers would use electronic commerce more in stock trading, when they

a) have greater personal innovativeness in the domain of information technology

b) have greater knowledge of electronic channel and stock market

c) are concerned about price for stock trading service

d) are under greater time pressure

e) are under greater social pressure

f) have higher access capacity

g) place more orders in a week

h) have greater value of investment in stocks

According to Kenhove and Wulf (2000), the motivations, intentions, and actual behavior of a person are dependent on the interaction that occurs between that person and his/her situational environments. Considering this possible interaction, it is expected that key situational factors such as time pressure and social pressure not only have a direct effect on use of electronic commerce in stock trading but also moderate the effect of personal factors on use of electronic commerce. Moreover, it is also expected that key situational factors moderate the effect of transaction characteristics on use of electronic commerce. Thus we assume the effects of the interactions between personal factors and situational factors as well as between transaction characteristics and situational factors on use of electronic commerce in stock trading.

Hypothesis 2: The higher the level of time pressure, the stronger the positive association between

a) *personal innovativeness and use of electronic commerce in stock trading*

b) *customer knowledge and use of electronic commerce in stock trading*

c) *price sensitivity and use of electronic commerce in stock trading*

d) *frequency of order and use of electronic commerce in stock trading*

e) *transaction volume and use of electronic commerce in stock trading*

The higher the level of social pressure, the stronger the positive association between

f) *personal innovativeness and use of electronic commerce in stock trading*

g) *customer knowledge and use of electronic commerce in stock trading*

h) *price sensitivity and use of electronic commerce in stock trading*

i) *frequency of order and use of electronic commerce in stock trading*

j) *transaction volume and use of electronic commerce in stock trading*

Impacts of Use of Electronic Commerce

The relevant stream of research in marketing has examined the impact of specific marketing efforts on perceptual dependent variables such as perceived service quality, overall satisfaction, attitudinal loyalty and actual retention (Zeithaml, 2000). These customer relationship outcomes have been the focus of relationship marketing theory and practice since delivering high quality service and having satisfied and loyal customers are viewed as indispensable for gaining

a sustainable advantage (Shemwell et al., 1998).

Recently, as electronic commerce proliferates, all organizations, large and small, are making major electronic commerce-related investment decisions to stay in business and be competitive (Berthon et al., 1999). Electronic commerce investments are expected to improve the execution of business transactions over various electronic networks. These improvements may result in greater economic efficiency such as lower costs, and more rapid exchange (Kalakota & Whinston, 1997). In the meantime, according to Coulter and Ligas (2000), new technological improvements such as electronic commerce can play important roles in how customers view service relationship. Thus electronic commerce investments are also expected to result in enhanced service quality and customer satisfaction but, ultimately, these two success factors are likely to lead to customer loyalty (Appiah-Adu, 1999; Krishnan et al., 1999).

Given the importance of customer relationship outcomes to service businesses and the recent development of electronic commerce, a critical research agenda that requires attention is whether there is a significant link between electronic commerce-related investments and customer relationship outcomes (Appiah-Adu, 1999). A better understanding of the relationship between electronic commerce and customer relationship outcomes may provide service firms with information to decide the future of electronic commerce arrangements.

This research assesses the importance of electronic commerce as a strategic driver of customer relationship outcomes for a continuously provided

service firm, in particular stock brokerage firm. This part explains the underlying

processes through which customers' use of electronic commerce in stock trading

leads to improvements in service quality and higher levels of overall satisfaction,

and ultimately to such desired outcomes as attitudinal loyalty and actual

behavioral retention.

Impacts on Service Quality

Measure of service quality has become a widely used barometer of

business performance over the past decade. It is because that this is indicator of

other critical measures of business performance such as customer satisfaction

and loyalty, profit, market share, and growth (Rust & Zahorik, 1993).

Service quality issues can be spilt into technical quality and functional

quality (Grönroos, 1984 & 1990; Parasuraman et al., 1985; Lovelock, 1996; Mittal

& Lassar, 1998; Sharma & Patterson, 1999). Technical quality is the quality of

what is delivered and functional quality is the quality of how the service is

delivered. The technical dimension refers to what the customer receives, or what

he has left after the interaction is over. The functional dimension refers to how

the service is received, or social fit, systems, atmosphere and so on (Holmlund &

Kock, 1996). Similarly, Stank et al. (1999) suggest that service quality consist of

two dimensions including quality relative to operational elements and quality

relative to relational elements. Operational elements are those activities

performed by service providers that contribute to product availability, product

condition, delivery reliability, and delivery speed, consistent quality, productivity

and efficiency. Relational quality that went beyond core capabilities focuses on those activities that enhance service firms' closeness to customers - frequent communications, willingness to special deliver in emergencies, accommodation of special requests, and friendly and knowledgeable staff (Stank et al., 1999). They also differentiate between the quality associated with the process of service delivery and the quality associated with the outcome of the service (Lehtinen & Lehtinen, 1991). Therefore, it is usual to distinguish between the outcome of the service (technical quality) and the process by which the service delivered (functional quality) in the service sector (Ennew & Binks, 1996).

As explained above, technical quality relates to actual outcomes or the core service as perceived by the customer (Lovelock, 1996). Since electronic commerce means the systematic elimination of time, space and form barriers (Costello & Tuchen, 1998), it may result in more effective performance such as better quality, greater customer satisfaction, and better corporate decision-making (Kalakota & Whinston, 1997). The real value of electronic commerce is that it allows a company to provide customers with a range of actual benefits including convenience, information, and interactivity (Ghosh, 1998). According to Roth and Jackson (1995), technology leadership in services firms is a significant variable that enhances organizational knowledge and improves overall service quality in the eye of the customer. Bitner and his colleagues (2000) argue that customers may improve the efficiency and effectiveness of their own service encounter experience through effective use of information technology across service encounters. Since electronic commerce may offer timeliness of

transaction execution, wide product range, ease of use, value-added services, quality of research, lower commission rates (Konana et al., 2000), we expect that use of electronic commerce in stock trading would enhance the customers' perception of technical dimension of service quality.

Quality evaluations are not made solely on the outcome of a service; they also involve evaluations of the process or manner of service delivery (Parasuraman et al., 1985). Roth and Jackson (1995) empirically examined that the quality of customer interface positively influences service quality in the banking industry. Since functional quality is concerned with the interaction between the provider and customer, it may be more affected by the use of electronic commerce. One of key benefits of implementing electronic commerce into the delivery of services is the ability to customize (Bitner et al., 2000). Electronic commerce allows customers to remotely experience products and services, actively participate in dynamic customization, and create mutually enforcing customer communities (Venkatraman & Henderson, 1998; Zott et al., 2000). In particular, Internet-based electronic commerce provides organizations with a powerful means to interact with its customers on one-to-one basis (Wells et al., 1999) and make direct and personalized contact with each customer (Dutta & Segev, 1999; Prahalad & Ramaswamy, 2000), and a personal feeling to the interface (Chou & Chou, 2000). In addition, the ability of electronic commerce to carry out an immediate and constant dialogue for 24 hours, 7 days a week is an integral part of the personalization process (Griffith & Krampf, 1998; Walsh & Godfrey, 2000). Furthermore, since electronic commerce enables customers to

participate in more active relationship with service provider or other customers, we expect that use of electronic commerce in stock trading would also enhance the customers' perception of functional dimension of service quality. The argument above leads to the following hypothesis.

Hypothesis 3: Customers' use of electronic commerce in stock trading is positively associated with their perceived service quality.

In addition, it is expected that conditions for use of electronic commerce in stock trading may moderate the effect of use of electronic commerce in stock trading on service quality. Thus we assume the effects of the interactions between conditions for use and use of electronic commerce in stock trading on service quality.

Hypothesis 4: The higher level of a) personal innovativeness, b) customer knowledge, c) price sensitivity, d) time pressure, e) social pressure, f) access capacity, g) frequency of order, and h) transaction volume, the stronger the positive association between use of electronic commerce in stock trading and perceived service quality.

Impacts on Overall Satisfaction

Overall customer satisfaction has long been a subject of research in consumer psychology. Customer satisfaction is often seen as the key to a

company's success and long-term competitiveness. In the context of relationship marketing, customer satisfaction is often viewed as a central determinant of customer retention (Hennig-Thurau & Klee, 1997; Szymanski & Hise, 2000). Rust and Zahorik (1993) defined satisfaction as a summary affective evaluation of a relationship experience. Selnes (1993) defined customer satisfaction as a post-choice evaluation of a specific transaction. In particular, overall satisfaction was defined as an overall evaluation based on the total purchase and consumption experience with a good or service over time (Anderson et al., 1994). A more comprehensive definition was provided by Oliver (1997), who defined satisfaction as the consumer's fulfillment response. Satisfaction was also defined as a judgment that a product or service feature, or the service itself, provided a pleasurable level of consumption-related fulfillment, including levels of under- or over-fulfillment (Woo & Fock, 1999). According to Garbarino and Johnson (1999), rather than capturing the transient and encounter-specific evaluations and emotions, applied market research tends to measure customer satisfaction as the consumer's general level of satisfaction based on all experiences with the firm.

Greater interaction between the service provider and the customer generally enhances satisfaction with the service experience (Zeithaml et al., 1988). An exploratory analysis by Ennew and Binks (1999) suggests that participation have a positive impact on customer satisfaction. Since electronic commerce offer both greater interaction and participation, companies employ it to improve overall customer satisfaction (Kalakota & Whinston, 1997). According to

Strader and Shaw (1997), electronic commerce enables a wide range of new seller and customer relationships to be set up, for instance increased and customized product information, customer participation in product development and reduction in order fulfillment time. All this may improve customers' overall satisfaction. Krishnan et al. (1999) also found that new channels of delivery such as information technology enabled call centers and the Internet are important in determining overall satisfaction. Thus, we expect that use of electronic commerce in stock trading would enhance the customers' overall satisfaction with their stock brokerage firm.

Hypothesis 5: Customers' use of electronic commerce in stock trading is positively associated with their perceived overall satisfaction with their stock brokerage firm.

In addition, it is expected that conditions for use of electronic commerce in stock trading may moderate the effect of use of electronic commerce in stock trading on overall satisfaction. Thus we assume the effects of the interactions between conditions for use and use of electronic commerce in stock trading on overall satisfaction.

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Hypothesis 6: The higher level of a) personal innovativeness, b) customer knowledge, c) price sensitivity, d) time pressure, e) social pressure, f) access capacity, g) frequency of order, and h) transaction volume, the stronger the positive association between use of electronic commerce in stock trading and perceived overall satisfaction.

Impacts on Loyalty

Many definitions of loyalty have been presented in the literature. Loyalty has been defined as a long-term commitment to repurchase involving both repeated patronage and a favorable attitude (Dick & Basu, 1994). Oliver (1997) defined customers' loyalty as a deeply held commitment to rebuy or repatronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior. Ellinger et al. (1999) analyzed the two dimensions of customer loyalty – repurchase intentions (repeat patronage) and commitment to the relationship (favorable attitude). However, customer loyalty is generally defined in service contexts as continued patronage of the same provider based on dedication or pragmatic constraints (Bendapudi & Berry, 1997). Loyalty is conceptualized as a behavioral intention to maintain an ongoing relationship with a service provider (Singh & Sirdeshmukh, 2000). Customer loyalty includes the willingness to recommend the company (Parasuraman et al., 1988; Zeithaml et al., 1996) and intention to buy additional lines of service or product from the company. In the meantime, these attitudinal definitions of customer loyalty can be supplemented

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with the concept of the behavioral dimension of loyalty such as actual retention behavior (Dick & Basu, 1994; Ruyter et al., 1998).

Most previous research in the domain of relationship marketing has focused on the antecedents of loyalty (Sharma & Patterson, 1999) because customer loyalty is increasingly being recognized by businesses as a path to long-term business profitability.

According to Walsh and Godfrey (2000), electronic commerce provider develops a relationship with the customer to build customer loyalty through accessibility, relevancy and constant dialogue with him. It may be possible for a company to build and nurture relationships with customers and thus claim their loyalty by engaging in electronic commerce efforts (Kalakota & Whinston, 1997). The result of interactive relationships through electronic commerce may be a higher retention of customers (Duncan & Moriarty, 1998). This is the process of 'locking' customers 'in'. Lock-in is achieved largely because new interactive technologies enable offerings to be more proactive and precise as service providers can obtain more and more knowledge about the customers in terms of their needs, likes, dislikes, and habits. This 'lock-in', which means the provider becomes the customer's first dominant or sole choice, builds the prospects for huge growth potential (Vandermerwe, 1999). Thus, we expect that use of electronic commerce in stock trading would enhance the customers' loyalty in terms of not only attitudinal loyalty but also actual behavioral retention.

Hypothesis 7: Customers' use of electronic commerce in stock trading is positively associated with their attitudinal loyalty.

Hypothesis 8: Customers' use of electronic commerce in stock trading is positively associated with their actual behavioral retention.

In addition, it is expected that conditions for use of electronic commerce in stock trading may moderate the effect of use of electronic commerce in stock trading on attitudinal loyalty and actual retention. Thus we assume the effects of the interactions between conditions for use and use of electronic commerce in stock trading on attitudinal loyalty and actual retention.

Hypothesis 9: The higher level of a) personal innovativeness, b) customer knowledge, c) price sensitivity, d) time pressure, e) social pressure, f) access capacity, g) frequency of order, and h) transaction volume, the stronger the positive association between use of electronic commerce in stock trading and attitudinal loyalty.

Hypothesis 10: The higher level of a) personal innovativeness, b) customer knowledge, c) price sensitivity, d) time pressure, e) social pressure, f) access capacity, g) frequency of order, and h) transaction volume, the stronger the positive association between use of electronic commerce in stock trading and actual retention.

Impacts of Other Dimensions of Use

In addition to the simple extent of use of electronic commerce in stock trading, other dimensions of use of electronic trading may have an effect on customer relationship outcomes. For example, customers, who have been involved in stock trading through offline channels before they started to use electronic trading, tend to compare the previous experience in offline channels and that of new electronic channels (Leszczyc et al., 2000). Thus we may expect that customers with offline stock trading experience show higher relationship outcomes because it is easy for them to recognize the relative advantage of electronic commerce comparing with traditional ways of trading stocks. On the other hand, customers starting stock trading through electronic commerce are not subject to this comparison. This argument leads to the following hypothesis.

Hypothesis 11: Electronic traders who don't have any offline stock trading experience are more likely to have a lower level of a) service quality, b) overall satisfaction with their brokers, c) attitudinal loyalty, and d) actual behavioral retention than others.

In the meantime, among several means for doing electronic commerce, the Internet is becoming the most dominant infrastructure for electronic commerce in stock trading. Considering the potential of the Internet, we would expect that electronic customers using only the Internet have higher relationship outcomes than other customers using non-Internet channels.

Hypothesis 12: Electronic traders using only the Internet channel for stock trading are more likely to have a higher level of a) service quality, b) overall satisfaction with their brokers, c) attitudinal loyalty, and d) actual behavioral retention than others using non-Internet channels.

Dynamic Links among Relationship Outcomes

The dynamic relationships among service quality, customer satisfaction and customer behavior (loyalty, switching or repurchasing) constitutes the research area of particular interest (Athanassopoulos, 2000). The cumulative insights from previous studies support the general notion that service quality enhances customer satisfaction, which, in turn, contributes to customer loyalty (Parasuraman & Grewal, 2000). The quality-satisfaction-loyalty linkage is also consistent with Heskett, Sasser, and Schlesinger's work (1997) on the service-profit chain. In terms of retaining customers, previous research shows that service quality and overall service satisfaction can improve customers' intentions to stay with a firm (Keaveney, 1995).

Service Quality – Satisfaction

Service quality and customer satisfaction have been the focus of much marketing theory and practice. In today's competitive markets, delivering high quality service and having satisfied customers are viewed as indispensable for gaining a sustainable advantage. Previous research has suggested that service quality and customer satisfaction are distinct constructs (Oliver, 1997; Taylor &

Baker, 1994), and that there is a causal relationship between the two constructs (Spreng & Mackoy, 1996). In support of this causal relationship, Shemwell et al. (1998) showed that service quality has a strong direct effect on patient satisfaction. Recently Athanassopoulos (2000) attempted to assess the antecedent of customer satisfaction in the context of the emerging competitive financial market of Greece. The empirical results of the study have confirmed previous research contentions that customer satisfaction is a function of service quality.

Hypothesis 13: Customers' perceived service quality is positively associated with their overall satisfaction.

Service Quality – Loyalty

The service management literature suggests that service quality usually lead to stronger customer loyalty. Offering a superior service provides consumers with a reason for selecting and remaining with a particular provider (Ennew & Binks, 1996). Rust and Zahorik (1993) related service quality perceptions to customer loyalty in banking industry. Parasuraman et al. (1988) found a positive and significant relationship between customers' perceptions of service quality and loyalty including their willingness to recommend the company and their purchase intention. Boulding et al. (1993) also found a positive correlation between service quality and behavioral intention including saying positive things about a university and planing to contribute money to the class. In addition,

Zeithaml et al. (1996) offered strong empirical support for the notion that improving service quality could increase favorable behavioral intentions on the part of a customer and decrease unfavorable ones. Using data relating to banks in the UK, Ennew and Binks (1996) has provided preliminary evidence concerning the positive impact of aspects of functional and technical service quality on loyalty and retention. Another study showed that customer service is more important than perceived product value in determining customer loyalty (Leung et al., 1998).

Hypothesis 14a: Customers' perceived service quality is positively associated with their attitudinal loyalty.

Hypothesis 14b: Customers' perceived service quality is positively associated with their actual behavioral retention.

Satisfaction – Loyalty

Customer satisfaction is an important outcome for service operations and is one of the most viable means of influencing customer loyalty (Reichheld & Sasser, 1990; Anderson et al., 1994). Except in a few rare instances, complete customer satisfaction is the key to securing customer loyalty and generating superior long-term financial performance (Jones and Sasser, 1995).

Previous research suggests a strong linkage between customer satisfaction and customer loyalty. Woodside et al. (1989) found a significant association

between overall patient satisfaction and intent to choose a focal hospital again. Fornell (1992) found a significant relationship between customer satisfaction and increased loyalty of customers in a Swedish study. Hallowell (1996) documented that customer satisfaction is significantly related to customer loyalty in a bank setting and that loyalty is related to profitability. Ellinger et al. (1999) showed that highly satisfied customers are more loyal than less satisfied customers. Satisfying customers should therefore be of great importance to service providers in keeping their customers loyal (Methlie & Nysveen, 1999).

Hypothesis 15a: Customers' overall satisfaction is positively associated with their attitudinal loyalty.

Hypothesis 15b: Customers' overall satisfaction is positively associated with their actual behavioral retention.

Indirect Impacts of Use of Electronic Commerce

We assume that use of electronic commerce in stock trading will have a positive effect on each of four key relationship outcomes such as perceived service quality, overall satisfaction, attitudinal loyalty and actual retention. In the meantime, the literature review on the dynamic relationships among those outcomes suggest that service quality can be a more central constructs which mediates the effect of use of electronic commerce in stock trading on overall

satisfaction, attitudinal loyalty and actual retention. This leads to the following hypotheses:

Hypothesis 16a: The effect of use of electronic commerce in stock trading on overall satisfaction is mediated by service quality.

Hypothesis 16b: The effect of use of electronic commerce in stock trading on attitudinal loyalty is mediated by service quality.

Hypothesis 16c: The effect of use of electronic commerce in stock trading on actual behavioral retention is mediated by service quality.

The previous literature review also suggests that overall satisfaction, which is an antecedent of customer loyalty, can mediate the effect of use of electronic trading on attitudinal loyalty and actual retention. This leads to the following hypotheses:

Hypothesis 17a: The effect of use of electronic commerce in stock trading on attitudinal loyalty is mediated by overall satisfaction

Hypothesis 17b: The effect of use of electronic commerce in stock trading on actual behavioral retention is mediated by overall satisfaction.

As was discussed earlier, if use of electronic trading is the sole exogenous variable, its effect on customer loyalty outcomes can be mediated by the link between service quality and overall satisfaction. This leads to the following hypotheses:

Hypothesis 18a: The effect of use of electronic commerce in stock trading on attitudinal loyalty is mediated by service quality and overall satisfaction.

Hypothesis 18b: The effect of use of electronic commerce in stock trading on actual behavioral retention is mediated by service quality and overall satisfaction.

The proposed main research model for this study is presented in Figure 1. This main model is a hypothesized model composed with hypotheses H1 to H12. In addition, Figure 2 shows the proposed path model representing hypotheses H13 to H18.

Figure 1 - The Proposed Main Model for the Study
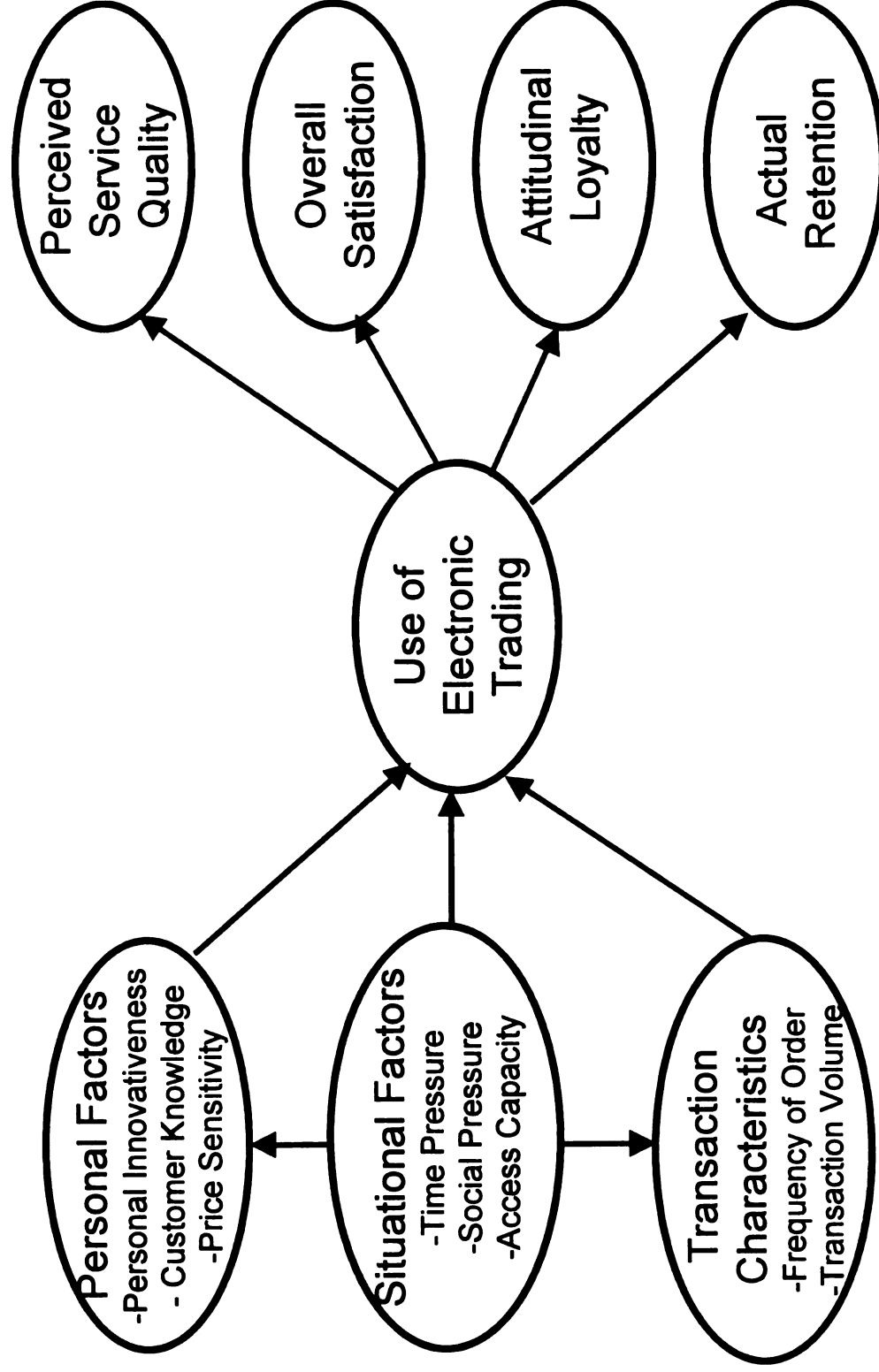
Figure 2 - The Proposed Path Model for the Study
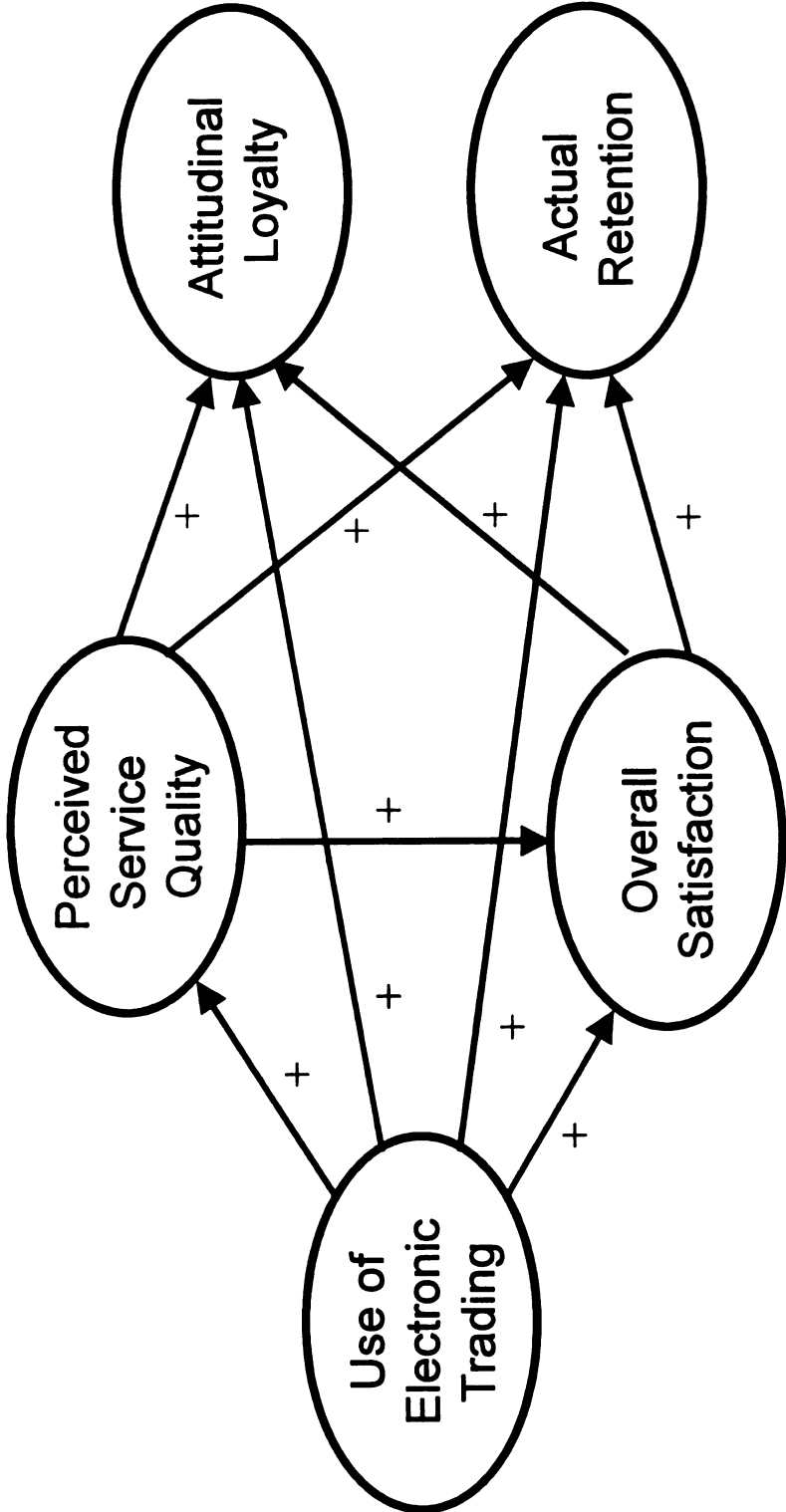
CHAPTER 3

METHODS AND PROCEDURES

The current chapter reports the research methods and procedures used in this study. Presentation in this chapter is organized under three major sections: measurement, research context and data collection.

Measurement

To address the research hypotheses described in the last chapter, multi-item indices to measure concepts related to personal innovativeness, customer knowledge, price sensitivity, service quality, overall satisfaction, and attitudinal loyalty were adopted from previous studies such as service marketing and innovation research. This is an attempt to minimize unanticipated problems associated with design and execution of measurement procedures. Some key measures including use of electronic trading and actual retention were specifically developed for this dissertation because there are few appropriate instruments in the previous empirical studies.

Measurement of most constructed variables in this study was executed by having respondents evaluate numerically a series of survey questions intended for the construction of Likert-type response scales. A five-point scale from strongly disagree (1) to strongly agree (5) indicates different levels of agreement with a question or statement. The validity of individual items was first examined

using principal components factor analyses. Items that loaded as expected were included in creating multi-items indices. According to the method of average ratings, scores on items written to measure the same construct are summed and then averaged to create composite measures. All multi-item composite measures were subjected to reliability analyses. Single-item measures were used when there was sufficient theoretical justification for including a construct.

The four sets of variables included in our analyses are described below:

Variables for Conditions of Use

In order to test the effects of use of electronic commerce in stock trading on relationship outcomes, we controlled for important conditions that enable or encourage individual investors to use electronic trading. These conditions included several personal factors, situational factors, and transaction characteristics. We reasoned that individual investors would depend on electronic trading more when they were personally innovative, when they knew well about stock trading and electronic channels, when they were sensitive to service price, when they were under time pressure and social pressure, when they had greater access capacity, when they ordered frequently, and when they had larger transaction volume.

Personal innovativeness

Personal innovativeness was defined in the domain of information technology as the willingness of an individual to try out any new information

technology. We used the construct developed and validated by Agarwal and Prasad (1998). This two-item index assessed personality traits relevant to customers' use of electronic trading (e.g., "Among my peers, I am usually the first to try out new information technologies.")

Customer knowledge

This two-item construct was operationalized as the respondents' knowledge about stock trading and electronic channels used for electronic stock trading.

Price sensitivity

Price sensitivity is a two-item construct measuring the extent to which the respondents were concerned about low prices for stock trading services. This measure was drawn from previous work (Degeratu et al., 2000).

Time pressure

This is the respondent's judgment of the extent to which stock trading was subject to time availability. We used only an item, which is one of the multi-item indices developed by Kraut and his colleagues (1999) and Kenhove and Wulf (2000), because their items cross-loaded and did not exhibit validity in this study.

Social pressure

This measure is the respondent's judgment of the extent to which the respondent used electronic trading because of motivation from his or her peers'

use. Since multiple items cross-loaded and did not exhibit validity and reliability, we used a single item measure developed by Kwon and Chidambaram (1998).

Access capacity

This five-point item was framed as statement about respondent's primary access capacity for electronic commerce in stock trading including: 1) 9600 bps or less; 2) 14400 bps; 3) 28800 – 33600 bps; 4) 56000 bps; 5) high speed (cable modem, ADSL or LAN).

Frequency of order

This five-point single item was framed as statement about how many orders the respondent makes in a week through his/her broker.

Transaction volume

This five-point single item was framed as statement about the total value of the respondent's current investments in stocks.

Variable for Use of Electronic Commerce In Stock Trading

Use of Electronic Trading

In order to measure actual use of electronic commerce in stock trading, the survey asked about the extent or degree to which stock transactions was made through electronic trading during last six months. This is a composite index with

two items, including: 1) portion of total number of orders that was made through electronic trading during last six months; and 2) portion of total $value of orders that was made through electronic trading during last six months. The portion was estimated by the percentage, which was stated on a five-point scale ranging from 1 to 5: 1) 1% to 20%; 2) 21% to 40%; 3) 41% to 60%; 4) 61% to 80%; and 5) 81% to 100%. It was because raw percentages needed to be collapsed into more managerial and interpretable number of scale categories. In addition, 0 was assigned to the cases that never used electronic trading.

Dummy Variables for Use of Electronic Trading

In order to differentiate for several types of electronic trading usage, two dummy variables were introduced. At first, *offline experience* is a dummy variable coded as 0 if the respondent has no offline stock trading experience and 1 otherwise, in other words the respondent is a previous or current offline trader.

In addition, *Internet usage*, the second dummy variable represents the respondent's dependence on the Internet for stock trading purpose. It is coded as 1 if the respondent uses only Internet channel and 0 otherwise.

Variables for Relationship Outcomes

In order to measure impacts of use of electronic trading on customer relationship outcomes, the survey asked respondents to evaluate the perceived levels of service quality, overall satisfaction and attitudinal loyalty at the time of survey. Besides, the survey asked about actual behavioral retention by asking

the extent to which stock transactions was made through the primary broker during last six months.

Service quality

Instead of using the classical twenty-two-item SERVQUAL instrument (Parasuraman et al., 1988) to measure service quality, a nine-item composite index representing two sub-dimensions such as technical quality and functional quality was originally developed. Each item consisting of the composite index was adopted from previous literature on perceived service quality (Parasuraman et al., 1985; Ennew & Binks, 1996; Tax et al., 1998; Ennew & Binks, 1999; Madden et al., 1999; Ozment & Keller, 1999; Athanassopoulos, 2000; Lee et al., 2000). After the first run of a factor analysis, three items were removed because they loaded a different factor significantly. These eliminated items include 1) customer education, 2) interactions among customers and 3) level of service commission. The remaining six items were examined again using a factor analysis and included in composing an index. The items measuring service quality includes 1) consistency and dependability; 2) timeliness; 3) reliability and accuracy; 4) accessibility; 5) responsiveness and 6) personalization and customization.

Overall satisfaction

This three-item composite index was operationaized based on previous literature focusing on customer satisfaction, in particular satisfaction with financial

service providers (Loh & Ong, 1998; Ellinger et al., 1999; Krishnan et al., 1999; Methlie & Nysveen, 1999). The index consists of three statements including 1) I feel that this broker manages my account in a good way; 2) I am delighted with my overall relationship with this broker; and 3) I wish more of my suppliers were like this broker.

Attitudinal Loyalty

To measure the respondent's attitudinal loyalty, a seven-item composite index, representing all of three sub-dimensions such as relationship commitment, willingness to recommend and willingness for one-stop shopping, was operationalized based on previous marketing literature (Jones & Sasser, 1995; Loh & Ong, 1998; Ellinger et al., 1999; Krishnan et al., 1999; Methlie & Nysveen, 1999; Pritchard et al., 1999; Price & Arnould, 1999). The items representing relationship commitment includes 1) commitment to continue the relationship with the broker; and 2) importance of maintaining a long-term relationship with the broker. To measure willingness to recommend, another aspect of the respondent's attitudinal loyalty, three items were adopted among widely used items for word-of-mouth study. This sub-dimension consists of 1) willingness to recommend the broker to someone who seeks advice; 2) willingness to say positive things about the broker to other people; and 3) willingness to gladly encourage friends and relatives to do business with the broker. To measure willingness for one-stop shopping, the third aspect of attitudinal loyalty, two more items were drawn from previous empirical works (Zeithaml et al., 1996; Ruyter et

al., 1998). This measure includes 1) willingness to consider the broker as the first choice in case of buying new financial service or product; and 2) willingness to do buy other financial services through the broker.

Actual retention

In order to measure the actual behavioral loyalty, the survey asked about the extent to which stock transactions was made through the respondent's primary broker during last six months. This is a composite index with two items, including: 1) portion of total number of orders that was made through the respondent's primary broker during last six months; and 2) portion of total $value of orders that was made through the respondent's primary broker during last six months. The portion was estimated by the percentage, which was stated on a five-point scale ranging from1 (1% to 20%) to 5 (81% to 100%).

Control Variables

It was noted that conclusions regarding differences in use of electronic trading and relationship outcome should not be confounded by differences in demographic variables. Thus we included some demographic variables in our analyses to hold the respondents' demographic differences constant. A dummy variable was used to represent each of the two genders. Female was coded as 0 and 1 was assigned to male. The other demographic variables were categorized on a five-point scale because these variables normally spread out in large ranges.

Research context: Korean Stock Trading Industry

Electronic commerce is causing fundamental changes in the stock trading market. Inherent opportunities of this innovative channel are driving the development of a new customer relationship, development of new products, pursuit of low cost 'self-service' strategies, and emergence of 'virtual brokers'.

Growth drivers of electronic stock trading

Globally, electronic stock trading is the fast-growing financial service and the situation in Korea is not different. The growing popularity of electronic stock trading services in Korea is attributable to several reasons.

First of all, as most electronic stock trading services are offered through the Internet, the surging number of Internet users is recognized as a key growth driver of electronic stock trading. The number of Internet users in Korea has surged over the last few years, reaching 15.34 million users as May 2000. Especially, the number of high-speed Internet users is estimated as 2.3 million and this number is increasing rapidly every day.

Second, in April 1997, the Securities and Exchange Act was amended, allowing electronic stock trading services in Korea. Moreover, after the financial crisis in late 1997, the Korean government has deregulated a variety of restrictive securities transaction practices to promote the capital market development. For example, daily stock exchange trading hours were recently extended to five hours to six hours. Thus Korea became the first country in Asia to keep its stock exchange open during the lunch hour (USA Today, 2000).

Third, the brokerage commission rates for electronic stock trading are one-third or one-fourth of the commission rates for offline broking. As a result, price-sensitive customers are switching to electronic stock trading.

Current market conditions

The development of electronic stock trading services has been faster-than-expected. In spite of the short history of electronic stock trading in Korea, most local brokers offer electronic stock trading services as at August 2000.

The electronic trading value of stocks surged to nearly 63.1% of total trading value in August 2000. Excluding foreign investors and institutional investors, the electronic trading value of stocks reached a high of 74.9% (see Table 1). This is remarkable when compared to the US online brokerage penetration ratio of 35% for retail investors in June 2000 (Wall Street Journal, 2000). The number of electronic accounts totaled 3.5 million in August 2000 up 191.8% from 1.2 million in August 1999, representing 38.6% of total active customer accounts of about 9 million (see Table 2).

Korean electronic stock trading services were initially set up with indirect access through the Home trading System (HTS), which was linked to Internet Service Providers (ISPs). Direct access through the Web sites of each broker has recently developed, and has significant growth potential. Electronic stock trading via the Internet represents over 92% of total electronic stock trading value.

Table 1 - Electronic Trading Penetration in Korea

Month	Monthly Electronic Stock Trading Value	Monthly Stock Trading Value	Monthly Electronic Stock Trading Penetration	Monthly Electronic Stock Trading Penetration (only for individual investors)
01/1998	$440.7 m	$34,717.5 m	1.3%	1.5%
02/1998	$561.1 m	$37,431.4 m	1.5%	1.8%
03/1998	$608.0 m	$29,020.5 m	2.1%	2.5%
04/1998	$446.4 m	$17,425.4 m	2.6%	3.0%
05/1998	$418.2 m	$14,741.1 m	2.8%	3.4%
06/1998	$461.1 m	$15,377.2 m	3.0%	3.6%
07/1998	$707.0 m	$22,562.6 m	3.1%	3.7%
08/1998	$591.9 m	$16,119.0 m	3.7%	4.4%
09/1998	$629.9 m	$17,246.1 m	3.7%	4.3%
10/1998	$938.0 m	$26,718.1 m	3.5%	4.2%
11/1998	$1,604.2 m	$42,210.4 m	3.8%	4.5%
12/1998	$2,970.3 m	$79,980.5 m	3.7%	4.4%
01/1999	$3,869.4 m	$82,911.1 m	4.7%	5.5%
02/1999	$2,248.2 m	$36,027.5 m	6.2%	7.4%
03/1999	$4,303.7 m	$69,008.4 m	6.2%	7.4%
04/1999	$10,267.2 m	$139,252.7 m	7.4%	8.8%
05/1999	$13,460.6 m	$111,842.7 m	12.0%	14.3%
06/1999	$22,584.1 m	$144,243.8 m	15.7%	18.6%
07/1999	$50,603.2 m	$229,228.3 m	22.1%	26.2%
08/1999	$51,472.6 m	$177,390.6 m	29.0%	34.5%
09/1999	$46,380.9 m	$143,985.6 m	32.2%	38.3%
10/1999	$51,500.7 m	$134,550.6 m	38.3%	45.5%
11/1999	$95,574.9 m	$258,398.5 m	37.0%	43.9%
12/1999	$97,966.5 m	$243,579.1 m	40.2%	47.8%
01/2000	$92,724.3 m	$207,769.5 m	44.6%	53.0%
02/2000	$145,491.0 m	$296,805.5 m	49.0%	58.2%
03/2000	$158,412.0 m	$310,696.2 m	51.0%	60.6%
04/2000	$84,907.8 m	$157,285.6 m	54.0%	64.1%
05/2000	$106,605.6 m	$187,484.3 m	56.9%	67.6%
06/2000	$149,117.7 m	$252,612.6 m	59.0%	70.1%
07/2000	$115,450.5 m	$189,371.4 m	61.0%	72.4%
08/2000	$97,322.5 m	$154,339.4 m	63.1%	74.9%

(Source: Korea Securities Dealers Association, September 2000)

Table2 - Stock Brokerage Accounts in Korea

Month	Number of Electronic Accounts	Number of Total Accounts	Percentage of Electronic Accounts
01/1998	78,340	3,824,633	2.0%
02/1998	92,622	3,917,214	2.4%
03/1998	102,744	3,684,487	2.8%
04/1998	114,733	3,746,275	3.1%
05/1998	119,687	3,796,657	3.2%
06/1998	125,601	3,619,797	3.5%
07/1998	132,311	3,675,395	3.6%
08/1998	138,974	3,700,503	3.8%
09/1998	144,808	3,552,025	4.1%
10/1998	157,453	3,617,724	4.4%
11/1998	179,041	3,705,017	4.8%
12/1998	227,350	3,792,456	6.0%
01/1999	295,269	4,023,230	7.3%
02/1999	333,451	4,227,422	7.9%
03/1999	389,993	4,368,412	8.9%
04/1999	493,908	4,741,576	10.4%
05/1999	617,794	5,151,459	12.0%
06/1999	788,284	5,343,567	14.8%
07/1999	971,215	5,980,284	16.2%
08/1999	1,188,293	6,223,664	19.1%
09/1999	1,310,265	6,710,440	19.5%
10/1999	1,408,061	6,882,173	20.5%
11/1999	1,788,937	7,264,570	24.6%
12/1999	1,887,245	7,572,839	24.9%
01/2000	2,157,630	7,996,244	27.0%
02/2000	2,402,105	8,344,006	28.8%
03/2000	2,707,528	8,591,021	31.5%
04/2000	2,943,224	8,707,534	33.8%
05/2000	3,058,332	8,891,442	34.4%
06/2000	3,244,083	8,769,332	37.0%
07/2000	3,376,857	8,864,191	38.1%
08/2000	3,467,814	8,975,446	38.6%

(Source: Korea Securities Dealers Association, September 2000)

Comparison with the US situation

In the U.S., owing to a slow start on the part of the full-service brokers including Merrill Lynch in electronic stock broking, the original online brokers have successfully established a leading market position in the electronic stock trading market. However, the full-service brokers have recently started to provide electronic stock trading services, which could pose a significant threat to the existing online brokers.

Unlike the U.S. traditional full-service brokers, the leading Korean brokers' dominance in offline trading has successfully been transferred electronic stock trading services, given their extensive online networks and technology infrastructure. As a result, the electronic stock trading market has become even more concentrated than the traditional offline market (see the Table 3). The Table 3 shows that the aggregate market share of the five largest brokers is above 57%. It also indicates that their market shares are positively associated with the portions of electronic trading in their services.

Table 3: Major brokers in Korea

Brokers	Daishin	Samsung	LG	Daewoo	Hyundae	Total
Market Share	13.8%	13.0%	11.2%	10.1%	9.5%	57.6%
Portion of Electronic Trading in their Service	80.9%	74.1%	71.1%	69.6%	65.4%	
Commission for Electronic Trading	.136%	.135%	.12%	.13	.155%	
Commission for Traditional Trading	.40%	.43%	.40%	.50	.43%	

Since the Korean electronic stock trading service industry is already crowded and very competitive, most new entrants are likely to focus on niche markets such as bonds, mutual funds, and unlisted stocks.

The stock trading service is the fittest business to electronic commerce in Korea and the brokers are the best positioned to benefit from the development of e-finance services. On the back of a higher number of electronic customers and advanced information systems, Korean brokers are expected to not only expand their operations to offer more diversified and advanced online services but also provide non-financial services such as Internet advertising for banners in future.

The focus of this research is to apply electronic commerce to a specific financial sector (stock trading), in a specific geographical region (Korea), for a specific purpose (customer relationship outcomes).

Data collection

Population (Industry) Selection

As discussed previously, the Korean stock trading industry was selected for the empirical study. The stock trading industry has been selected because it is well positioned to take advantage of electronic commerce. Furthermore, the Korean stock trading industry has been selected for the remarkable growth of electronic trading through the Internet in Korea.

Sampling Procedures

This study is an attempt to assess the conditions encouraging individual investors' use of electronic commerce in stock trading and subsequent effects on customer relationship outcomes in the context of the Korean stock trading industry.

The individual customers (retail investors) of two major Korean stock trading brokers, that sponsored this empirical study, were selected for the sample population for this study. However, it was impossible to get a complete list of customers from these firms because of the strict regulation and concerns on privacy issues. Since the sampling frame for telephone or mail survey was not available, a field survey at the branches was selected for the alternative way of collecting empirical data for hypotheses testing. Thus a list of branches in the great Seoul area was obtained from these firms and a total of 138 traditional physical branches and 4 new cyber branches were identified.

Sampling of branches for the field survey was conducted based on the type (traditional physical branch versus cyber branch) and geographical dispersion to avoid local bias and to better represent the population. First, in order to ensure variability in the measure of use of electronic trading, all of 4 cyber branches were selected. Then the great Seoul area was divided into 6 geographical blocks and one physical branch in each block was selected after contacting the branch managers by telephone to check their willingness to help. In summary, a total of 10 branches including 4 cyber branches were selected for a field survey.

Through a customer intercept survey at the selected 10 branches, a total of 220 retail investors were contacted.

Field Survey

A customer intercept field survey was chosen for the empirical portion of this study because there was not an available customer lists for telephone survey or mail survey. Besides, we would expect that field survey yielded timely results and higher response rates through real-time interviewing. This method is often used and justified in marketing research, in particular in service marketing studies (Gwinner et al., 1998; Ruyter et al., 1998; Pritchard et al., 1999). In spite of the possibility of missing the investors conducting electronic trading from their office or home, we assumed that significant portion of them use the cyber branches near their office or home during lunch or other break time. It is because that they may not be allowed to do electronic trading at work or they may prefer high-speed access to the Internet and better IT (information technology) environment available at the cyber branches to plain dial-up connection at home. In addition, even the investors conducting electronic trading from their office or home need to be supplemented by some periodic or irregular visits to offline branches, where they can monitor real market atmosphere, discuss investment strategy with other investors or catch up informal information.

Interviewers

Four interviewers were hired to help with conducting the field survey. Each of them was given a two-hour training to introduce them to the survey and explain the content and flow of questions. The administrative plan including the compensation issue and the survey schedule was also covered in the training session.

Pretesting

Fifteen retail investors were arbitrarily selected among the employees of a major public company in Korea, and then contacted for pretesting the survey instrument. The original survey instrument was prepared in English and then was translated into Korean by the main researcher. Considering the result of pretesting, some ambiguous words or items were revised. In addition, in order to make the field survey more effective, some redundant items were combined and the length of survey instrument was reduced. It was because customers are unwilling to participate in a lengthy intercepted survey administered in a real field (Szymanski & Hise, 2000).

Actual Field Survey

The field survey took place during two weeks of mid September 2000. During the first week of the survey, we visited each of selected branches to check the exact locations, branch facilities, branch atmosphere, and average traffic of investors. In addition, we met the branch managers not only to get general information about their customers but also get the final permission to

conduct a field survey in their branches and set a specific date and time for the survey. After pre-visiting, the schedule for the field survey was set and the specific target branches were assigned to each interviewer. Considering our observation and the suggestions of branch managers, the time zone around the lunch hour (between 11:00 a.m. to 2:00 p.m.) was selected as a convenient time to intercept the investors. It was because that most investors were busy around the market opening or closing time and many employed investors or homemakers seemed to visit the brokers' branches near their office or home during lunch break. Each branch was visited once according to the schedule and about twenty responses were planned for each branch.

Under the help and cooperation of branch managers, respondents were intercepted randomly at the selected branches. Then the interviewer introduced the survey project, promised anonymity and confidentiality, and asked to participate in the survey. In order to encourage the investors' participation, the gift incentives including a computer CD-Rom case and a mouse pad were offered.

A primary screening question was used to ensure that potential respondents had been involved in stock trading through the two sponsoring brokers for at least six months. Then a self-administered questionnaire was given to the respondent with some explanation about how to fill out it. The interviewer collected the completed questionnaires after twenty minutes and provided the respondents with the offered gifts. Of 220 contacted respondents, 33 refused to participate and 17 respondents did not finish the survey. One of the provided

reasons for refusal to participate was their unhappiness with the portfolio performance. The main reason for incompletion was their tight schedule. Upon termination of data collection, a total of 170 retail investors were surveyed successfully, representing a response rate of 77%.

Sample Characteristics

The following tables list simple descriptive statistics for the complete sample.

First of all, according to Table 4, about half of respondents were in the age between 30 and 39. Table 5 showed that more than 80% of respondents were male investors. In addition, about 60% of them turned out to graduate four-year college (see Table 6) and have full-time jobs (see Table 8). This is consistent with the common sense that typical individual investors in Korea are normally male investors who are in the age of 30's, hold bachelor's degree, and are fully employed. Table 7 also showed that the respondents were well distributed in terms of annual income.

According to Table 9, the sample of this study was also divided into three groups including traders whose primary channel was electronic trading (71.2%), traders with telephone channel (14.7%), and traders with face-to-face channel (14.1%). Thus it would be said that this sample might represent all groups of individual investors regardless of a field survey at the selected branches. Furthermore, since about 60% of respondents turned out to have full-time jobs

(see Table 8), it would also be said that this sample might include the group of investors doing stock trading at their office.

Table 10 shows that 13.5% of respondents never use electronic trading for stock transactions. This fact implies that even a part of non-electronic investors, whose primary channel was non-electronic channel, uses electronic trading as a complementary channel for stock transactions.

According to Table 11, about 40% of respondents appeared to have no experience in offline stock trading. Table 12 shows that about 60% of respondents use only Internet for electronic stock transactions. Considering only electronic traders, this rate will go up to 73%. This fact is consistent with the general notion that the Internet has become a dominant platform for electronic stock trading in Korea.

Table 4 - Age

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Younger than 25	9	5.3%	1
Between 25 and 29	18	10.6%	2
Between 30 and 39	80	47.1%	3
Between 40 and 49	41	24.1%	4
50 or order	22	12.9%	5
Total	170	100.0%	

Table 5 – Gender

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Female	31	18.2%	0
Male	139	81.8%	1
Total	170	100.0%	

Table 6 - Education

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
High school graduate or less	18	10.6%	1
Attended college	23	13.5%	2
Graduate 2-year college	20	11.8%	3
Graduate 4-year college	97	57.1%	4
Postgraduate work degree	12	7.1%	5
Total	170	100.0%	

Table 7 - Income

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Under $15,000	33	19.4%	1
Between $15,000 and $29,999	58	34.1%	2
Between $30,000 and $44,999	43	25.3%	3
Between $45,000 and $59,999	17	10.0%	4
$60,000 or more	19	11.2%	5
Total	170	100.0%	

Table 8 – Job

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Unemployed	30	17.6%	1
Homemaker	13	7.6%	2
Student	10	5.9%	3
Part-time employee (Less than 30 hours per week)	17	10.0%	4
Full-time employee (30 or more hours per week)	100	58.8%	5
Total	170	100.0%	

<p align="center">Table 9 – Primary channel</p>

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
By electronic trading	121	71.2%	0
By telephone	25	14.7%	1
By face-to-face at branch office	24	14.1%	2
Total	170	100.0%	

<p align="center">Table 10 – Electronic traders vs. Non-electronic traders</p>

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Non-electronic traders (Never use electronic trading)	23	13.5%	0
Electronic traders	147	86.5%	1
- 1% to 20%	17		
- 21% to 40%	8		Mean of the
- 41% to 60%	7		degree of use
- 61% to 80%	16		= 71%
- 81% to 100%	99		
Total	170	100.0%	

<p align="center">Table 11 – Offline experience</p>

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Investors without offline experience	67	39.4%	0
Investors with offline experience	103	60.6%	1
Total	170	100.0%	

<p align="center">Table 12 – Internet Usage</p>

Original Figures	Frequency	Percentage of Cases	Grouped Categories and Scores
Other investors	63	37.1%	0
Investors using only Internet	107	62.9%	1
Total	170	100.0%	

CHAPTER 4

RESULTS

The current chapter reports the results obtained from the field survey. Included in the presentation are procedures employed to interpret the data collected and to evaluate their fit with what has been conceptualized and proposed. Empirical evidence is furnished to reveal the presence (absence) of significant relationship between the variables.

General Data Preparation

Data Integrity Checks

To detect entry errors and ensure accuracy of entered data, seventeen cases (10%) in the data set were randomly selected and compared with the original responses recorded in the paper questionnaire. In addition, as another statistical technique for detecting errors, univariate frequency tables were generated to check if any unusual scores were revealed. As a result of conducting data checks, several errors were identified and properly corrected.

Missing Data Treatment

As discussed in the previous chapter, 17 of 187 respondents in the sample abandoned the survey instrument before it was completed. Their willingness to

complete the questionnaire might be eliminated by a little lengthy questionnaire or their time pressure at the time of the survey.

For 170 completed responses, due to the advantage of real-time on-site field survey, there were hardly any missing values in the items measuring variables for conditions of use, variable for use of electronic commerce in stock trading, and variables for relationship outcomes. However, there were a few missing values in the control variables, in particular income, which might be considered too sensitive or private by some respondents. The missing values were replaced by the mean scores of the variables.

Construction of Index Measures

Construct Validity and Factor Analysis

It is important that survey questions represent the intended constructs. To establish construct validity such as convergent and discriminant validity, as well as unidimensionality, the survey items constructed for the variables of this study were factor analyzed using SPSS 9.0 for Windows. The principal components method was used to extract factors sequentially.

Survey items measuring the five constructs for conditions of use, including personal innovativeness, customer knowledge, price sensitivity, time pressure, social pressure, were factor analyzed (see Table 13 and 14 for factor loading). Items with low factor loadings and/or high cross loadings were eliminated. Items with high factors loadings were summed and then averaged for the construction

of indices. As a result, both the indices for time pressure and social pressure excluded in appropriate items and became single-item measures.

In addition, survey items measuring the construct of use of electronic trading was also factor analyzed. As expected, the two items loaded on single factor and showed a very consistent pattern.

Finally, survey items measuring the four constructs for relationship outcomes, including service quality, overall satisfaction, attitudinal loyalty and actual retention, were factor analyzed. Regarding service quality, three items with low factor loadings and/or high cross loadings were eliminated and six remaining items with high factors loadings were summed and then averaged for the construction of index. In line with our expectation, the items measuring overall satisfaction, attitudinal loyalty and actual retention loaded on a single factor respectively and also showed a consistent pattern respectively.

Reliability

Aside from validity concerns, it is also important to check the reliability of the index measures constructed. As a commonly used measure of internal consistency reliability, Cronbach's Alpha was computed using SPSS 9.0 for Windows. Table 15 shows the standardized item alpha scores for all the indices in this study. As seen in Table 15, all index measures of the survey were reliable enough not to worry about the lack of reliability in measurement. The reliability level for all index measures exceeded the often-cited benchmark of .70 recommended by Nunnally (1978). The index for use of electronic trading has

been measured most reliably. The index measures for relationship outcome variables have been measured more reliably than those for variables for conditions of use.

Table 13 – Indices Resulting from Factor Analysis

Factor (variance explained)	Factor Loadings
Personal Innovativeness (84.5%)	
If I heard a new information technology, I would look for ways to experiment with it	**.91**
Among my peers, I am usually the first to try out new information technologies	**.91**
Customer Knowledge (79.2%)	
To what extent do you know about stock trading	**.89**
To what extent do you know about electronic channels including the Internet	**.89**
Price Sensitivity (79.5%)	
I use electronic trading to take advantage of low prices	**.89**
I am very concerned about low prices	**.89**
Use of Electronic Trading (97.0%)	
The percentage of your total number of orders made through electronic trading during last six months	**.99**
The percentage of your total $value of orders was made through electronic trading during last six months	**.99**
Service Quality (60.3%)	
This broker provides consistent and dependable performance	**.79**
This broker provides its services at the time it promises to do so	**.83**
This broker insists on error-free records and accurate bills	**.71**
This broker's service is easily and conveniently accessible	**.79**
This broker responds promptly to customers' requests	**.84**
This broker gives customers personalized and individualized attention	**.69**

Table 14 – Indices Resulting from Factor Analysis (continued)

Factor (variance explained)	Factor Loadings
Overall Satisfaction (74.8%)	
I feel that this broker manages my account in a good way	**.84**
I am delighted with my overall relationship with this broker	**.90**
I wish more of my suppliers were like this broker	**.85**
Attitudinal Loyalty (73.6%)	
I am very committed to continue the relationship with this broker	**.81**
Maintaining a long-term relationship with this broker is very important to me	**.84**
I would recommend this broker to someone who seeks my advice	**.93**
I say positive things about this broker to other people	**.88**
I gladly encourage friends and relatives to do business with this broker	**.93**
I will consider this broker as the first choice if I buy new financial service or product	**.84**
I am willing to do buy other financial services through this broker	**.76**
Actual Retention (95.3%)	
The percentage of your total number of orders was made through this broker during last six months	**.98**
The percentage of your total $value of orders was made through this broker during last six months	**.98**

Table 15 – Internal Consistency Reliability of Index Measures

Index	Cronbach's Alpha (α)
Personal Innovativeness	.78
Customer Knowledge	.73
Price Sensitivity	.74
Use of Electronic Trading	.97
Service Quality	.87
Overall Satisfaction	.83
Attitudinal Loyalty	.94
Actual Retention	.95

Hypothesis Testing

Differences between Electronic traders and Non-electronic traders

The penetration of electronic trading via the Internet in Korea has been increased significantly, and the electronic linkage with customers through the Internet has become a strategic necessity for competition in the Korean stock trading industry. Accordingly, this study suggests that most investors in the sample (71.2%) have already recognized the power of electronic channels as a primary means for stock trading. This is consistent with the statistical result reported by Korea Securities Dealers Association (see Table 1). According to Table 10, on average, the extent of electronic trading use is quite high. Only a small part of sample investors (13.5%) have never adopted electronic trading. More than half of sample investors heavily rely on electronic trading. Thus the average extent of electronic trading use was found to be as high as 71% in terms of number of orders and $ amount of orders. It implies that electronic trading is in the pretty mature stage in the Korean stock trading industry.

The result of this study also indicated that most electronic traders show higher customer relationship outcomes than non-electronic traders, enjoying the unique potential of electronic trading. In this respect, there were very significant differences in the average levels of perceived service quality, overall satisfaction, and attitudinal loyalty outcomes between electronic trading users and non-users (see the t-test results in Table 16). On average, according to another t-test, investors using electronic trading as a primary channel showed significantly

Table 16 – Comparison of Electronic Trading Users and Non-Users

Variables	Mean Scores (Std. Deviation)		Difference	
	Users (N=147)	Non-Users (N=23)	t-score	Probability Level
Age	3.19 (.99)	3.91 (.85)	3.32	.00**
Gender	.86 (.35)	.57 (.51)	-3.47	.00**
Education	3.43 (1.08)	2.96 (1.40)	-1.87	.06**
Income	2.46 (1.17)	3.48 (1.24)	3.86	.00***
Personal Innovativeness	3.19 (.86)	2.59 (.76)	-3.20	.00**
Customer Knowledge	3.40 (.83)	2.46 (.69)	-5.15	.00***
Price Sensitivity	3.78 (.98)	2.61 (.66)	-5.53	.00***
Time Pressure	3.48 (1.04)	3.09 (.10)	-1.71	.09†
Social Pressure	3.28 (1.22)	2.13 (.69)	-4.40	.00***
Access Capacity	4.69 (.68)	3.70 (.93)	-6.22	.00***
Frequency of Order	2.80 (1.62)	2.52 (1.28)	-.79	.43
Transaction Volume	3.12 (1.51)	4.35 (1.23)	3.70	.00***
Service Quality	3.63 (.72)	3.21 (.64)	-2.66	.01**
Overall Satisfaction	3.44 (.80)	2.86 (.82)	-3.25	.00**
Attitudinal Loyalty	3.44 (.80)	2.64 (.75)	-4.49	.00***
Actual Retention	4.34 (1.23)	4.48 (.90)	.50	.62

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Notes: Standard deviation is shown in parentheses. Probability level is 2-tailed significance.

Table 17 – Comparison of Traders with Different Channels

Variables	Mean Scores (Std. Deviation)		Difference	
	Traders with electronic channel (N=121)	Traders with traditional channels (N=49)	t-score	Probability Level
Age	3.15 (1.01)	3.63 (.91)	2.92	.00**
Gender	.89 (.31)	.63 (.49)	-4.15	.00***
Education	3.42 (1.07)	3.22 (1.28)	-1.03	.31
Income	2.37 (1.16)	3.14 (1.23)	3.86	.00***
Personal Innovativeness	3.24 (.85)	2.81 (.83)	-2.99	.00**
Customer Knowledge	3.48 (.82)	2.76 (.80)	-5.24	.00***
Price Sensitivity	3.88 (.97)	2.99 (.88)	-5.56	.00***
Time Pressure	3.56 (1.04)	3.12 (.97)	-2.49	.01*
Social Pressure	3.27 (1.25)	2.76 (1.09)	-2.53	.01*
Access Capacity	4.70 (.68)	4.20 (.94)	-3.87	.00***
Frequency of Order	2.97 (1.61)	2.27 (1.38)	-2.67	.01**
Transaction Volume	3.07 (1.55)	3.82 (1.40)	2.94	.00**
Service Quality	3.73 (.69)	3.21 (.67)	-4.46	.00***
Overall Satisfaction	3.53 (.76)	2.95 (.83)	-4.40	.00***
Attitudinal Loyalty	3.53 (.76)	2.83 (.81)	-5.37	.00***
Actual Retention	4.51 (1.05)	4.00 (1.44)	-2.56	.01*

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$
Notes: Standard deviation is shown in parentheses. Probability level is 2-tailed significance. Traditional channels include telephone and face-to-face channels.

higher scores in all relationship outcomes than investors with traditional channels such as telephone channel and face-to-face channel (see Table 17).

In addition, t-test also was used to test whether demographic variables were associated with use of electronic trading. The results showed significant differences in age, where electronic investors are younger, gender, where electronic investors are more likely males, and income, where electronic investors have lower than non-electronic investors. It might be noted that little significant differences were observed with regard to education (no significant differences if equal variances are not assumed). Therefore, it became necessary to control for age, gender and income in all analyses to ensure that conclusions regarding use of electronic trading and relationship outcome differences were not confounded by differences in demographic variables.

Hierarchical Regression Analysis

Hierarchical regression analysis served as the primary tool for testing research hypotheses. It involved the comparison of two regression models. The complete model contained four terms: the dependent variable, control variables, the hypothesized predictors and the interaction terms of predictors. The reduced model omitted the interaction terms. With respect to the interaction hypotheses, the significance of the interaction terms was tested by calculating the F ratio corresponding to the difference between the reduced model and the complete model. If the F ratio was not significant, the complete model did not have better

explanatory power than the reduced model and the interaction hypotheses are rejected.

To check the problem of collinearity among the various predictors, the Pearson correlations were examined (Thong, 1999). It was because high intercorrelations or redundancies among the independent variables might introduce unwanted multicollinearity in the regression models (Louadi, 1998). There is no evidence of significant possibility that collinearity among the predicting variables might be a problem (see Table 18).

However, to address the possible multicollinearity problem, we followed Cronbach's (1987) and Lance's (1988) suggestions to center the component variables prior to forming the interaction terms. Centering method is a procedure whereby the mean of each independent variable is subtracted from its score (Louadi, 1998). This method provides a means of controlling for collinearity and avoids confounding the main effects in moderated regressions (Speed & Thompson, 2000).

Regression results predicting use of electronic trading

Separate two-step, hierarchical regression analysis was performed to test hypotheses H1 and H2 predicting use of electronic trading. At step 1, we entered three demographic variables, including age, gender and income, as control variables. In addition, eight predictors were entered. At step 2, ten interaction terms of personal factors and situational factors were entered all in once into the model.

Table 18 – Pearson Correlations among Variables

	PI	CK	PS	TP	SP	AC	OF	TV	UE	EX	IN	SQ	OS	AR	AL
PI	1.0														
CK	.34**	1.0													
PS	.12	.16*	1.0												
TP	.21**	.25**	.22**	1.0											
SP	.13	.15	.14	.12	1.0										
AC	.16*	.27**	.13	-.01	.23**	1.0									
OF	-.04	.24**	.14	.39**	-.05	-.07	1.0								
TV	-.15	-.21**	-.12	-.06	-.07	-.21**	.06	1.0							
UE	.22**	.45**	.40**	.24**	.23**	.34**	.22**	-.33**	1.00						
EX	-.13	-.11	-.14	-.21**	-.28**	-.09	-.13	-.16*	-.43**	1.00					
IN	.14	.27**	.32**	.18**	.17**	.33**	.19*	-.22**	.54**	-.37**	1.00				
SQ	.23**	.30**	.05	.27**	-.01	.10	.08	-.20**	.36**	-.14	.09	1.00			
OS	.12	.20**	.02	.18*	-.08	.06	.10	-.17*	.37**	-.24**	.12	.74**	1.00		
AR	-.06	.12	-.04	.07	-.09	-.05	.10	-.07	.28**	-.09	.05	.29**	.26**	1.00	
AL	.12	.24**	.10	.24**	-.05	.15*	.22**	-.13	.43**	-.27**	.21**	.68**	.78**	.17*	1.00

** Correlation is significant at the .01 level (p < .01).
* Correlation is significant at the .05 level (p < .05).

PI: Personal Innovativeness
CK: Customer Knowledge
PS: Price Sensitivity
TP: Time Pressure
SP: Social Pressure
AC: Access Capacity
FO: Order Frequency
TV: Transaction Volume

UE = Use of Electronic Trading
EX = Offline Trading experience
IN = Internet Usage
SQ = Service Quality
OS = Overall Satisfaction
AR = Actual Retention
AL = Attitudinal Loyalty

Table 19 – Predicting Use of Electronic Trading

Variables	Reduced Model		Complete Model	
	Standardized Beta (β)	Probability Level	Standardized Beta (β)	Probability Level
Control Variables				
Age	-.09	.20	-.10	.16
Gender	.16	.01*	.16	.02 *
Income	-.26	.00***	-.28	.00 ***
Personal factors				
Personal Innovativeness (PI)	.06	.33	.05	.43
Customer Knowledge (CK)	.27	.00***	.26	.00 ***
Price Sensitivity (PS)	.23	.00***	.23	.00 ***
Situational factors				
Time Pressure (TP)	.04	.59	.04	.54
Social Pressure (SP)	.08	.21	.11	.11
Access Capacity (AC)	.13	.04*	.13	.05†
Transaction characteristics				
Frequency of Order (FO)	.14	.03*	.17	.01 *
Transaction Volume (TV)	-.04	.55	-.04	.55
Interactions				
TP x PI			-.04	.60
TP x CK			-.06	.33
TP x PS			.00	.97
TP x FO			-.12	.06†
TP x TV			.05	.46
SP x PI			-.04	.59
SP x CK			-.03	.70
SP x PS			.00	.99
SP x FO			-.06	.39
SP x TV			.01	.92
Multiple R	.71		.73	
R-square	.50		.53	
Adjusted R-square	.47		.47	
F	14.43***		8.02***	
Δ R-square			.03	
Δ F			.99	

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

As shown, Table 19 represents the regression results of the models with use of electronic trading as the dependent variable. The result of the reduced regression model generally turned out as hypothesized. The percentage of variance explained (*R-square*) was 50%, implying a statistically significant ($p <$ .001) and satisfactory model. The *F*-statistics is also statistically significant.

Two control variables, gender (β = .16, p < .05) and income (β = -.26, p < .001) were significantly related to use of electronic trading. The effect of the control variables was almost unchanged when the interactions were entered in the regression model.

In the model, the predictors such as customer knowledge, price sensitivity, access capacity and frequency of order appeared to be significant in terms of both the signs and the significance of the beta weights when determining use of electronic trading. Thus hypotheses H1b, H1c, H1f, and H1g were supported. First, as for the situational factors, one of them was found statistically significant predictor, namely access capacity (β = .13, p < .05). Two personal factors including customer knowledge (β = .27, p < .001) and price sensitivity (β = .23, p < .001) were also found statistically very significant. In addition, one of two transaction characteristics, frequency of order (β = .14, p < .05) appeared to be significant at the alpha level of .05. The result showed that customer knowledge and price sensitivity are the most significant predictors.

When we included 10 interaction terms altogether, the increase in *R-square* was only .03, which was not significant. This means that the introduction of the interaction terms in regression did not add significantly to the variance explained.

Only the interaction effect between time pressure and frequency of order were significant but showed negative coefficient. The other interactions were found not to be significant. Thus hypothesis H2 predicting the interaction relationship between personal factors and situational factors on use of electronic trading totally was rejected.

Regression results predicting customer relationship outcomes

A series of hierarchical regression analyses were also performed to test hypotheses H3 through H12 predicting customer relationship outcomes. At step 1, we entered three demographic variables and eight variables for conditions of use as control variables. In addition, three predictors including use of electronic trading and two dummy variables were entered. At step 2, eight interaction terms between conditions of use and use of electronic trading were entered altogether into the model.

All of four regression equations were run for the entire sample using use of electronic trading as a main predictor. It was because there did not seem to be a strong artifact from including non-electronic traders in predicting the effects of use of electronic trading. In other words, there was no significant difference between regressions for the entire sample and those for only electronic traders.

Predicting service quality

As expected by the predictions of hypothesis 3, the coefficient of use of electronic trading (β = .36, p < .01) is significantly different from zero at the alpha

level of .01 (see table 20). Thus hypothesis H3 was supported. It means that use of electronic trading is very positively related to customers' perceived service quality. The more they use electronic trading for stock transaction, the higher service quality the individual investors may enjoy. Surprisingly, the effect of a dummy variable for Internet usage (β = -.18, p < .05) was found to be significant but negative. This result shows that electronic traders using only the Internet have lower service quality than other investors using non-Internet channels.

Among the control variables, time pressure appeared to be statistically significant predictor (β = .21, p < .05), indicating that the perceived service quality be higher when the investors were under time pressure. Gender (β = .14, p < .10) and social pressure (β = -.14, p < .10) showed only marginal significance.

The reduced model turned out to have relatively low (*R-square* is .26, while *Adjusted R-square* is .20) but statistically significant (p < .001) predictive power. As for the complete model, it did not provide additional significant power of prediction. The increase in *R-square* was only .05, which was not statistically significant. The increase in *F*-statistics was also not statistically significant. Therefore, though the interaction between price sensitivity and use of electronic trading on service quality was significant (β = .20, p < .05), the whole interactions between conditions of use and use of electronic trading appeared to be not significant when determining customers' perceived service quality. Accordingly, against our expectation, the hypothesis H4 was rejected.

Table 20 – Predicting Service Quality

Variables	Reduced Model		Complete Model	
	Standardized Beta (β)	Probability Level	Standardized Beta (β)	Probability Level
Control Variables				
Age	-.02	.82	-.03	.71
Gender	.14	.07†	.11	.18
Income	.03	.74	.00	.98
Personal Innovativeness (PI)	.10	.20	.11	.15
Customer Knowledge (CK)	.09	.30	.13	.17
Price Sensitivity (PS)	-.11	.17	-.14	.07†
Time Pressure (TP)	.21	.01*	.18	.03*
Social Pressure (SP)	-.14	.06†	-.09	.30
Access Capacity (AC)	.01	.91	-.02	.80
Frequency of Order (FO)	-.07	.38	-.09	.31
Transaction Volume (TV)	-.05	.56	-.04	.67
Independent Variables				
Use of Electronic Trading (UE)	.36	.00**	.39	.00**
Offline Experience	-.03	.75	-.02	.83
Internet Usage	-.18	.05*	-.18	.05*
Interactions				
PI x UE			-.10	.26
CK x UE			-.09	.33
PS x UE			.20	.02*
TP x UE			-.02	.86
SP x UE			-.14	.12
AC x UE			.07	.45
OF x UE			.04	.66
TV x UE			-.03	.75
Multiple R	.51		.56	
R-square	.26		.31	
Adjusted R-square	.20		.21	
F	3.95***		3.00***	
Δ R-square			.05	
Δ F			1.25	

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Predicting overall satisfaction

As shown in Table 21, in the reduced model predicting overall satisfaction, use of electronic trading (β = .41, p < .001) was found to have a positive and very strong relationship with overall satisfaction. Thus hypothesis H5 was supported.

Interestingly, a dummy variable, existence of offline experience (β = -.15, p < .10) was found to be a marginally significant but negative predictor of overall satisfaction. Against our expectation, electronic traders who don't have any offline stock trading experience were found to have a higher level of overall satisfaction with their brokers. Thus hypothesis H11b was rejected.

Among control variables, price sensitivity (β = -.16, p < .05) and social pressure (β = -.22, p < .01) were found to be negatively associated with overall satisfaction. This implies that investors with higher price sensitivity and social pressure tend to have lower overall satisfaction. The model also indicates that older and male investors tend to have higher overall satisfaction with their brokers. The regression model shows an overall fit at the magnitude of *R-square* = .27 (*Adjusted R-square* of .20).

As for the complete model including eight interactions, it showed similar results as the reduced model. In other words, the increase *R-square* was only .04, which was not significant. The increase in *F*-statistics was also not statistically significant. Therefore, in spite of the positive interaction between price sensitivity and use of electronic trading (β = .15, p < .10), the hypotheses H6 regarding eight interactions were rejected.

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Table 21 – Predicting Overall Satisfaction

Variables	Reduced Model		Complete Model	
	Standardized Beta (β)	Probability Level	Standardized Beta (β)	Probability Level
Control Variables				
Age	.19	.03*	.17	.06†
Gender	.14	.08†	.12	.17
Income	-.05	.53	-.06	.47
Personal Innovativeness (PI)	.06	.41	.08	.33
Customer Knowledge (CK)	.08	.37	.09	.32
Price Sensitivity (PS)	-.16	.04*	-.19	.02*
Time Pressure (TP)	.09	.29	.06	.47
Social Pressure (SP)	-.22	.00**	-.16	.06†
Access Capacity (AC)	.02	.83	-.01	.94
Frequency of Order (FO)	-.07	.41	-.04	.65
Transaction Volume (TV)	-.07	.42	-.08	.38
Independent Variables				
Use of Electronic Trading (UE)	.41	.00***	.38	.00**
Offline Experience	-.15	.07†	-.14	.09†
Internet Usage	-.15	.10	-.15	.09†
Interactions				
PI x UE			-.03	.72
CK x UE			-.13	.14
PS x UE			.15	.08†
TP x UE			.08	.38
SP x UE			-.14	.12
AC x UE			.05	.59
OF x UE			-.08	.36
TV x UE			.02	.86
Multiple R	.52		.56	
R-square	.27		.31	
Adjusted R-square	.20		.20	
F	4.01***		2.97***	
Δ R-square			.04	
Δ F			1.10	

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Predicting attitudinal loyalty

In predicting attitudinal loyalty, use of electronic trading (β = .42, p < .001) is statistically significant and has very strong effect (see the reduced model in Table 22). Thus hypothesis H7 was supported. It means that use of electronic trading is very strongly related to customers' attitudinal loyalty to their broker. It suggests that customers heavily using electronic trading are more likely to show relationship commitment to their brokers, willingness to recommend, and willingness for one-stop shopping through their brokers. The dummy variable for offline experience (β = -.16, p < .10) was found to be a marginally significant but negative predictor of attitudinal loyalty. Electronic traders who don't have any offline stock trading experience seems to be more likely to show a higher level of attitudinal loyalty to their brokers. Thus hypothesis H11c was rejected. Another dummy variable for Internet usage was found not to be significant. Older investors expressing higher overall satisfaction were again found to show higher attitudinal loyalty. In addition, investors with higher social pressure (β = -.20, p < .01) tend to have lower attitudinal loyalty. The overall fit of the regression model was good at the magnitude of _R-square_ = .28 (_Adjusted R-square_ = .22).

Considering interactions, the complete model did not provide better prediction in spite of the existence of two significant interaction effects. Increase _R-square_ was only .06, which didn't reach significance. The increase in _F_-statistics was also not statistically significant. Thus hypotheses H9 regarding interaction effects were rejected.

Table 22 – Predicting Attitudinal Loyalty

Variables	Reduced Model		Complete Model	
	Standardized Beta (β)	Probability Level	Standardized Beta (β)	Probability Level
Control Variables				
Age	.17	.05*	.16	.07†
Gender	.02	.79	-.04	.65
Income	.03	.76	.04	.66
Personal Innovativeness (PI)	.03	.68	.04	.62
Customer Knowledge (CK)	.06	.54	.07	.45
Price Sensitivity (PS)	-.11	.17	-.15	.05†
Time Pressure (TP)	.10	.21	.07	.37
Social Pressure (SP)	-.20	.01**	-.13	.11
Access Capacity (AC)	.11	.16	.04	.61
Frequency of Order (FO)	.05	.57	.03	.69
Transaction Volume (TV)	-.05	.56	-.04	.63
Independent Variables				
Use of Electronic Trading (UE)	.42	.00***	.50	.00***
Offline Experience	-.16	.06†	-.15	.08†
Internet Usage	-.07	.40	-.09	.30
Interactions				
PI x UE			-.06	.50
CK x UE			-.06	.52
PS x UE			.19	.02*
TP x UE			.06	.52
SP x UE			-.19	.03*
AC x UE			-.04	.69
OF x UE			.05	.62
TV x UE			-.07	.41
Multiple R	.53		.58	
R-square	.28		.34	
Adjusted R-square	.22		.24	
F	4.37***		3.42***	
Δ R-square			.06	
Δ F			1.53	

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

According to the reduced model in Table 23, not surprisingly, use of electronic trading (β = .48, p < .001) turned out to be a very significant predictor of actual retention. This indicates that there is a very strong positive relationship between these two composite indices measuring investors' actual behaviors. Thus hypothesis H8 was supported. Among control variables, price sensitivity and social pressure were found to be negatively associated with actual retention. Under the interaction effects, these associations became stronger. The regression model shows an overall fit at the magnitude of *R-square* = .18 (*Adjusted R-square* = .10).

As for the complete regression model considering eight interaction effects, it showed better explanatory power. Increase in *R-square* was .12, which was statistically significant at the alpha level of .01. Accordingly, three coefficients of interactions appeared to be significant. The interactions between social pressure and use of electronic trading (β = .28, p < .01), between personal innovativeness and use of electronic trading (β = .17, p < .05), and between price sensitivity and use of electronic trading (β = .14, p < .10) were positive and significant. Thus it is expected that, in the presence of high personal innovativeness, high price sensitivity, and high social pressure, use of electronic trading will be more likely to enhance actual retention. Thus hypotheses H10a, H10c and H10e were supported.

In addition, under the interaction effects, the predictive power of main effect (use of electronic trading) was much enhanced (β was increased from .48 to .62).

Table 23 – Predicting Actual Retention

Variables	Reduced Model Standardized Beta (β)	Reduced Model Probability Level	Complete Model Standardized Beta (β)	Complete Model Probability Level
Control Variables				
Age	-.06	.53	-.07	.44
Gender	.06	.50	.07	.44
Income	.12	.19	.11	.23
Personal Innovativeness (PI)	-.13	.11	-.11	.17
Customer Knowledge (CK)	-.01	.95	-.02	.81
Price Sensitivity (PS)	-.14	.09†	-.15	.06†
Time Pressure (TP)	.04	.66	.07	.43
Social Pressure (SP)	-.14	.09†	-.23	.01**
Access Capacity (AC)	-.12	.15	-.05	.59
Frequency of Order (FO)	-.00	.99	-.03	.72
Transaction Volume (TV)	-.00	.99	.04	.64
Independent Variables				
Use of Electronic Trading (UE)	.48	.00***	.62	.00***
Offline Experience	-.02	.85	-.00	.99
Internet Usage	-.09	.32	-.06	.49
Interactions				
PI x UE			.17	.05*
CK x UE			-.07	.46
PS x UE			.14	.09†
TP x UE			.01	.95
SP x UE			.28	.00**
AC x UE			-.13	.19
OF x UE			-.01	.91
TV x UE			-.06	.47
Multiple R	.42		.54	
R-square	.18		.30	
Adjusted R-square	.10		.19	
F	2.35**		2.81***	
Δ R-square			.12	
Δ F			3.15**	

†: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Table 24 – Summary of Expected and Obtained Relationships (H1 to H12)

Independent Variables	Use of Electronic Trading (UE) expect	Use of Electronic Trading (UE) obtain	Service Quality expect	Service Quality obtain	Overall Satisfaction expect	Overall Satisfaction obtain	Attitudinal Loyalty expect	Attitudinal Loyalty obtain	Actual Retention expect	Actual Retention obtain
Age	-	0								
Gender	+	+*								
Income	-	-***								
Personal Innovativeness (PI)	+	0								
Customer Knowledge (CK)	+	+***								
Price Sensitivity (PS)	+	+***								
Time Pressure (TP)	+	0								
Social Pressure (SP)	+	0								
Access Capacity (AC)	+	+*								
Frequency of Order (FO)	+	+*								
Transaction Volume (TV)	+	0								
Use of Electronic Trading			+	+**	+	+***	+	+***	+	+***
Offline Experience			+	0	+	-†	+	-†	+	0
Internet Usage			+	-*	+	0	+	0	+	0
Interactions PI x UE			+	0	+	0	+	0	+	+*
CK x UE			+	0	+	0	+	0	+	+†
PS x UE			+	0	+	0	+	0	+	0
TP x UE			+	0	+	0	+	0	+	+**
SP x UE			+	0	+	0	+	0	+	0
AC x UE			+	0	+	0	+	0	+	0
OF x UE			+	0	+	0	+	0	+	0
TV x UE			+	0	+	0	+	0	+	0

Note: No relationships were expected or hypothesized for blanks.   †: $p < .10$, *: $p < .05$, **: $p < .01$, ***: $p < .001$

Considering research hypotheses from H1 to H12, Table 24 provides a summary of expected and obtained relationships.

Results of Path Model

As Figure 2 indicates, in the path model (structural equation model) use of electronic trading is specified as an exogenous variable, and service quality, overall satisfaction, attitudinal loyalty, and actual retention are specified as endogenous variables. Figure 3 contains the overall goodness of fit indices and the standardized parameter estimates for the hypothesized model (H13 to H18). This model was tested using the LISREL 8.2, which is a program for structural equation modeling.

The overall goodness of fit indices suggests a suitable and acceptable fit of the model to the data. The value of Chi-square statistic of 357.37 with 161 degrees of freedom indicated that the LISREL model would not be rejected by a test. This Chi-square statistic is statistically significant because our sample size (N = 170) is within the range recommended ($100 < N < 200$) for this statistic (Szymanski & Hise, 2000). The goodness of fit index (GFI) value turned out to be .82. Though it is a little smaller than the general cutoff value of .90, this may be acceptable fit value because the sample size of this study is smaller than 250 (Hu & Bentler, 1995). The comparative fit index (CFI) value appeared to be .93, which is greater than the cutoff value of .90. This acceptable value of the CFI suggests that the hypothesized path model represented an adequate fit to the data (Byrne, 1994).

As shown in Figure 3, five of nine standardized path coefficients are positive and statistically significant at the alpha level of .05 (t value is greater than 1.96). The five supports are found for relationships between use of electronic trading and service quality (γ = .31, p < .05), between service quality and overall satisfaction (β = .76, p < .05), between overall satisfaction and attitudinal loyalty (β = 1.12, p < .05), between use of electronic trading and actual retention (γ = .22, p < .05), and finally between service quality and actual retention (β = .49, p < .05). Thus hypotheses H13, H14b, and H15a were supported and H3 and H9 were confirmed again. However, inconsistent with the previous multiple regression results, the relationships between use of electronic trading and overall satisfaction (H5) and between use of electronic trading and attitudinal loyalty (H7) were not confirmed here.

Instead of a direct effect, use of electronic trading appeared to have an indirect effect through service quality on overall satisfaction. Thus hypothesis H16a was supported. However, use of electronic trading appeared not to have an indirect effect through service quality on attitudinal loyalty. Thus hypothesis H16b was rejected. In the meantime, use of electronic trading appeared to have not only a direct effect but also an indirect effect through service quality on actual retention. Thus hypothesis H16c was also supported.

In addition, according to Figure 3, use of electronic trading turned out to have an indirect effect through overall satisfaction as well as service quality on customers' attitudinal loyalty. Thus H18a was also supported.

Figure 3 - The Result of Path Model

.49*
(t=1.97)

1.12*
(t=4.95)

.76*
(t=7.45)

.22*
(t=2.74)

.31*
(t=4.77)
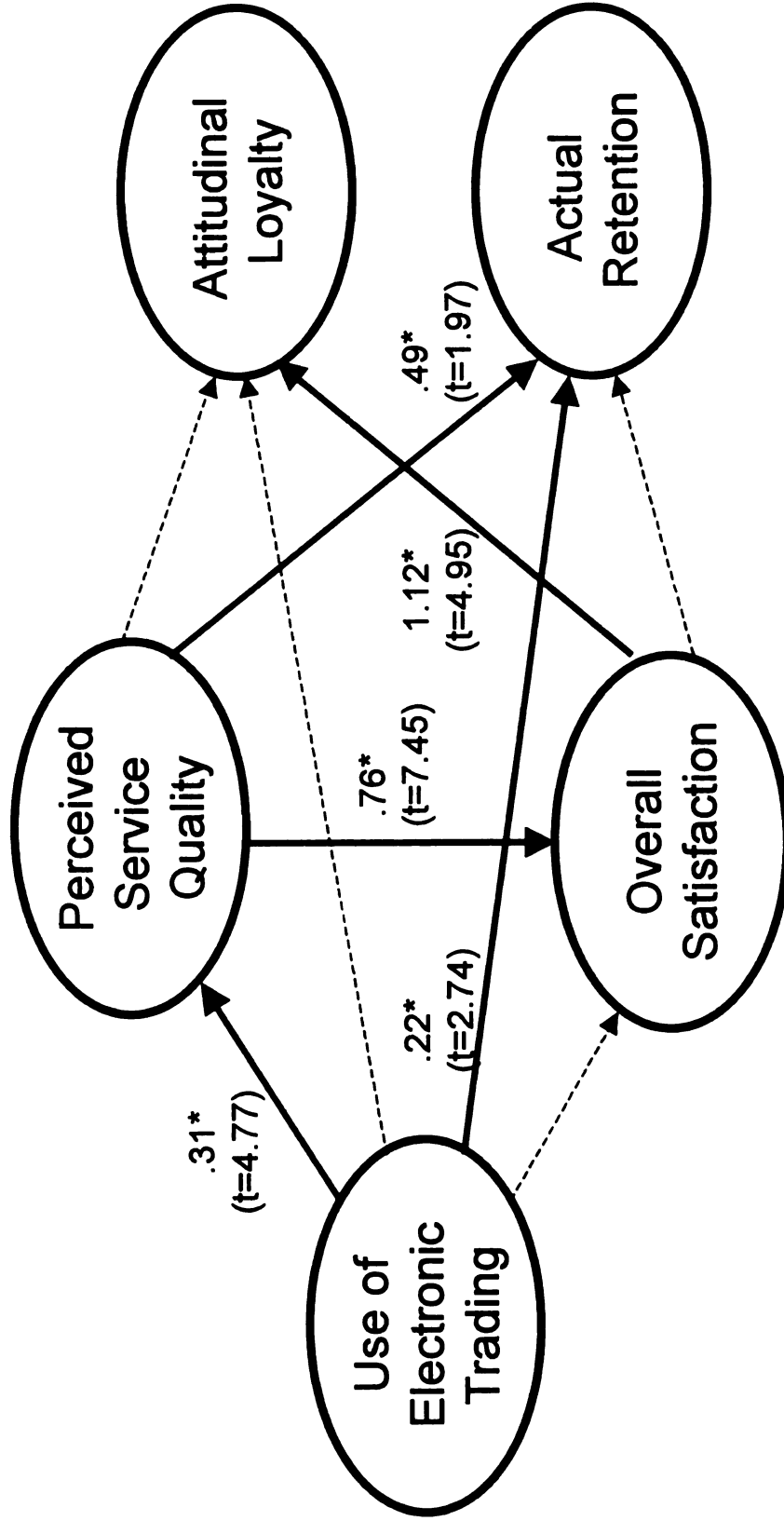
Goodness of Fit
Chi-square = 357.37 (df=161/ *p*< .01)
GFI (Goodness of Fit Index) = .82
CFI (Comparative Fit Index) = .93

→ Significant path (*: *p* < .05)
--→ Insignificant path

CHAPTER 5

DISCUSSION

This chapter extends the discussion of the results reported in Chapter 4, linking the findings back to existing literature. Interpretation would be sought to explain why empirical evidences are or are not consistent with the research hypotheses of the study.

Use of Electronic Commerce in Stock Trading

The current study provides evidence suggesting that electronic commerce for stock transaction is prevalent in Korea and most individual Korean investors are users of electronic stock trading. These findings are consistent with a lot of trade publications reporting that the number of investors who engage in electronic stock trading has increased considerably in the past several years. The growing popularity of electronic stock trading services in Korea is attributable to several reasons including the surging number of Internet users, deregulation, and lower commission rates for electronic stock trading. However, considering the unique circumstances of Korean stock market, there might be another main reason behind the robust growth of electronic stock trading in Korea.

As a matter of fact, the shift from traditional high churn broker managed accounts to more transparent and direct management by individual investors has helped fuel the growth of electronic trading. Traditionally, Korean individual

investors have given brokers autonomy in running their personal accounts. For example, an individual investor would give a broker a sum of money and ask him or her to manage the money, acting as a pseudo-fund manager. Brokers, meanwhile, did not always act in the best interests of the investors and often turned the account over frequently, generating large transaction commissions for the broker and excess costs for the investors. Needless to say, individual investors were frustrated by this practice, but their options were limited. However, the advent of electronic stock trading has changed the dynamics of the individual investor/broker relationship and provided the mechanism by which individual investors are able to avoid the indiscretion of broker managed accounts while exercising greater freedom in their investment decisions.

This fact indicates that electronic commerce can play an important role in solving the problem of moral hazard or opportunism, which has been inherent in a market-mediated exchange between a customer as a principal and a service provider occupying the role of an agent (Singh & Sirdeshmukh, 2000). With the virtue of transparency, defined as the degree of openness about how, where, and when individual investors' transactions are executed (Konana et al, 2000), electronic stock trading provides a countervailing force to constrain the traditional opportunism in Korean stock market.

Conditions for Use of Electronic Commerce

The first part of empirical results of this dissertation has confirmed previous research contentions that use of electronic commerce in stock trading is a

function of several conditions such as personal factors, situational factors and transaction characteristics.

First of all, inconsistent with prior research, personal innovativeness didn't predict use of electronic commerce in stock trading. This finding confirms that electronic stock trading has already entered into the matured adoption stage in Korea. Personal innovativeness might be a strong predictor for any new innovation in early stage of adoption and use.

Second, this study found that investors' knowledge of the stock market, of trading, and of electronic channels is crucial for use of electronic commerce in stock trading. This result confirms previous literature on customer knowledge as a predictor of customers' usage of new information technologies (Li et al., 1999; Konana et al, 2000; Sharma & Bingi, 2000). If customers lack knowledge about stock market and stock trading, they would prefer indirect investment such as mutual fund to direct investment based on their own decision-making. Also, they would like to depend on the recommendation or advice of broker's fund manager. Thus there is less motivation to use electronic stock trading in this case. Furthermore, knowledge about electronic channels including the Internet, computer and other devices are essential for use of electronic commerce in stock trading. Here, the importance of customer education comes out. In order to make computer or Internet illiterate people be electronic traders, the brokers may need to focus on extensive customer education or training programs, in particular through their cyber branches. Otherwise non-electronic investors will be behind

the trend of electronic commerce and experience so-called digital gap in their economic activities.

As expected by the media reports of increasing volumes of electronic commerce, our results suggest that price-sensitive customers are more likely to use electronic commerce for stock transaction. In fact, price sensitivity appeared to be most significant predictor. The most plausible interpretation of this finding is that investors generally use electronic stock trading in order to save the commissions for stock trading in Korea. Thus it can be argued that considerable price difference between online and offline can be a strong driver of customers' use of electronic commerce.

Contrary to expectation, the direct effect of time pressure on use of electronic commerce in stock trading was not supported. This result might come from the characteristics of Seoul area, where the survey was conducted. Unlike small cities or rural areas, the physical branches of stock brokerage firms are almost ubiquitous in Seoul area. People can easily visit the branches, in particular during lunch break. In addition, since most people are users of the wireless telephone service, they can make a call whenever time matters. Thus this result may be changed if the study is replicated in a different setting.

Inconsistent with our hypothesis, our results show that social pressure is not an effective mechanism to influence use of electronic commerce in stock trading. It is because use of electronic trading is beyond the early stage of adoption and most people use it now. Thus social pressure as a predictor of use of electronic trading doesn't work well any more.

One important finding of the study concerns the capacity or speed to access to electronic channels. Our result confirmed the previous studies (Hoag, 1996; Emmanouilides & Hammond, 2000) by indicating that heavy users of electronic trading depend on high-speed access. This finding implies that high usage of electronic commerce is almost impossible without access to a good and fast infrastructure. Investors suffering from a special condition commonly referred to as speed poverty, may be eliminated substantially from the benefits of electronic commerce. Thus the issue of access to electronic channels has become the critical condition for using electronic commerce. Considering the problem of speed poverty or speed gap between information rich and information poor, the establishments of cyber branches in Korea are regarded as very important strategic moves. Investment on cyber branches will make people access to high-speed information infrastructure in spite of their limited personal resources. In addition, the brokerage firms may need to make traditional physical branches be equipped with complementary cyber facilities. The other service providers moving toward electronic commerce should remember that access capacity available to their potential customers is a key condition for rapid adoption and extended usage of their planned electronic commerce system.

The results of the study provide empirical support for our expectation that electronic trading is more used by customers placing orders more frequently. It is because that electronic trading is more convenient and efficient as well as provides bigger savings in terms of transaction commissions. In addition, it is

very hard for the customers placing orders less frequently to justify some personal investments regarding computer equipment or access to the Internet.

Inconsistent with our expectation, there is no evidence supporting that transaction volume in terms of money value can predict use of electronic trading.

The control variables of the study also show that demographic variables predict use of electronic trading according to common sense. Matching with our expectations, use of electronic trading is negatively associated with income. The possible explanation is that high-income people prefer more prestige service or a special treatment by a human contact. In addition, in Korea, male investors appeared to be dominant in using electronic trading.

Impacts of Use of Electronic Commerce

Direct Impacts on Relationship outcomes

The findings of this study are consistent with the much of trade press reports that stock trading is an information intensive business and information technology plays an increasingly significant role in it. Confirming the prior research (Bowen & Hedges, 1993; Heskett et al., 1997), this study showed that electronic stock trading through information technology has emerged as an important attribute in achieving customer relationship outcomes. Indeed, our second set of findings is consistent with the hypotheses that use of electronic commerce in stock trading leads to higher service quality, higher overall satisfaction, higher attitudinal loyalty and higher actual behavioral retention.

First of all, our findings suggest that greater use of electronic trading be associated with higher perceived service quality, which is an important relationship outcome for the brokerage firms. The implication of this evidence on service marketing strategies of continuously provided service providers is that information technology initiatives including electronic commerce efforts should be at the at the heart of customer relationship management. In other words, electronic commerce arrangements should be managed not only from a technical or economic perspective but a defensive perspective of customer relationship management. Moreover, our findings in Korean stock trading industry indicate that use of electronic trading can improve the functional aspects of service quality (how it is done) as well as the technical aspects of service quality (what is done). Thus it is suggested that service providers should try to raise customers' perceptions of service quality by encouraging customers to use new electronic channel of service more. When they initiate electronic commerce movement, they should explore how customers' use of electronic commerce influences on several dimensions of service quality.

Our regression results further provide empirical support for the contribution of customers' use of electronic commerce to overall satisfaction with a service provider. This support is consistent with recent growing service literature showing that electronic commerce leads to higher customer satisfaction (Strader & Shaw, 1997; Ennew & Binks, 1999; Krishnan et al., 1999). This empirical support was significant in Korean stock trading industry because electronic commerce is a

mechanism by which individual investors are able to avoid the broker's indiscretion while exercising greater control in their investment decisions.

According to our regression results, there is also strong evidence supporting the positive relationship between customers' use of electronic commerce in stock trading and their attitudinal loyalty. Since attitudinal loyalty is very important outcome in continuously provided service contexts, this finding has significant implications for managing attitudinal loyalty in service industries. First, based on the strong relationship between use of electronic commerce and attitudinal loyalty, service providers may use electronic customers, who have intentions to maintain ongoing relationship with their service providers, as valuable assets for new marketing strategies. For instance, our results show that heavy users of electronic commerce are more likely to recommend their broker to others. This implies that electronic customers can be more active and powerful opinion leaders for other electronic laggards. Furthermore, it is easier to fuel lucrative word-of-mouth on online world. Considering that it involves no direct costs, this strategy may be the most powerful source for acquiring new customers (Hoffman & Novak, 2000).

In addition, according to our results, there is high possibility for electronic customers to show higher willingness for one-stop shopping. It means that they are more likely to buy additional lines of services or products from the same service provider. This is a positive signal for most service providers coping with the challenge of convergence and diversification. In particular, this is a very significant finding for Korean stock brokerage firms, which are trying to offer more

diversified and advanced online services as well as provide non-financial services such as Internet advertising for banners in future.

Our findings also confirmed a previous research arguing that the result of interactive relationships through electronic commerce may be a higher retention of customers (Duncan & Moriarty, 1998). When it comes to actual behavioral retention, use of electronic commerce again appeared to have strong predicting power. The issue, however, is not whether electronic customers have showed high retention but how long they will show the same outcomes. Thus electronic commerce should be an ongoing process of locking customers in (Vandermerwe, 1999). One possible way for lock-in or so-called electronic stickiness is to increase switching costs on electronic commerce system. Electronic customers may regard the investment in an electronic relationship as a sunk cost, thus disregarding the negative effects of being locked in. Building switching barriers online world make them being locked in to a firm. For example, if customers are accustomed to a unique and original online environment, it is hard to learn and transfer to another system. In addition, other complementary offline strategies such as loyalty program will be needed to lock in electronic customers for long. In summary, electronic commerce strategies accompanying by some good complementary offline strategies can lead to not only reduction in costs but also profitable and sustainable revenue growth (Brown, 2000).

Our regression results also provide empirical support for the interaction effects between social pressure and use of electronic trading, between personal innovativeness and use of electronic trading, and between price sensitivity and

use of electronic trading in predicting actual retention. In particular, in the presence of high social pressure, use of electronic trading appears to enhance actual retention more. This implies that the power of electronic commerce in increasing actual retention may be enhanced when customers are much influenced by social pressure including peer pressure. Thus, in order to achieve higher retention through electronic commerce strategies, it may be important for service providers to make online and/or offline customer community and let customers create word-of-mouth and be influenced by each other (McWiliam, 2000; Zott et al., 2000).

Indirect Impacts on Relationship Outcomes

The results of a structural equation model provide evidence with regard to the mediating role of service quality and overall satisfaction on the effects of use of electronic commerce on customer attitudinal and behavioral loyalty. These findings enhanced our understanding of the different mechanisms underlying the effect of use of electronic commerce and confirmed an important role of electronic commerce in the well-proven service quality-satisfaction-loyalty chain.

The path model revealed service quality had the greatest mediating effect on overall satisfaction and actual retention, which highlights its importance when service providers strive to seek competitive advantage by offering superior service quality and when they adopt a defensive strategy in an attempt to retain customers. The findings indicate that service quality appeared to be a key intervening variable linking the exogenous variable with other outcomes. Thus it

is suggested that electronic commerce efforts should be focused on increasing service quality.

The model also suggested that increased use of electronic commerce leads to increased service quality, to overall satisfaction, and ultimately to attitudinal loyalty. Overall satisfaction appeared to have a limited but still important role to link service quality and attitudinal loyalty.

Our results add to the mounting evidence showing that attitudinal loyalty and actual behavioral retention represent two distinct but related managerial objectives, each requiring a different kind of intervention through use of electronic commerce, service quality and overall satisfaction. In order to achieve loyal customer base, service providers must know how to increase service quality and how to satisfy their customers through electronic commerce efforts. This is a strategic process of moving from use of information technology to use of relationship technology and a process of accelerating customer relationship through information technology including electronic commerce (Swift, 2000).

Impacts of Other Dimensions of Use

Our regression results also showed that offline experience is negatively related to the level of overall satisfaction and attitudinal loyalty. This result implies that the customer base can be thought to comprise two groups of customers: (1) electronic customers who have not switched from traditional channel (the first-time adopters of electronic trading) and (2) those have switched from or stayed with traditional channel. It also implies that differences exist in the sets of

expectations used by two groups and accordingly implies difference in the levels of subsequent outcomes. An understanding of how these customer groups differ in their relationship outcomes might provide crucial insights for designing and implementing effective electronic commerce strategies. For example, the service providers should give the switchers an opportunity to abandon their previous channels based on better benefits from new electronic commerce technologies.

We were surprised to see that greater dependence on the Internet was associated with poorer service quality when execute stock trading. This finding runs counter to the expectation that the use of the Internet is associated with increased service quality. It might because Internet stock trading is still a work in progress in spite of its popularity. It is also possible for many customers to feel still comfortable with proprietary and ad hoc electronic channels. Another reason that use of the Internet was associated with poorer service quality may be problems with security and system failures. While it would be wrong to evaluate the power or potential of the Internet solely on the basis of these results, this study suggests that there should be a lot of room for further exploiting the Internet at least within Korean stock trading industry. However, it is expected that, as more customers become comfortable with the Internet and the Internet-based electronic trading system improves, this medium will lead to higher relationship outcomes.

Electronic customers versus Non-electronic customers

It is clear that electronic commerce in stock trading has already taken off and electronic customers became main streams. Moreover, electronic customers seem to be receptive to the potential benefits offered by electronic commerce. However, it should be noted that there are still some remaining people who need to overcome their reluctance to enter the electronic commerce area including electronic stock trading.

From the firm's perspective, the costs of maintaining electronic commerce system may be lower over long run than using human assistance in the physical environments. Hence, improving customer relationship outcomes with electronic commerce features can be the first priority for the firm's revenue growth and its long-term profits as well (Newell, 2000). However, in moving toward to electronic commerce world, it is important to retain the traditional low-tech, high-touch approach as a viable option for customers (Bitner et al., 2000). In case of the benefits and investments discrimination between online and offline, offline customers are getting less and less served. The danger to the firm of failing to manage the relationships with non-electronic customers proactively is that they may stop using the service, which implies that they have exited from the relationship with the firm, possibly to use another firm's services.

Thus the service providers should be proactive in balancing electronic customers and non-electronic customers. To do so, they need to adopt a segmentation approach, depending upon customers' extent of using electronic commerce because use of electronic commerce is a matter of degree (Newell,

2000). First, according to our results, non-electronic customers or light users of electronic commerce are those with a relatively smaller proportion of their investments with the their service provider. Thus service mangers should examine why they are still reluctant to electronic commerce and need to inform and educate them about the benefits of electronic commerce. Switching offline customers to electronic users can yield attractive prospects for increasing share of portfolio and total revenues. Of course, the minimum investment on the offline branch network should be well maintained. In contrast, electronic customers are those with a relatively larger proportion of their resources already invested with the service provider. It seems that it is a priority to foster increased loyalty among electronic customers and delivering appropriate levels of electronic services for this customer segment. Thus service managers should recognize the explicit attributes of electronic commerce such as features, functions, interfaces, contents or infrastructures that need to be improved to enhance customer relationship outcomes, in particular one-stop shopping outcome. In addition, electronic commerce efforts should be integrated with proper loyalty program.

Finally, the focus on the customers (not technology itself) must be given highest priority in electronic commerce. However, critical issue follows: how can service providers remain in control of customers' access to the channel? From having a dedicated link to their customers through their physical branch networks, service providers are pushed backwards in the online value chain with the danger of losing control of customer access. It is because electronic services are mediated through several intermediaries such as network operators and

Internet access providers or portals. Thus service managers should recognize

that disintermediation and loss of control mean reduced opportunities for

fostering customer relationship outcomes, and develop proper coping strategies

such as strategic alliances with other intermediaries.

Chapter 6

SUMMARY AND CONCLUSIONS

Summary of Findings

This study contributes to the literature on electronic commerce and service relationship marketing by empirically examining the conditions for customers' use of electronic commerce in stock trading and subsequent impacts on customer relationship outcomes in the context of Korean stock trading industry, where electronic trading has already taken off. Through the formulation of research models and testing of hypotheses, this dissertation expands the knowledge regarding the significant conditions in which customers use electronic commerce more, and the influence of customers' use of B-to-C (business-to-consumer) electronic commerce on several important relationship outcomes such as perceived service quality, overall satisfaction, attitudinal loyalty and actual behavioral retention.

With regard to the first goal of this study, we found that customer knowledge, price sensitivity, access capacity, and frequency of order are crucial conditions for customers' use of electronic commerce in stock trading. In particular, customer knowledge and price sensitivity appeared to predict use of electronic commerce most significantly, controlling some demographic variables.

The second goal of this study was achieved by a series of hierarchical regression analyses confirming the positive links between customers' use of

electronic commerce and all of four subsequent relationship outcomes. To a great extent, these links are reinforced by our findings. These findings were in line with the common contention that electronic commerce arrangements might have an important role in increasing customer relationship outcomes.

It was the third goal of this study to identify the dynamic relationships among use of electronic commerce and four relationship outcomes. Partially consistent with the results of regression analyses, the results of a structural equation analysis confirm two of four direct associations between use of electronic commerce and relationship outcomes: 1) use of electronic commerce and service quality, and 2) use of electronic commerce and actual retention. Service quality turns out to play a significant mediating role in predicting the impacts of use of electronic commerce on overall satisfaction and customers' actual retention. Overall satisfaction also appears to play a mediating role with service quality in predicting the impacts of use of electronic commerce on customers' attitudinal loyalty.

Limitations

While it has successfully addressed the proposed hypotheses, as with most research efforts, this study is not without limitations.

One limitation relates to the sampling procedure. This study adopted a customer intercept field survey at the selected branch offices because it was impossible to get a complete customer list for random sampling. Though the sample of this study may not represent the targeted population well, regulation

on customer privacy information necessitated and justified the use of this method as an alternative way of sampling and data collection. Moreover, considering the relatively large number of research variables, the sample size of this study may be a little small and need to be increased.

Another limitation is regarding the cross-sectional design of this study. Since the data was collected at a single point of time, it is only possible to make conclusions regarding the associations among the research variables. Causal linkages and implications could be strengthened with multiple years of measurement of the research variables. This longitudinal approach may be adequate to capture changes in some variables or establish a direction. For example, the strengths of the findings will be enhanced by the use of longitudinal data in trying to predict actual behavioral retention.

The findings of this study are based on a survey of customers, thus measures of use of electronic trading and actual retention are based on their perceptions rather than actual behaviors. In spite of serving as useful proxies, these subjective perceptions are subject to bias and judgment errors. Thus the utilization of objective data would improve the quality of this study.

Finally, the Korean context of this study places limitations on the generalizability of our findings to stock brokerage firms in other national cultures. Nonetheless, this investigation in a non-US scenario does enhance our understanding of the contribution of electronic stock trading to relationship outcomes in other national contexts, and sheds further light on the general benefits of electronic commerce.

Managerial Implications

Several managerial implications emerge from this study. These implications should be of interest to managers in service industries including stock brokerage services industry.

For managers, it is evident that the time has arrived where no brokerage firm can ignore the benefits that a sound electronic commerce system can provide. Thus, it is essential that managers should recognize that electronic commerce strategies lie at the heart of the capability for survival.

In addition, before they commit adequate resources, managers should make sure that electronic commerce strategies produce the desirable outcomes to justify their required investments. They should assess the potential of electronic commerce in producing favorable outcomes when they implement and operate an electronic commerce system. Moreover, managers need to shift a transaction orientation to relationship building in their efforts on electronic commerce strategies. They really need to utilize electronic commerce strategies as a vehicle of relationship marketing as well as a driver of cost savings. The investments for electronic commerce can be only important to service firms to the extent that they influence certain relationship outcomes, such as service quality, overall satisfaction, attitudinal loyalty and actual retention.

In the meantime, managers should integrate high-potential electronic channel within the general channel policy, even if the full content of such a policy will be reorganized by cannibalization of electronic commerce. Instead of taking an extreme position such as pure offline or pure online, offline and online should

not be dissociated. For example, this 'clicks and mortar' hybrid model (Dussart, 2000) can be a winning formula in Korean stock trading industry, where the efforts for building and running cyber branches are prominent. Korean stock brokerage firms provide cyber branches to facilitate customers' use of electronic commerce. These facilities are specifically designed for individual investors who don't have high-speed access to the Internet.

Of course, managers should drastically reconsider their allocation of resources across electronic channel and traditional offline channels based on the relative contributions to various outcomes. Possibly, their allocation of resources may be based on a new market segmentation using use of electronic commerce as a main criterion. For example, if they want to focus on a segment of electronic customers, considering the higher relationship outcomes of electronic customers, more emphases would be placed on electronic channel.

Finally, managers may need to think about how to make their customers adopt and use electronic commerce as a main channel. This study suggests that managers should focus initially on greater customer education or training aiming to increase awareness of electronic commerce and emphasize the benefits of using it. Furthermore, they should create proper strategies to encourage and reward customers for their loyalty through electronic commerce. Loyalty program, which has been long popular in the 'bricks and mortar' world, can be a complementary way of driving higher relationship outcomes.

Implications for Future Research

The results of this study have some implications for the scholars in the field of information technology, electronic commerce and service relationship marketing.

First, they need to put more emphasis on the research evaluating consequences or outcomes of electronic commerce investments. In particular, they need to focus on the powerful role of electronic commerce in creating some desirable customer relationship outcomes in the context of continuously provided services, where customers have repeated interactions with the same service providers.

The attention for further study should be given to identify which specific components or dimensions of electronic commerce, including features, functions, interfaces, contents, and infrastructure, have the strongest impact on relationship outcomes favorable to the service firms. We need a new study examining the appropriate balance to be placed on individual facets of electronic commerce.

In addition, since this study focuses on only Korean stock trading industry in which electronic commerce is prevalent, it would be interesting to compare this study with another study of an industry or country in which electronic commerce is less prevalent or in its infancy. In particular, it would be interesting to see the impacts of electronic commerce on relationship outcomes in the context of continuously provided but hard service sectors, including telecommunication and utility industries, where the main service itself can't be delivered through

electronic networks. Replications to validate the findings of this study under different cultures would be illuminating.

Another possible study will be one examining the asymmetric impacts of use of poor system versus excellent system. It is because electronic commerce system implemented excellently is expected to raise outcomes more than if such is not in place.

Future research may also examine the relationship between customers' use of electronic commerce and the actual benefits to them. For instance, in stock trading context, it will be possible to see the impact of use of electronic trading on the investment performances such as rate of returns and saving in commissions, controlling the influence of market variations.

Finally, it would be interesting to examine the possible reverse association between use of electronic commerce and customer relationship outcomes. It is because increased relationship outcomes may encourage more use of electronic commerce. Moreover, this possible causal linkage should be studied by a longitudinal approach.

APPENDICES

INFORMED CONSENT FORM

This research project will be conducted to meet the requirements for a doctorate in Philosophy in the Mass Media Ph.D. program at the Michigan State University. This project is to examine the impact of electronic commerce on key customer relationship outcomes in the financial service industry.

Your responses to the questionnaire will remain anonymous and will be kept confidential under policies of the Michigan State University. In addition, your privacy will be protected to the maximum extent allowable by law. All reports of research will be aggregated.

You indicate your voluntary consent to participate in this study by completing the questionnaire and returning it. Should you have any questions about the study or the questionnaire, please contact Seongcheol Kim (phone: 1-517-353-1749, E-mail: kimseon1@msu.edu) or Dr. Charles Steinfield, Professor of the Department of Telecommunication, Michigan State University (phone: 1-517-355-4451, E-mail: steinfie@msu.edu).

If you have questions about your rights as a human subject of research, please contact Dr. David Wright, Chair of the University Committee on Research Involving Human Subjects (Phone: 1-517-355-2180, E-mail: UCRIHS@msu.edu).

Thank you. We greatly appreciate your voluntary assistance in this study.

APPENDIX B

SURVEY INSTRUMENT

Questionnaire # _____

(SECTION ONE: Use of Electronic Trading)

Instruction: This survey is to examine the impact of electronic trading on customer relationship outcomes. This questionnaire is targeted for the current customers of S-Securities Corp. and L-Securities Corp. There are no right or wrong answers. Please answer for each question.

1. Are you a current customer of this broker?

Yes_____, No_____

If you answer "no" in question 1, please quit. Otherwise please go ahead.

2. How long have you been a customer of this broker? _____

1) Less than 6 months
2) More than 6 months and less than 1 year
3) More than I year and less than 2 years
4) More than 2 years and less than 3 years
5) More than 3 years

3. It this company your primary broker?

Yes_____, No_____

4. Do you have additional accounts in other brokers?

Yes_____, No_____

If yes, how many additional brokers do you use? _____

5. On average, how many orders do you make in a week? _____

    1) 1 or less
    2) Between 2 and 3
    3) Between 4 to 6
    4) Between 7 to 10
    5) 11 and more

6. How many times do you make non-order interactions with your broker in a week through Web site, phone or branch office? _____

    1) 1 or less
    2) Between 2 and 3
    3) Between 4 to 6
    4) Between 7 to 10
    5) 11 and more

7. How many stocks you do have in your portfolio? _____

    1) Only 1
    2) 2
    3) 3
    4) 4
    5) 5 and more

8. What is the total value of your current investments in stocks? _____

    1) Less than $5,000
    2) Between $5,000 and $9,999
    3) Between $10,000 and $19,999
    4) Between $20,000 and $29,999
    5) $30,000 and more

9. Do you have a proper cyber account in this broker to doing electronic trading for stock transaction?

    Yes_____, No_____

10. If you check "yes" in question 9, did you have an active account and make transactions through this broker before you was involved in electronic trading?

Yes_____, No_____

11. Is electronic trading your primary way of making stock transactions?

Yes_____, No_____

12. If you answer "no" in question 11, what is your primary way of making stock transactions? _____

1) By phone
2) By face-to-face at branch office
3) Others _____

13. How long have you been using electronic trading? _____

1) Less than 6 months
2) More than 6 months and less than 1 year
3) More than I year and less than 2 years
4) More than 2 years and less than 3 years
5) More than 3 years

14. How often do you use the electronic trading? _____

1) At least several times in a day
2) At least daily
3) At least weekly
4) Less frequently than weekly
5) At least monthly or less

15-16. Please indicate what percent of your stock transactions was made through electronic trading during last six months.

15. What percent of your total number of orders was made through electronic trading during last six months?

0) None
1) Between 1% and 20%
2) Between 21% and 40%
3) Between 41% and 60%
4) Between 61% and 80%
5) Between 81% and 100%

16. What percent of your total $value of orders was made through electronic trading during last six months?

0) None
1) Between 1% and 20%
2) Between 21% and 40%
3) Between 41% and 60%
4) Between 61% and 80%
5) Between 81% and 100%

17. Please describe your usage of each method for electronic trading.

1) Through the Internet (Web trading) _____%
2) Through the Internet (HTS - home trading system) _____%
3) Through wireless PDA _____%
4) Through ARS _____%
5) Other _____%

18-19. Please indicate what percent of your stock transactions was made through this broker during last six months.

18. What percent of your total number of orders was made through this broker during last six months?

0) None
1) Between 1% and 20%
2) Between 21% and 40%
3) Between 41% and 60%
4) Between 61% and 80%
5) Between 81% and 100%

19. What percent of your total $value of orders was made through this broker during last six months?

0) None
1) Between 1% and 20%
2) Between 21% and 40%
3) Between 41% and 60%
4) Between 61% and 80%
5) Between 81% and 100%

Instruction: Using a five point scale where "5" is very important and "1" is not at all important, please tell how important the use of electronic trading for each of three separate functions in stock trading.

20. For communication with your primary broker (i.e., information gathering, feedback, complaints and so on)

(Not at all important)   1   2   3   4   5   (Very important)

21. For transaction with your primary broker (i.e., account set-up, negotiation, order and so on)

(Not at all important)   1   2   3   4   5   (Very important)

22. For distribution of service from your primary broker (i.e. money transfer, payment and so on)

(Not at all important)   1   2   3   4   5   (Very important)

(SECTION TWO: Customer Relationship Outcomes)

Instruction: The following section is to ask your current evaluation on your broker. There are no right or wrong answers. Please circle a number that represents your answer best for each statement. Circling 5 means that you strongly agree with the statement, and circling 1 means that you strongly disagree.

23. This broker provides consistent and dependable performance.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

24. This broker provides its services at the time it promises to do so.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

25. This broker insists on error-free records and accurate bills.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

26. This broker's service is easily and conveniently accessible.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

27. This broker responds promptly to customers' requests.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

28. This broker gives customers personalized and individualized attention.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

29. This broker educates customers along the way so they can make more informed decisions.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

30. This broker provides enough opportunity to interact with this broker and/or other customers.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

31. This broker charges competitive commission rates.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

32. I feel that this broker manages my account in a good way.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

33. I am delighted with my overall relationship with this broker.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

34. I wish more of my suppliers were like this broker.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

35. I am very committed to continue the relationship with this broker.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

36. Maintaining a long-term relationship with this broker is very important to me.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

37. I would recommend this broker to someone who seeks my advice.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

38. I say positive things about this broker to other people.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

39. I gladly encourage friends and relatives to do business with this broker.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

40. I will consider this broker as the first choice if I buy new financial service or product.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

41. I am willing to do buy other financial services through this broker.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

(SECTION THREE: Personal and Situational Factors)

Instruction: Please circle a number that represents your answer best for each question. Circling 5 means that you strongly agree with the statement, and circling 1 means that you strongly disagree.

42. If I heard a new information technology, I would look for ways to experiment with it.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

43. Among my peers, I am usually the first to try out new information technologies.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

44. To make stock transactions, I need to use every available minute effectively.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

45. It is difficult to allocate some time during day for visiting this broker to make financial transactions.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

46. I use electronic trading because I am motivated from my peers' use.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

47. I believe that electronic trading is associated with high social status.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

48. I feel that electronic trading is the current social trend.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

49. I use electronic trading to take advantage of low prices.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

50. I am very concerned about low prices.

(Strongly disagree)   1   2   3   4   5   (Strongly agree)

Instruction: Please circle a number that represents your answer best for each question. Circling 5 means that you know a lot, and circling 1 means that you don't know well.

51. To what extent do you know about stock trading?

(Do not know)   1   2   3   4   5   (Know a lot)

52. To what extent do you know about electronic channels including the Internet?

(Do not know)   1   2   3   4   5   (Know a lot)

Instruction: Please provide the following information.

53. What speed or access capacity in your computer used for electronic trading or other things? _____

   1) 9600 bps or less
   2) 14400 bps
   3) 28800 – 33600 bps
   4) 56000 bps
   5) High speed (Cable modem, ADSL or LAN)

(SECTION FOUR: General Information)

Instruction: Please provide the following information.

54. How old are you? _____

    1) Younger than 25
    2) Between 25 and 29
    3) Between 30 and 39
    4) Between 40 and 49
    5) 50 or older

55. What is your marital status?

    Single _____, Married _____

56. What is your gender?

    Female _____, Male _____

57. What is your employment status? _____

    1) Unemployed
    2) Homemaker
    3) Student
    4) Part-time employee (less than 30 hours per week)
    5) Full-time employee (30 or more hours per week)

58. If you are employed, what is your job title? _____

    1) Plain worker
    2) Assistant manager
    3) Manager
    4) General manager
    5) Executive or higher

59. What is the level of education you have completed to date?

    1) High school graduate or less
    2) Attended college
    3) Graduate 2-year college
    4) Graduate 4-year college
    5) Postgraduate work degree

60. What is your approximate total income from all sources last year (1999)?

    1) Under $15,000
    2) Between $15,000 and $29,999
    3) Between $30,000 and $44,999
    4) Between $45,000 and $59,999
    5) $60,000 or more

Thank you very much for participating in our study. Now please return your completed questionnaire and take a gift for you.

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