Antecedents and Consequences of Service Quality in Online Banking: An Application of the SERVQUAL Instrument

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INTRODUCTION

During the past decade, the online service industry has witnessed tremendous growth, much of it spurred by the Internet revolution (Keaveney and Parthasarathy, 2001). Especially, the potential of the Web as a commercial medium is widely recognized and the growth in online service industries such as online banking has increased rapidly. In addition to Internet companies, traditional organizations are investing a huge amount of money and effort in information systems to provide online services through the Web. The underlying assumption of their investment is that, because online services provide their customers with convenience, interactivity, relatively low cost, and a high degree of customization/personalization, they will enhance customer satisfaction and retention more effectively than offline-based services (Khalifa & Liu, 2001). To justify their investment in online services, many organizations are trying to measure the quality of their online services and investigate the relationships between service quality and customer satisfaction. However, a formal methodology for measuring online service quality is not well developed yet.

Traditionally, many studies of service marketing have tried to define service quality and develop instruments to measure it. Since Parasuraman et al.(1988) introduced a service quality instrument, called SERVQUAL, many studies have used SERVQUAL to measure service quality in various domains, ranging from financial services (Lin, 1999), health services (Dean, 1999), travel agent services (Kaynama, 2000), and retailing services (Mehta, 2000), to restaurants (Lee and Hing 1995). However, since SERVQUAL was originally developed to measure service quality delivered through regular offline channels, its use in the Information System (IS) domain could be somewhat problematic (Van Dyke et al., 1999). Recently, a few studies have begun investigating the suitability of SERVQUAL in assessing the quality of online services (Gefen & Devine, 2001).

The main objective of this study is to investigate the usefulness and applicability of SERVQUAL in measuring online service quality and its relationships to customer satisfaction and customer retention. By exploring the suitability of SERVQUAL and the outcome of service quality, this study enhances understanding of the causal relationships among service quality, customer satisfaction, and customer retention, in the context of online banking services.

THEORETICAL BACKGROUNDS

Online Banking

Internet has emerged as a key competitive arena for the future of financial services (Cronin, 1998) in that online banking offers customers more features with lower cost than traditional banking activities. Since the Security First Network Bank (SFNB) first started its Internet bank on the web site (www.SFNB.com), more than 1,500 financial institutions have made plans to offer certain forms of Internet banking in 3 years. Advanced technologies enable banks to utilize new banking products, such as a smart card and electronic money, through the Internet. Internet banking is easier, more convenient and offers more features with lower cost than home banking in the 80's. Customers' responses to the Internet banking system have been so much different from the home banking due to its easy accessibility. Customers can access their account from anywhere in the world and at any time. To secure loyal customers, many banks try to provide customers with unique online experiences that customers cannot access through the offline channels. Considering that enormous capital investment is needed for developing these online banking services, it is very critical for them to measure the service quality produced by online banking systems.

Service Quality

Service quality is generally perceived to be a tool that can be used to create a competitive advantage and therefore, substantial research into service and service quality has been undertaken in the last 20 years. Bitner et al. (1990) define service quality as "the consumers' overall impression of the relative inferiority/superiority of the organization and its services." The most common definition of service quality is the discrepancy between consumer's expectations and perceptions of the service received. Accordingly, service quality is defined as how well a delivered service level matches customer's expectation. Parasuraman et al. (1988, 1991) identified more detailed dimensions of service quality and developed a well-known instrument, called SERVQUAL, to measure customer's perceptions and expectations from service. The SERVQUAL instrument consists of five underlying dimensions, with two sets of 22 item statements for the 'expectation' and 'perception' sections of the questionnaire. Perceived service quality is measured by subtracting customer perception scores from customer expectation scores, both for each dimension and overall. The five dimensions of SERVQUAL are (Parasuraman et al., 1988, 1991):

(1) Tangibles, which pertain to the physical facilities, equipment, personnel and communication materials.
(2) Reliability, which refers to the ability to perform the promised services dependably and accurately.
(3) Responsiveness, which refers to the willingness of service providers to help customers and provide prompt service.
(4) Assurance, which relates to the knowledge and courtesy of employees and their ability to convey trust and confidence.
(5) Empathy, which refers to the provision of caring and individualized attention to customers.

Since the SERVQUAL was developed in 1988, various researchers have recognized that both the instrument itself and the conceptualization of service quality may benefit from further refinement (for example, Finn and Lamb 1991, Lee and Hing 1995). They have argued that the SERVQUAL instrument needs to be customized to the specific service area. Cronin and Taylor (1992) have developed instruments to measure service quality based only on customer perceptions. After many studies have examined the suitability of SERVQUAL in measuring service quality in different types of service, they tried to adapt the original SERVQUAL items to various service contexts by slightly changing the original items.

[1]This research was supported by the research fund of Hanyang University.

Online Service Quality

During the past several years, some conceptual and empirical studies have attempted to address the key attributes of service quality directly or indirectly related to online service and, SERVQUAL has been widely accepted and used in measuring Information System service quality (Van Dyke et al., 1999). Yang & Jun (2002) redefined the traditional service quality dimensions in the context of online services, and suggested an instrument consisting of seven online service dimensions (reliability, access, ease of use, personalization, security, credibility, and responsiveness). In addition, Barnes & Vidgen (2002) introduced a method for assessing the service quality of e-commerce web-sites, called WebQual. Many studies, including these two, have introduced a variety of instruments without testing the suitability of SERVQUAL as an online service measure. The objective of this study is to explore the suitability of SERVQUAL in the context of online banking services, and examine the relative importance of the service quality dimensions of SERVQUAL to overall customer satisfaction and retention.

RESEARCH HYPOTHESES

The growing importance of service quality leads us to examine the following questions concerning the relationships among service quality, customer satisfaction, and customer retention in the online banking service area.

- Is service quality significantly associated with customer satisfaction?
- Does the level of service quality influence customer satisfaction, and increase the level of customer retention?

Mummalaneni and Wilson(1989) argue that satisfaction leads to binding the customer and the seller together and strengthening their relationship. Once a customer has decided that he or she is no longer satisfied with the product or service, the process of the dissolution of the bonding between the customer and the provider becomes salient. Also, there is widespread consensus among scholars (e.g. Wilson, 1995) that greater satisfaction increases the level of a customer's commitment to the seller. Recently, in the information system area, some researches began to try to investigate the relationship between web site quality and customer satisfaction. For example, McKinney et al. (2002) found that Web-customer satisfaction is determined by the nine quality-related constructs. In a study of electronic commerce channel preference, Devaraj et al. (2002) also showed that service quality is one of the major determinants of consumer satisfaction.

One of the key issues for online service providers as a result of the increased competition is "churn," or customer movement to the competing company. Therefore, how to increase the level of customer retention has been one of the key questions to most marketing managers in the online service industry. Some marketing researchers have showed that customer satisfaction is the key factor for determining the service switching intentions (Keaveney and Parthasarathy, 2001). Using data on the online industry, Chen and Hitt (2002) investigated how service characteristics affect the level of customer switching and retention. Similarly, Zeithaml, Berry, and Parasuraman (1996) emphasize the importance of measuring future behavioral intentions of customers to assess their potential to remain with or leave the service organization. On these grounds, we have the following research hypotheses regarding service quality, customer satisfaction, and customer retention.

H1: Service quality of online banking is positively related to the level of customer satisfaction.

H2: Customer satisfaction is positively related to the level of customer retention.

H3: Service quality of online banking is positively related to the level of customer retention.

RESEARCH METHOD

Research Design and Sample

Prior studies (Kettinger & Lee, 1994, Van Dyke et al., 1997) empirically tested whether SERVQUAL is an appropriate instrument to assess IS (Information System) service quality. In this study, online-bank-adapted SERVQUAL was designed to deal with the unique features of online banking services. The basic methodology was to apply the modified SERVQUAL instrument to the study sample, and then validate the measurement model and structural equation model. The relationships among service quality, customer satisfaction, and customer retention were also investigated and the research hypotheses were tested.

Data for model testing were obtained through an online survey. With the help of one of the major commercial banks in Korea, a survey was administered via the bank's website. From the perspectives of the five dimensions of SERVQUAL, the survey measured user expectation for the online bank in general and perceived performance of the online bank. The appendix shows the questionnaire items used in the survey. In all, 740 responses were used for the statistical analysis and model testing.

Data Purification

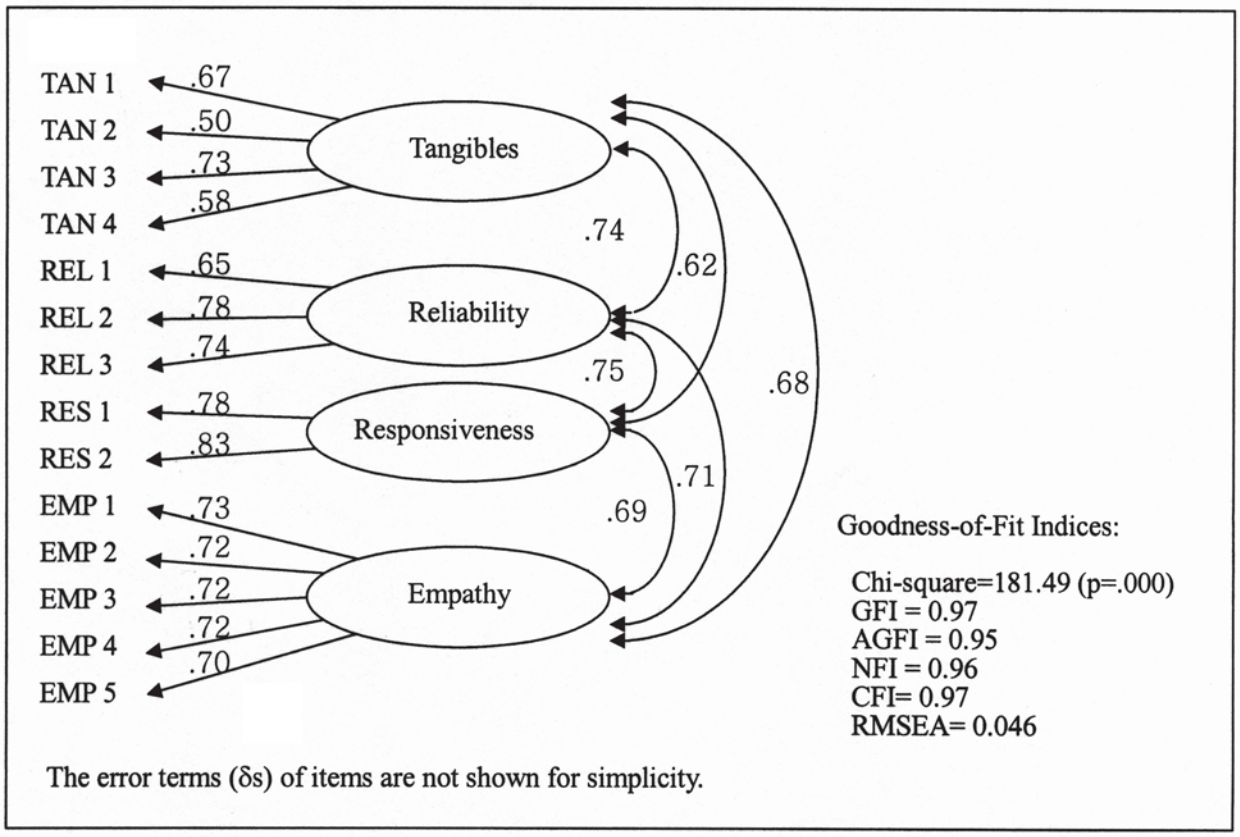
In this research, we followed the updated measure development paradigm proposed by Gerbing and Anderson (1988) as well as the traditional procedure suggested by Churchill (1979) to develop better measures of marketing constructs. Exploratory factor analysis (EFA) was conducted for data screening and dimensionality check. Nine items were dropped after the EFA procedure because they are cross-loaded onto more than one factor. The measurement items of the 'assurance' dimension were not properly loaded resulting in the complete deletion of this dimension. Therefore, four dimensions of SERVQUAL, Tangibles, Reliability, Responsiveness, Empathy, were used for the final analysis. As one of the major problems of SERVQUAL, Van Dyke et al. (1997, 1999) pointed out the dimensional instability of SERVQUAL. The service quality factors or dimensions originally defined by Parasuraman et al. (1991) have not emerged as such in subsequent researches. Especially, past research has shown that the Information Service(IS)-context-modified version of the SERVQUAL instrument produced four dimensions (Kettinger and Lee, 1994).

In this study, the assurance dimension of SERVQUAL was dropped in the context of online banking. One possible explanation for this result can be found from the unique features of online services. Instead of interacting with IS personnel or systems through offline channels, online service users heavily rely on the non-human interface of banking services. Consequently, customers' evaluations for service quality are mainly influenced by the features and the security of online bank web sites. In other words, in online banking, customers would not accurately evaluate the assurance dimension of SERVQUAL which is defined by the knowledge and courtesy of administrators. Instead, they are more concerned about the security of their financial transactions and, therefore, reliability would be the most representative dimension of service quality.

Measurement Model and Second Order Confirmatory Factor Analysis

In an effort to achieve reliability and validity of the measurement model, first-order and second-order confirmatory factor analy-

FIGURE 1
First Order Model of Online Banking Service Quality



sis (CFA) were conducted for the four-dimensional model of SERVQUAL using gap scores calculated from the 14 pairs of items, and this produced satisfactory results.

Figure 1 and Table 1 illustrate the estimated parameters of the four-construct, first-order factor model. As shown, the indicator loadings of items to their respective constructs are strong. The t-scores range from 11. 37 to 19.46, indicating that all factor loadings are significant and providing evidence to support the convergent validity of the items measured (Anderson and Gerbing 1988). Composite reliability, a measure of internal consistency comparable to coefficient alpha (Fornell and Larcker 1981), is in excess of 0.70, implying acceptable level of reliability for each of constructs. As also illustrated in Figure 1, the first-order constructs exhibit a moderate amount of correlation among themselves. To assess the degree of these associations, a formal test of discriminant validity was conducted by using chi-square difference test. This suggests that the better model will be the one in which the two constructs are viewed as distinct, yet correlated, factors (Anderson and Gerbing 1988, Bagozzi el al. 1991). In all six paired comparisons, the chi-square difference test was significant, suggesting that the constructs are distinct. Figure 2 illustrates the structure and estimated parameters of the second-order factor model of online banking service quality. Consistent with the first-order model, the items show strong measurement properties. The paths from the second-order factor of service quality to the first-order dimensions are strong and significant. Hence, we conclude that the higher-order concept of the service quality of online banking seems to be well represented by a second order factor model. In sum, all these diagnostics suggest that the measurement model of online banking service quality should be accepted as a good representation of the data.

Structural Model and Hypotheses Testing

To test the research hypotheses and investigate the relationships among online service quality, customer satisfaction, and customer retention, we conducted covariance structure analysis by using LISREL 8. The final structural model of online banking service was tested and, as seen in Figure 3, the results showed that service quality has positive impact on customer satisfaction (b=0.41) and that customer satisfaction increases the level of customer retention (b=0.80) accordingly. Therefore, research hypotheses 1 and 2 were supported with strong statistical significance. However the direct impact of service quality on the level of customer retention was not statistically significant and hypothesis 3 was not supported. This means that service quality influences customer retention level indirectly through the level of customer satisfaction. Some researches have suggested that customer satisfaction is an antecedent factor of service quality (Bolton and Drew 1991). However our research model indicates that this may not be the case and provides the empirical support for the notion that service quality in fact leads to customer satisfaction and, furthermore, an increase in customer retention. This confirms the recent results of Keaveney and Parthasarathy (2001) that online service continuers show a higher satisfaction level than online service switchers. Cronin and Taylor (1992) also showed that service quality influences customer satisfaction, even though they measured service quality with perception only.

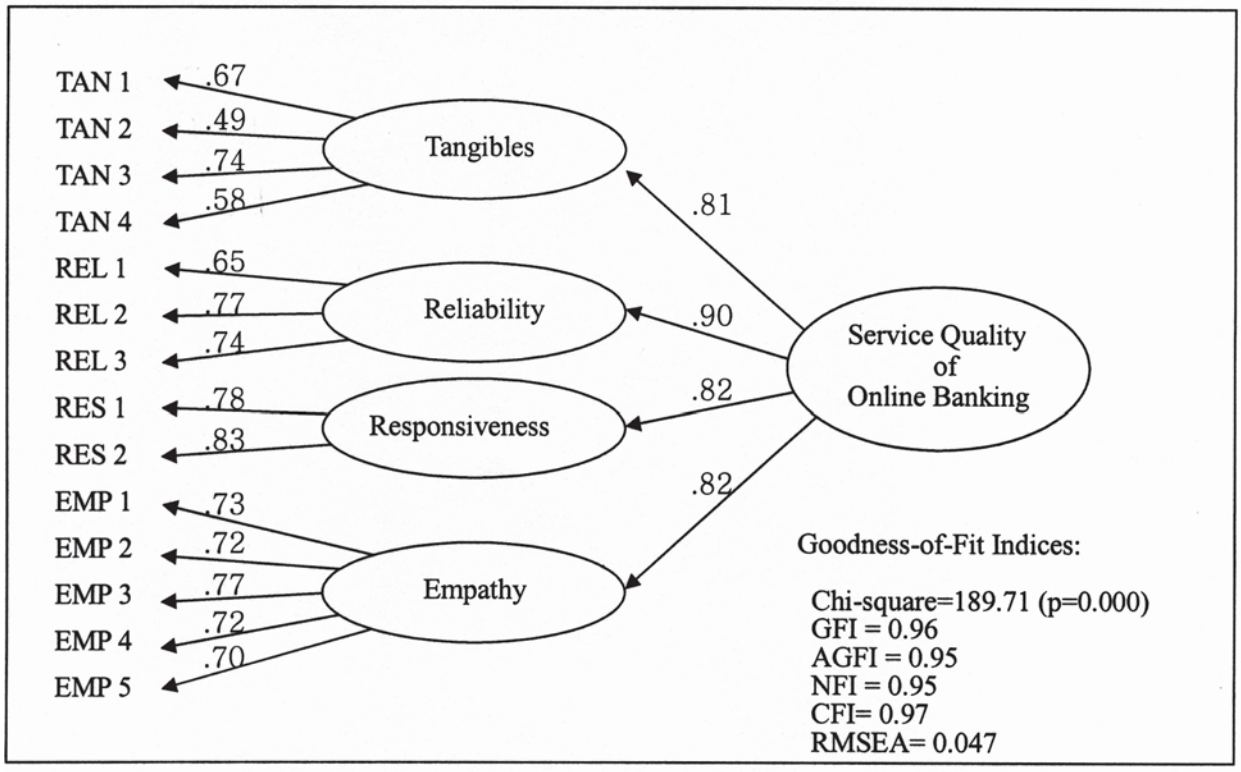
The results of model testing showed satisfactory goodness-of-fit indices. In general, the goodness-of-fit was high (GFI=0.94) indicating that a major proportion of the variances and covariances in the data was accounted for by the model . More specifically, the root mean square error of approximation (RMSEA=0.046) is below

TABLE 1
Properties of Measurement Model of Online Banking Service Quality

Construct Item	Standardized Loading	t- value	Composite Reliability	Cronbach' s Alpha
Tangibles			0.72	0.72
Q1	0.67	-		
Q2	0.50	11.37*		
Q3	0.73	15.34*		
Q4	0.58	12.93*		
Reliability			0.78	0.76
Q5	0.65	-		
Q6	0.78	16.59*		
Q7	0.74	16.17*		
Responsiveness			0.79	0.78
Q10	0.78	-		
Q11	0.83	19.12*		
Empathy			0.85	0.85
Q18	0.73	-		
Q19	0.72	18.36*		
Q20	0.77	19.46*		
Q21	0.72	18.37*		
Q22	0.70	17.79*		

* Indicates significance at p<0.01 level.

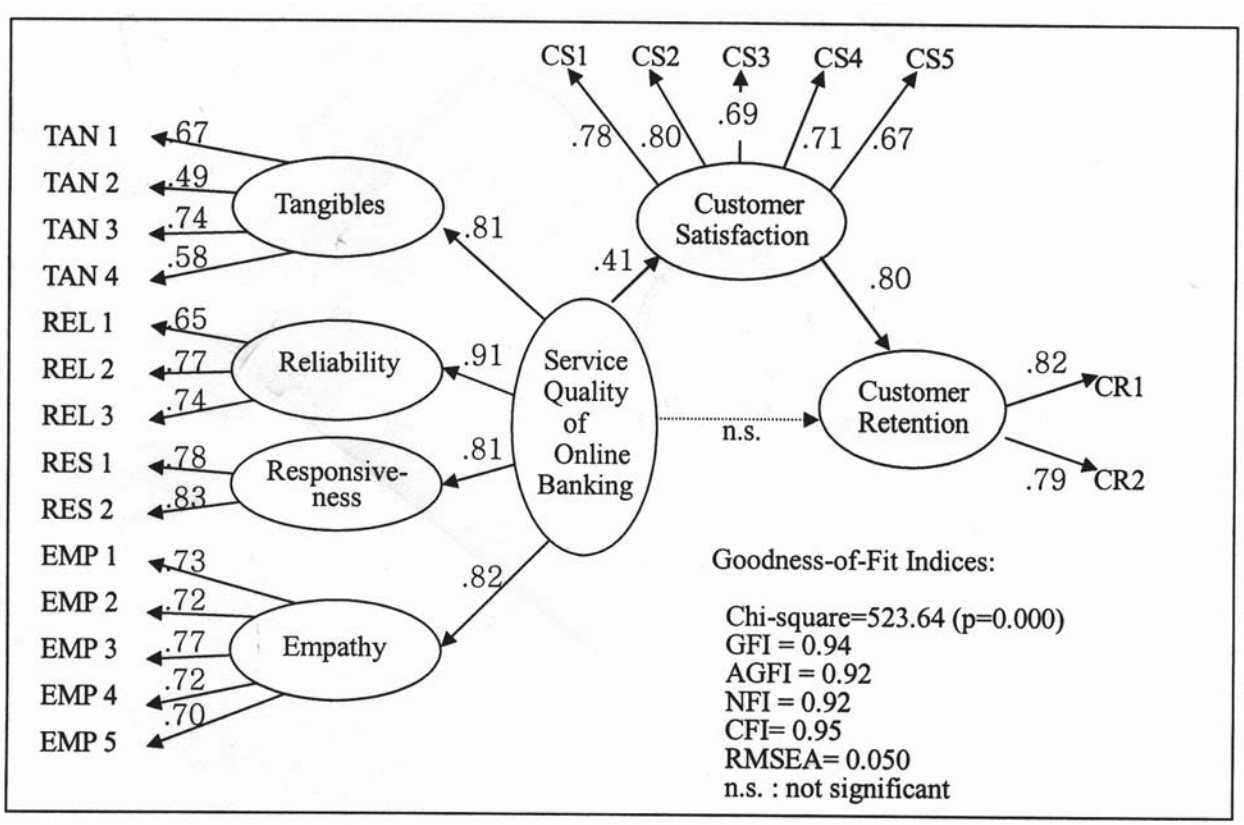
FIGURE 2
Second Order Model of Online Banking Service Quality



the .08 cutoff recommended in the literature (e.g. Browne & Cudeck 1993). The adjusted GFI and other fit indices (AGFI=0.92, NFI=0.92, NNFI=0.95, CFI=0.95) clearly meet the requirements recommended in the literature (Bagozzi and Yi, 1988, Baumgartner and Homburg, 1996) and these magnitudes indicate that the model fits the data adequately.

Finally, to make sure of the order condition of the causal structure of service quality, satisfaction, and retention, we analyzed

FIGURE 3
Structural Model of Service Quality, Customer Satisfaction, and Customer Retention



other alternative models. For example, we examined the direct effect of service quality on customer retention without including customer satisfaction in the model. We also ran the model where the effects of satisfaction are mediated by customer retention. Testing all these alternative models did not violate the causal structure of the proposed model and we accepted this as a final model.

Conclusions and Implications

Many studies have emphasized the need to develop valid and reliable measures of the quality of Information System (IS) service. Most of them have made much efforts to apply SERVQUAL, a commonly used measure of service quality, to IS-specific environments. They have introduced the IS-adapted SERVQUAL, and examined its usability in different IS settings. Since many companies have heavily used the Internet to interact with their business partners and customers, the online service quality that they provide has become a primary concern in Internet business area. We introduced the modified version of the SERVQUAL instrument for online banking and, from the exploratory and confirmatory factor analysis, our study suggested a four-factor model of SERVQUAL including Tangibles, Reliability, Responsiveness, and Empathy. Furthermore, we explored the relationships among customer satisfaction, customer retention, and service quality. This study reveals that SERVQUAL is an appropriate instrument for measuring the quality of online banking services.

The results from the present study suggest several implications for the use of SERVQUAL in the online banking area. This study has the potential to make theoretical, managerial, and methodological contributions to the analysis of service quality. Theoretically, we attempted to investigate the causal relationships among service quality, customer satisfaction, and customer retention. As seen in the Figure 3, the level of service quality has positive impact on customer satisfaction and, the level of customer satisfaction influences the level of customer retention accordingly. Against the study of Bolton and Drew (1991), our study shows that service quality is an antecedent factor of customer satisfaction and retention. It is an interesting finding that service quality does not directly influence the level of customer retention. Managerially, this research provides company managers with a scale to assess the quality of their service from the perspective of the four underlying dimensions. This study also provides marketing managers, especially in the online banking area, with an insight to understand how to increase customer retention level. Methodologically, this research attempted to examine the suitability of SERVQUAL to measure the service quality in the online banking area. The assessments of reliabilities and validities of SERVQUAL through LISREL analysis confirm the correspondence rules between the empirical and theoretical concepts (Bagozzi 1984). These methodological attempts and the purified measurement items of the study will provide a valuable guidance to the future empirical research into online service quality.

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APPENDIX

Questionnaire Items of Online Banking Service Quality

Dimension	Item (Performance items only)
Tangibles	Q1) XYZ online bank has up-to-date equipment & technology. Q2) The web-site of XYZ online bank is visually appealing. Q3) The web-site of XYZ online bank makes you find information easily. Q4) The web site of XYZ online bank provides you with valuable information. Q4-1)* The web site of XYZ online bank is easy to use and navigate.
Reliability	Q5) When XYZ online bank promises to do something by a certain time, it does so. Q6) When there is a problem, XYZ online bank shows a sincere interest in solving it. Q7) XYZ online bank performs the service right first time. Q8)* XYZ online bank provides its services at the time it promises to do so. Q9)* XYZ online bank insists on error-free records.
Responsiveness	Q10) Administrators of XYZ online bank tell you exactly when the service will be performed Q11) Administrators of XYZ online bank give you prompt service. Q12)* Administrators of XYZ online bank are always willing to help you. Q13)* Administrators of XYZ online bank are never too busy to respond to your questions.
Assurance	Q14)* Administrators of XYZ online bank show the confidence in customers. Q15)* You feel safe in your transactions with XYZ online bank. Q16)* Administrators of XYZ online bank are consistently courteous with you. Q17) *Administrators of XYZ online bank have the knowledge to answer your questions
Empathy	Q18) XYZ online bank gives you individual attention. Q19) Help desks or call centers of XYZ online bank have operating hours convenient to all its customers. Q20) Help desks, call centers, and web administrators of XYZ online bank give you personal attention. Q21) Help desks, call centers, and web administrators of XYZ online bank have your best interests at heart. Q22) Help desks, call centers, and web administrators of XYZ online bank understand your specific needs

* These items were deleted in the final analysis.

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