

Measuring service quality of online banking in China

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ABSTRACT

Objectives of study:

The objective of this thesis is to develop a multiple item scale for measuring service quality of online banking in Bozhou City, Anhui Province, China. Briefly speaking, the first theoretical objective of this study is to discuss concept e-service quality as well as related e-service quality models, especially E-S-QUAL/E-RecS-QUAL (Parasuraman et al. 2005). The second objective is to define and establish one suitable multiple e-service item scale for China with the help of E-S-QUAL/E-RecS-QUAL model and other related models. The objective of empirical part is to get the refined measurement scale for online banking service through data collection and analysis in Bozhou City, Anhui Province, China.

Academic background and methodology:

Service quality plays an important role as competitive weapon and a significant differentiator for many service organizations (Parasuraman & Zeithaml, 1988), involving e-banking industry. According to Wang et. al (2003), good e-service quality offering is the key issue to survive in the intensively competitive banking market, especially maintain customer satisfaction. As a result of this phenomenon, a good understanding of service attributes that customers use to evaluate online banking service quality is needed for banks so that the performance of e-service is able to be monitored and immediate adjustments and improve can be done as soon as possible.

In this study, an overview of service quality (including e-service quality) and related literature is discussed, especially in the context of online banking industry that is taken as the case subject. Moreover, the study adopts E-S-QUAL/E-RecS-QUAL scale (Parasuraman et al. 2005) to establish a suitable multiple e-service item scale for measuring online banking in China. The target group for this study is limited to young and middle aged people between 19-39, e.g. university students etc. Survey sending and gathering is chosen as data collection for this thesis.

Findings and conclusions:

Through the process of data collection and factor analysis in the empirical part, the refined scale for measuring online banking in China was identified, involving 3 dimensions and 14 items: customer service, privacy and preferential and reliable treatment. This finding indicated that the dimensions and items from E-S-QUAL/E-RecS-QUAL needed to be reorganized and reinterpreted for measuring online banking in Bozhou City of China.

Key words: online banking, service quality, E-S-QUAL/E-RecS-QUAL

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1. INTRODUCTION

1.1. Background information

One of the technologies in 21st century that has brought changes almost in every aspect of our life is digital revolution. With the rapid development and wide application of modern information and communication technology, the power of internet and World Wide Web is becoming increasingly significant in our daily life. Nowadays, more and more people prefer to use self-service technology rather than traditional services because internet technology can bring convenience and save time. Speak distinctly, but without exaggeration, internet technology is considered to be the third innovation wave after the first two revolutions: agricultural and industrial revolution (Khan & Mahapatra*, 2009). Needless to say, we have stepped into the era of information economy. Specifically speaking, e-commerce is the main and popular form existing in growing industry of 21st century (Kenova V. and Jonasson P. 2006).

With the rapid development of e-commerce in the era of internet-based network economy, banks have established new services and expanded more accessible business online, namely online banking which is following information economy trend. In fact, since the first online banking service was established by Stanford Federal Credit Union (SFCU) in October 1994 (Business Wire, 1995), online banking has spread rapidly and became popular around the world. As time goes by, online banking services have been carried out in many banks of China, such as four representative state-owned banks: Bank of China, Agricultural of China, Industrial and Commercial Banks of China Ltd. and China Construction Bank etc. In the past few years, the popularity of online banking has been increased all the time, especially in China. As known to us all, online banking has been developed for around 10 years with rapid growth of internet banking users. According to the figure shown from Enfodesk, during the fourth quarter of 2010, China's online banking market turnover has reached 173.70 trillion RMB (Yuan), an increase of 17, 6% comparing with the third quarter of 2010. The market turnover of the whole year 2013 has reached 553.75 trillion RMB. By the end of 2010, China's online banking marketing has over 300 million registered users. Therefore, there is no doubt that the trend of online banking

development cannot be halted and is becoming the new hot spot for banks' marketing strategy (Zhao, 2010), especially in China.

Online banking services are becoming mutually attractive for banks and users. From the banks' perspective, online banking helps them to establish and keep close contact with customers, thus cut the operating costs and achieve much better financial performance (Zaman, <http://www.arraydev.com/commerce/jibc/2011-08/KhalidZAMAN.pdf>, 27.04.2013). From the customers' perspective, online banking is becoming an attractive way to provide them transaction convenience, the round-the-clock availability and avoidance of long time waiting queues (Meuter et Al. 2000). Currently, different types of services function are available online that e-banking can offer, like balance inquiries, payment of utility bills and account transfers etc. when users send information request or conduct online banking transaction via internet instead of physical visiting to banking department, (Daniel, 1999; Mols, 1998; Sathye, 1999). What's more, it is vital to retain the customers in the internet banking space as the switching cost is significantly lower (Reichheld& Schefter, 2000). In other words, customer-orientated services play very important roles for competitive market. Good online banking services are becoming competitive advantage in retailing banking services, involving retaining e-customers.

In order to keep the original users, online banking providers should put themselves in their customers' shoes. Only customers' perception and assessment of online banking services quality they offered can be understood, then they probably could provide what users' really needs to meet customers' satisfaction. E-service quality is an important factor in determining failure and success of e-commerce business (Zavareh et al. 2012). Business that have already carried out online services and been succeed in offering e-services are beginning to realize the important role that e-services quality plays in addition to low price and web presence (Yang, 2001;Zeithaml, 2002), including online banking. According to Berry, Parasuraman and Zeithaml (1988), service quality plays an important role as competitive weapon and a significant differentiator for many service organizations. As a result, service provider including banking industry should recognize the importance to utilize good service quality in order to distinguish itself from others.

From the mentioned above, good e-service quality offering is the key issue for banking to survive in the intensively competitive banking market, especially maintain customer satisfaction (Wang et Al. 2003). As a result of this phenomenon, a good understanding of service attributes that customers use to evaluate online banking service quality is needed for banks so that the performance of e-service is able to be monitored and immediate adjustments and improve can be done as soon as possible.

Currently, there are a lot of studies that have been conducted about the measurement of service quality dimensions of brick and mortar banks, however, there are very few researches about service quality scale measures in online banking (Cai &Jun, 2001). Online banking, known as internet banking or e-banking, refers to “the use of technology which allows customers to perform banking transactions electronically without visiting brick and mortar institutions (Sethi & Bhatia, 2008) while traditional banking performs services by face-to-face interaction between cusomters and employees of banks. As can be seen that the most significant difference between traditional banking and online banking is the interaction between customers and employees of banks. In other words, the contact and interaction between users and providers is real-time face to face for traditional banking, while the other one is impersonal. Therefore, it is necessary and needed for e-banking industry to have a good knowledge of customers’ evaluation and perception of e-service quality and explore the suitable e-SQ scales, especially in China mainland. Therefore, it is my intent to show how E-S-QUAL/E-RecS-QUAL can be used to construct the suitable e-SQ measurement scale for online banking service in Bozhou City of China.

1.2. Research objectives and methodology

The objective of this thesis is to develop a multiple item scale for measuring service quality of online banking in Bozhou City of China. In other words, the research question could be defined as follows:

Which service quality dimensions should banks take in the consideration when assessing the quality of their online banking services in Bozhou City of China?

Briefly speaking, the main objectives of this thesis can be described separately as following.

Objectives of theoretical part are:

- To have a discussion of concept e-service quality and related e-service quality models, especially E-S-QUAL/E-RecS-QUAL proposed by Parasuraman et al.(2005)
- To define and establish the suitable multiple e-service item scale based on E-S-QUAL/E-RecS-QUAL model and other related models.

Objective of practical part is to get the refined measurement scale for online banking service through data collection and analysis.

The target group for this study is limited to the young and middle age group, e.g. university students or etc. Primary data collection is the data source for this thesis. Moreover, survey, which is the cost-efficient approach to collect the empirical data, has been chosen for this study.

Through the process of data collection and factor analysis in the empirical part, the refined scale for measuring online banking in China was identified, involving 3 dimensions and 14 items: customer service, privacy and preferential and reliable treatment. In addition, the finding indicated that the dimensions and items from E-S-QUAL/E-RecS-QUAL needed to be reorganized and reinterpreted for measuring online banking in Bozhou City of China.

1.3. Thesis structure

This thesis is divided into 6 Chapters. First chapter is the brief introduction, including background information that could be explained as my motivation for the thesis, objectives and methodology.

The second chapter shows the literature review for this study. One aspect is to provide the information of online banking development, online banking users' distribution etc. in China, as well as the definition of online banking, concept of service quality and the related models (including e-service quality). Then discussion of service quality in both contexts of online

banking and traditional banking continues with importance attached to the former one. The third chapter presents the preliminary theoretical model E-S-QUAL/E-RecS-QUAL proposed by Parasuraman et al. (2005) as well as our revised e-service quality scale for online banking in China. The fourth chapter sums up the main methods using in this thesis, including research approach, data collection and survey scales as well as the analysis methods of the survey.

The fifth chapter is the discussion of the research result based on the questionnaires returned. Finally, the sixth chapter is the conclusion and key points for the previous chapters of the thesis. This final chapter focuses on the main contributions of this study, summarizing the delivery of theoretical part and empirical part as well as the suggestions and recommendation for the future development and improvement of online banking services in China.

2. LITERATURE REVIEW

Firstly, the current status of online banking in China will be discussed in this chapter. Secondly, definition of online banking, concept of service quality and the related models (including e-service quality) continues. Thirdly, discussion of service quality in both contexts of online banking and traditional banking continues, especially focuses on the former one.

2.1. Explosive development of online banking in China

First aspect focuses on the explosive development of internet banking of China since this service began to carry out. Currently, banks are trying to improve and enhance their online services under the pressure of fierce competition in Chinese market. At the same time, more and more customers are taking full advantage of online services in order to save time to live in a much easier and flexible way, gain lower fee e.g. transaction fees. As can be seen, Information Economy era in China comes much later than some other developed countries in extending the internet to business. Fortunately, the domestic banks in China have been keenly aware of the importance of carrying out services of online banking and extending new services to get more customers, especially retain the old customers, and meanwhile increase the advantage of competition.

In 1996, Bank of China (BOC) started to make an investment into the development of online banking services that means that online banking in China was entering into the embryonic stage. With the rapid spread of online banking, China Merchants Bank (CMB) opened its website soon in 1997 and then offered the services of online banking in Shenzhen in 1998. Shortly thereafter, BOC launched the online banking services, providing online information service, account inquiry, bank transfer, online payment as well as fund collection etc. in 1999. After that, some of other major commercial banks opened their online services one after another, such as China Construction Bank, Industrial and Commercial Bank (ICBC), Agricultural Bank of China and so on. Until the end of 2002, all stated-owned banks and join-banks have established online banking

services that can show the popularity and the spread of this service. Moreover, 21 banks have offered the service of online transaction among all these banks. After initial stage of development between 1998 and 2002 mentioned above, the time for developing was coming in 2003. During the period from 2003 to 2010, banks have paid more attention toward brand image building, improvement and enhancement of products and services offering. In 2003, ICBC opened the personal online banking service named “financing @ me”. Then, “e-banking” is the own online banking services for Agricultural Bank of China to explore for image building. Different banks had their own focus on the development of online banking to gain competitive advantage. From 2010, the development of online banking stepped into a new stage: mature era. The development of some major commercial banks has been stable and began to concentrate on the tendency of internationalization. (iResearch, <http://wenku.baidu.com/view/b2b76b8a680203d8ce2f2451.html>, 02.05.2013) The more detailed development information about online banking services of major commercial banking in different stage will show as below in Appendix 1.

From the iResearch (2011), the total transaction amount of personal internet banking was 96.5 trillion yuan in 2010, with growth at 80.6% year-on-year. As can be seen from Figure 1 shown as below, the year-on-year growth rate remains stable from 2007 to 2014. This research was done in 2011. After 2010, it is expected that online banking will enter into the development of a mature stage that will keep stable of increasing year-on-year rate.

According to iResearch (2011), not only transaction scale of personal online banking but online banking user scale has been researched. As can be seen from the Figure 2, online banking users was 260 million in 2010, increasing by 34.7% year-on-year. The year-on-year increase rate was stable from 2008 to 2010. After 2010, it is expected that the year-on year rate will keep a steady growth since online banking development will enter into greater maturity.

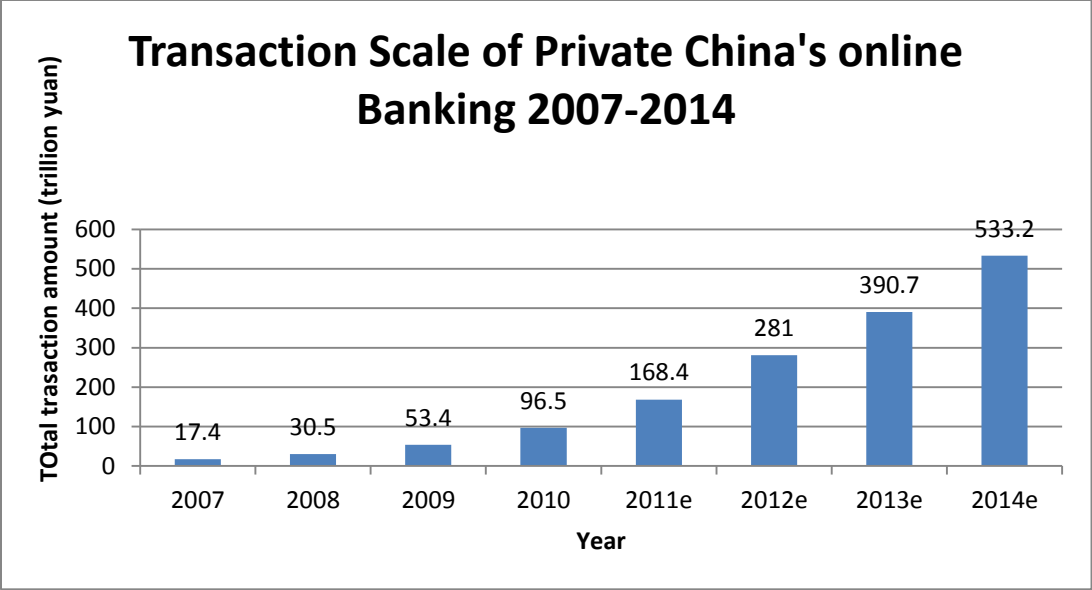


Figure 1 Transaction Scale of Private Internet Banking 2007-2014

(iResearch, <http://wenku.baidu.com/view/69e48544f7ec4afe04a1df2c.html>, 03.05.2013)

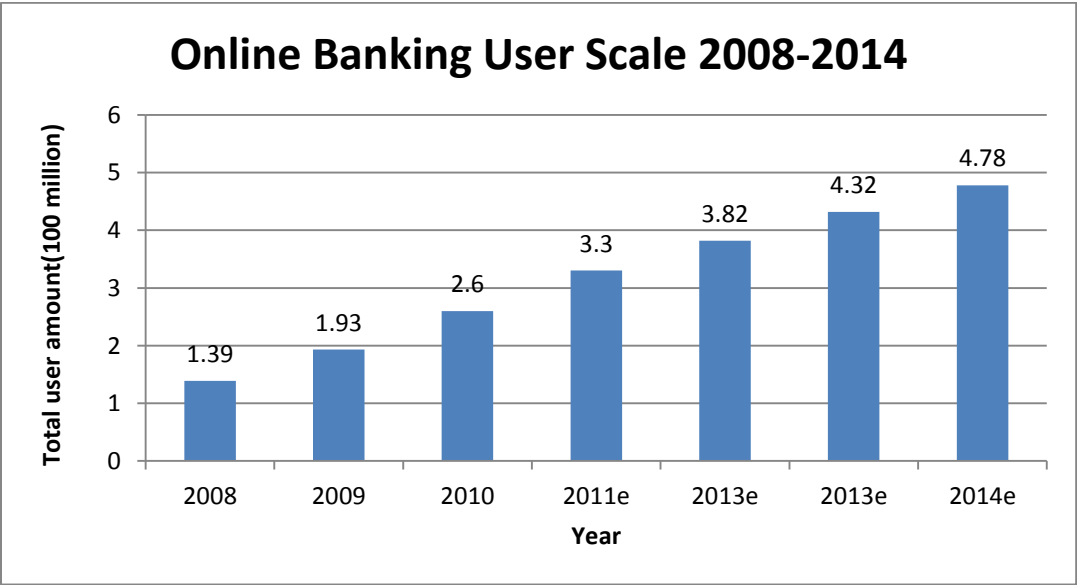


Figure 2 Online banking user scale

(iResearch, <http://wenku.baidu.com/view/69e48544f7ec4afe04a1df2c.html>, 03.05.2013).

As can be seen from the rapid development and popularity of online banking, it is easy to understand why urgent concentration on topic service quality of online banking in China. In order to have a better development for online banking in the future, service quality of online banking can bring competitive advantage for banks as well as more convenience for consumers.

2.2. Defining online banking

Online banking which is known as internet banking or e-banking, refers to “the use of technology which allows customers to perform banking transactions electronically without visiting brick and mortar institutions (Sethi & Bhatia, 2008).” In other words, online banking services are the services of banking offering delivered through internet instead of traditional face-to-face providing. Accordingly, the online banking services can be offered anywhere and anytime, hence bring a lot of convenience to users.

Moreover, not only can online banking provide the basic services, including accounts checking, accounts transfer etc., but it also develops into a variety of directional services to meet the diversified needs of users. It is very common phenomenon to see that almost all the services provided by branches or even by mobile phone can achieve internet access nowadays. As can be seen the Figure 3 shown as below, information technology helps banks to achieve the goal, which is not only offering branch-based services from internet, but also the only online value added services from internet. It means that online banking has its own unique services offering that can be differentiated it from traditional services offering from branch, including services of financial information menu, online load application, investment products (e.g. fund/bond purchasing), other financing products (e.g. life or traffic insurance purchasing) as well as the third party services (e.g. online tax payment, online bill payment) and other conveniences products. (Centeno, 2003)

In all, the attraction for consumers to use online banking can explained mainly in the following aspects: services offering anywhere and anytime, the round-the-clock availability and avoidance of long time waiting queues, speed, low price etc. (Mattila et. al, 2002). Bank providers still face

disadvantage and challenge in order to make profits despite benefits brought by online banking services. Users are able to choose the service providers freely if their requirements are not met, given that switching cost is becoming lower because of online banking service offering. As such, it is really challenge for bank providers to deal with immediately, otherwise the original customers would be lost. Accordingly, attraction for new coming customers is as important as retaining the old ones. At this moment, service quality plays a very important role to deal with the challenge. Good service deliveries are the assurance for meeting customer needs and retain the customers.

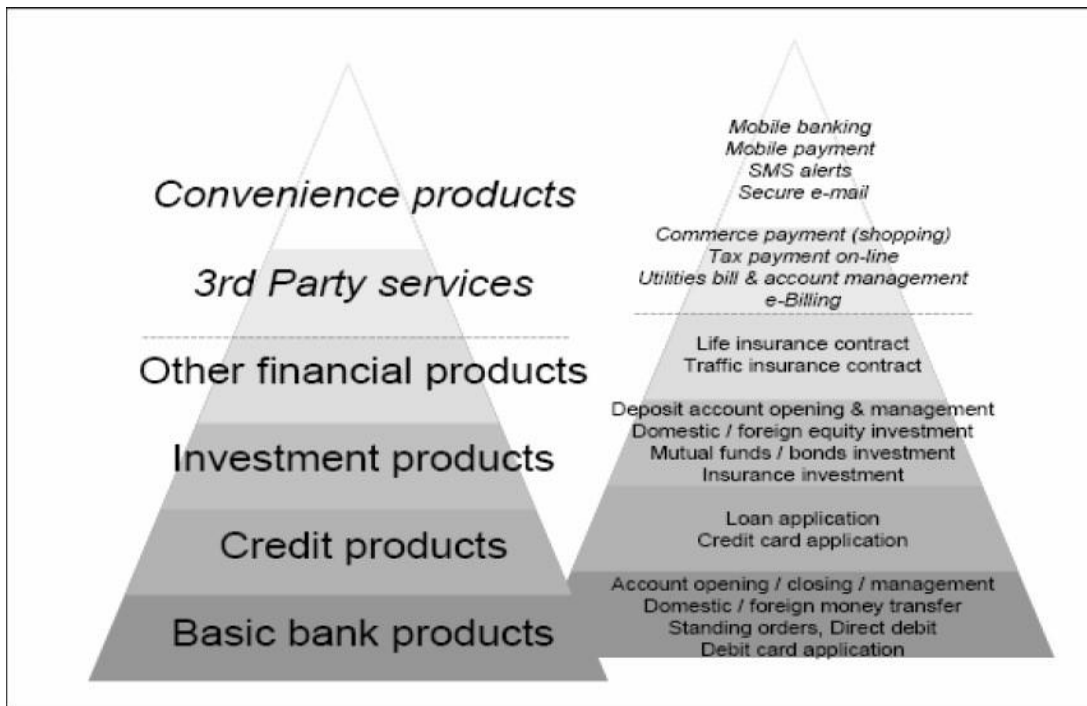


Figure 3 Classification of online banking services (Centeno, 2003)

2.3. Service quality

As mentioned above, service quality is the key element to determine the success or failure of business, including online banking. As a result, the concept of services, service quality, including

e-service quality will be introduced in detail. In addition, the related models for traditional service quality and e-service quality are also discussed in order to have a good understanding of this paper.

2.3.1. Traditional service quality

As shown in the previous studies of definition and measurement of quality, most of these researches have been conducted based on tangible products that are different from service (Crosby, 1979; Garvin, 1983). Because of the unique feature, defining and measuring the quality of service is in a different way. Fortunately, there has been a lot of research concentrating on traditional service quality during the past few decades (Ennew, et AL., 1993; Zeithaml et AL., 1996). Parasuraman et al. (1985) has summarized that service quality is not easy to define coming from three specific characteristics of services, namely: intangibility, heterogeneity and inseparability of production and consumption. Accordingly, service quality is described to be an abstract and elusive construct (Parasuraman et al., 1985). There is no doubt that service quality is even more difficult to define and evaluate comparing with goods quality.

Even though, service quality is defined and studied by many different researchers and organizations (Gronroos, 1982; Lewis & Booms, 1993; Parasuraman et.al, 1988). American Marketing Association defines service quality from two aspects: firstly, it refers to how the services are delivered by the firm that can lead to the satisfaction from the customers; secondly, it means excellent service quality delivered by firm resulting in meet or exceeds customers' expectation. Gronroos (1982) developed the model of "Total Perceived Service Quality" which he proposes that the comparison of what the customers' expectation of services offering and their experience of services delivered is the standard to evaluate service quality. Later, according to Lewis and Booms (1993), "service quality is a measure of how well the service level delivered matches customer expectations. Delivering quality service means conforming to customer expectations on a consistent basis". To sum up, service quality, perceived by consumers, comes from the comparison between the expectation (i.e. what they think firms should offer) and performance (e.g. what they experience and perceive the delivered services). In other words,

service quality can be defined as the gap or difference between the services they expect and perceive. Parasuraman et.al (1988, p. 15) have summarized based on previous research, service quality is “the overall evaluation of a service firm that results from comparing that firm’s performance with the customer’s general expectations of how firms in that industry should perform”.

Table 1 Review of traditional service quality models

Researchers	Dimension of service quality
Sasser, Olsen, and Wyckoff (1978)	materials, facilities and the quality of personnel
Gronroos (1982)	functional quality and technical quality
Lehtinen and Lehtinen (1982)	physical quality, corporate quality and interactive quality
Parasuraman et al. (1985): SERVQUAL Measuring difference of expectation and perception	tangibles, responsiveness, reliability, assurance, and empathy
Cronin & Taylor (1992): SERVPERF Measuring only customers’ perception	tangibles, responsiveness, reliability, assurance, and empathy

In addition to learning about the concept of service quality, the measurements for assessing service quality are taken into our consideration as well. In order to measure the expectation and perception from customers’ perspective, the dimensions of service quality should be paid more attention to. Many researches have been conducted to help define the measurement of service quality during past 20 years. Three researchers Sasser, Olsen, and Wyckoff (1978) first proposed three dimensions of service quality which are named: materials, facilities and the quality of personnel. Actually, dimensions contain not just the outcome of service quality. Later, Gronroos (1982) stated that there are two dimensions of service quality, namely: functional quality and technical quality. On one hand, functional quality refers to the manner in which the services are delivered (“how”) and on the other hand, the second one is defined as the outcome

of the delivered services (“what”). In other words, how the services are delivered can be defined as the process while what the services are delivered can be defined as outcome. According to the research from Lehtinen and Lehtinen (1982), there are three dimensions for assessing the service quality: physical quality, corporate quality and interactive quality. The first one, physical quality, refers to physical entities such as facilities or equipment. The second one, corporate quality can be understood easily and considered to be an important one as well which refers to corporate image and reputation. The last one, interactive quality, means the interaction between consumers and company as well as between some consumers with the other ones. To sum up, these studies mentioned above found that the evaluation of service quality includes not only process but also outcome. In other words, functional quality (process) and technical quality (outcome) are the two dimensions of service quality from previous studies: “the process that the customer went through to get to the outcome of the service” (Muyeed, 2012).

However, not only can this method mentioned above be used to evaluate the service quality, there is also the other method which can be used to define the dimensions of services quality. This method refers to a judgment of a given service by evaluating the specific features. (Kenova& Jonasson, 2006) According to Schneider & White (2004, p.51), service quality can be measured by “a judgment about a service’s overall excellence or superiority”. SERVQUAL model is one of the most representative examples developed by Parasuraman et al. (1985). Actually, this study from Parasuraman et al. has been considered to the most prominent in the field of service quality items scale. SERVQUAL model, which is an instrument for measuring the perceived service quality by comparing the services what consumers feel firms should offer and the delivered services what they experience, has developed and purified from 10 dimensions to five (tangibles, responsiveness, reliability, assurance, and empathy). In a more easily understandable way, this service quality measurement that can be called disconfirmation method has been developed according to the gap or difference between the expectation and perception from consumers’ perspective. The detailed information about SERVQUAL will show as below in Appendix 2.

SERVQUAL model is most widely used and popular for traditional service quality measurement, but there have been some different ideas of evaluating perceived service quality in recent years.

Instead of measuring the gap between customers' expectation and perception, the method of evaluating only the perception from consumers is considered to be reliable and more worthy convinced. At this moment, SERVPERF developed by Cronin & Taylor (1992) is a good example for supporting this idea. SERVPERF model that uses the same dimensions as SERVQUAL is an instrument for measuring the perceived service quality based on only the delivered services what consumers experience and perceive. Comparing with SERVQUAL instrument mentioned above, the only difference depends on whether the customers' expectation of a given service is measured or not. Besides, there have been some other studies done by other opponents. According to Dabhokar et.al (2000), the measurement only on the customers' perception from delivered services is more superior to the disconfirmation method. It means that measuring both customers' expectation and perception cannot have a better understanding and evaluation of their intension comparing with only measuring perception. In all, service quality can be measured by evaluating the service performance.

As can be seen from the text mentioned above, service quality can be defined and measured in different ways. Consequently, service quality is a multi-dimensional concept (Brady & Cronin, 2001).

Although a lot of researches have been done for service quality measurement, there is still a need for further study relating more to e-service quality because of its specific characteristics that traditional service models do not pay attention to. For example, five dimensions of SERVQUAL model mainly concentrate on consumer-to-employee interaction, but not interaction between consumer and website. There is no doubt that further study on online service quality measurement should be done.

2.3.2. Online service quality

It is apparent that online service (e-service) is the web-based service delivered over the internet which is different from traditional service delivering. In other words, the delivering of online service depends on the information which is first gathered from consumers and then analyzed by

providers (Rowley, 2006). As such, the needed and customized service can be offered. With the rapid development of information technology, online service offering has already changed the behavior and habit of people in their daily life, especially means of communication between firms and consumers. The main attraction of online service offering is not only because of its key roles played in determining the success or failure of e-commerce from providers' perspective, but also as a result of its provision of excellent experience for consumers in terms of information flow interaction (Yang et al., 2001; Santos, 2003).

There have been many several studies on online services. Different scholars defined e-service in different ways, but different views express the same meaning. Zeithamal et. al (2000) conceptualized e-service as web-based service delivered over the internet. According to Ghosh et al. (2004), online service is defined as an interactive information service. As known to us all, e-service delivery is not face-to face interaction between firms and consumers, but interactive information flow via technology which plays the role as a mediator, e.g. websites. As such, online service offering between service providers and consumers have to be fully dependent on the information technology. Accordingly, Rowley (2006) stated that e-service is described as the performance or effects whose delivery entirely relies on information technology. Overall, e-service quality refers to interactive, web-based customer service delivered via information technology which offered by provider according to customers' needs; moreover, the offering can maintain and consolidate the relationship between customers and firms (de Ruyter et al., 2001).

Learning about the concept of online service, it will help to have a better understanding of online service quality. According to Santos (2003), e-service quality is described as overall judgments and assessments concerning delivering of e-service from customers' perspective in the virtual marketplace. Zeithaml et al. (2000) study have defined e-service quality as the degree to which a website can promote the whole process of online shopping, including effective and efficient shopping, purchasing as well as services and products delivery. The competitive advantage is one of important benefit that good online service quality can offer for e-commerce. To sum up, e-service quality is considered to have the great potential to bring the benefits from the perspective of overall strategic as well as to improve running efficiency and profitability (Cronin, 2003).

Nowadays, online service quality plays a very important role in the era of information economy. With the popularity of online banking offering in e-commerce, the necessity to develop the scales for e-service evaluation has been coming to the virtual world. In fact, some of the researches have been done to define the measurement scales of e-service quality in order to better further development for e-commerce. In a more easily understandable way, those e-service quality measurement scales can be divided into two categories according to their research priorities and tendencies: website design quality and e-retailing service quality.

Table 2 Review of the main studies of online-perceived service quality

Researchers	Dimensions
Website design(interface) quality	
Loiacono et al. (2000)	WebQual: informational fit to task, interactivity, trust, response time, design appeal, intuitiveness, visual appeal, innovativeness, flow (emotional appeal), integrated communication, business process, substitutability
Barnes and Vidgen (2002)	WebQual 4.0: usability, design, information, trust, and empathy
Yoo & Donthu (2001)	ease of use, aesthetic design, processing speed and security
Liu & Arnett (2000)	quality of information, service, security, playfulness perceived by consumers and design of the website
Yang et al. (2004)	usability, usefulness, adequacy of information, accessibility and interaction
van Riel et al. (2001)	Core service, supporting services, user interface
Online retailing services	
Wolfenbarger & Gilly (2003)	eTailQ: website design, reliability/fulfillment, privacy/security and customer service
Madu and Madu(2002)	performance, features, structure, aesthetics, reliability, storage capacity, serviceability, security and system integrity, trust, responsiveness, product/service differentiation and customization, web store policies, reputation, assurance and empathy
Zeithaml, Parasuraman & Malhotra. (2000)	E-SQ: reliability, responsiveness, access, and flexibility, ease of navigation, efficiency, assurance/trust, security/privacy, price knowledge, site aesthetics and customization/personalization
Parasuraman, Zeithaml & Malhotra.(2005)	E-S-QUAL: efficiency, fulfillment, system availability, privacy E-RecS-QUAL :responsiveness, compensation and contact
Cox and Dale (2001)	Accessibility, communication, credibility, understanding ,appearance, availability

Initially, most firms concentrated on the establishment of attractive websites in order to have a good communication and make a good first impression on consumers. Those studies have focused on e-service quality regarding website design and web interactivity. Loiacono et al. (2000) proposed in their research the model WebQual, a measurement for evaluating websites on 12 dimensions and 36 items: informational fit to task; interactivity; trust; response time; design appeal; intuitiveness; visual appeal; innovativeness; flow(emotional appeal); integrated communication; business process; substitutability. This model WebQual is generated from only the students visiting to website rather than the actual buyer to assess the service experiences. As can be seen that the objective of this scale establishment is to gather the information for website designers rather than measuring the perceived service quality experience from consumers' perspective. Later, Barnes and Vidgen (2002) developed a very different model called WebQual 4.0 for measuring the e-service quality of internet bookstores in accordance with SERVQUAL. This scale is for rating a site's quality on five dimensions composed of 22 items: usability, design, information, trust, and empathy. Under the help of respondents, WebQual 4.0 is created without a need to finishing a purchasing process. According to Yoo and Donthu (2001), the e-service quality scale for online shopping website was developed, involving nine items divided into four dimensions: ease of use, aesthetic design, processing speed and security. Liu & Arnett (2000) did the research of webmasters for Fortune 1000 companies to explore the five dimensions that play important roles to determine the success of website: quality of information, service, security, playfulness perceived by consumers and design of the website. Yang et al. (2004) highlights five important dimensions critical to the success of web portal: usability, usefulness, adequacy of information, accessibility and interaction. To sum up, all of these studies mentioned above is to measure the e-service quality from the perspective of website design rather than to evaluate the service quality of online experience. As a result, these studies about website design quality cannot provide a comprehensive assessment of the e-service quality of a site, including not only evaluation of website design, but also the assessment of completely purchasing experience.

Some studies only concentrated on the web site design while others tried to measure online service quality of the whole transaction process. Online retailing services studies are the good examples for this focus. In other words, online retailing service researches have been done to

constitute a comprehensive evaluation of online service quality, including assessment of the actual online purchasing experience. In the context of online service experience, Zeithaml et al. (2000) study have defined e-service quality as the degree to which a website can facilitate the whole process of online shopping, including effective and efficient shopping, purchasing as well as services and products delivery. As a result, this type of measurement is used to evaluate the users' experiences before (which can be understood as evaluation of website quality), during and after the transaction process.

Wolfenbarger & Gilly (2003) developed eTailQ, a scale including 14 items which are divided into four factors: web site design (including items related to website design e.g. color, front, and attributes associate with product selection and customization as well), reliability/fulfillment (involving on-time delivery as well as accurate representation of the products and accurate orders), privacy/security(confidence in using this website), and customer service (interest and willingness for personnel to provide help and deal with problems as well as quick response to inquiries). As can be seen from this model, the whole transaction process is involved into the assessment of perceived e-service quality, especially including fulfillment and customer service. Then Madu and Madu (2002) presented a scale consisting of 15 dimensions based on SERVQUAL: performance, features, structure, aesthetics, reliability, storage capacity, serviceability, security and system integrity, trust, responsiveness, product/service differentiation and customization, web store policies, reputation, assurance and empathy. Besides, Zeithaml et al. (2000) made the research of e-service quality measurement, a scale for rating online shopping experience on 11 dimensions: reliability, responsiveness, access, and flexibility, ease of navigation, efficiency, assurance/trust, security/privacy, price knowledge, site aesthetics and customization/personalization. Later, Zeithaml et al. revised this scale based on combination of different kinds of concepts of online service quality (Loiacono, et al., 2000; Yoo and Donthu, 2001; Wolfenbarger and Gilly, 2002, 2003). The new revised scale E-S-QUAL/E-RecS-QUAL including E-S-QUAL and E-RecS-QUAL was lowered the dimension to seven: efficiency, fulfillment, system availability, privacy, responsiveness, compensation and contact (Parasuraman et al., 2005). In fact, there are still some other studies related the same focus of online service

quality measurement, such as four dimensions developed by Cox and Dale (2001). In order to have a more clear understanding of e-service measurement scale, Table 2 will list all of them.

2.4. Service quality in banking industry

2.4.1. Service quality in traditional banking

Many of the researches have been done for traditional banking service quality measurement based on the model SERVQUAL. The research done by Cowling & Newman(1995) using SERVQUAL scale in one bank found out that the highest difference between customers' expectation and perception was reliability, responsiveness, empathy, and the lowest for tangibles. According to the study carried out by Johnston (1995), there were 18 service quality dimensions found to evaluation the service quality by examining the customers' perception: access, aesthetics, attentiveness/helpfulness, availability, care, cleanliness, comfort, commitment, communication, competence, courtesy, flexibility, friendliness, functionality, integrity, reliability, responsiveness and security.

Moreover, Bahia and Nantel (2000) proposed another service quality measurement involving 31 attributes divided in six dimensions: effectiveness, assurance, access, price, tangibles, service portfolio and reliability. The research was done for retailing banks. Lastly, according to the research conducted by Oppewal and Vriens (2000), there were 28 items including four dimensions found to evaluate the service quality of retail banking: accessibility, competence, accuracy and friendliness as well as tangibles. As can be seen from this study, the most important element among the four dimensions from customers' perspective was proved to be accuracy and friendliness. Next in importance to determine customers' preference turned out to be competence, tangibles and accessibility.

2.4.2. Service quality in online banking

Nowadays, with the increasing importance of the information and communication technology, especially for financial services, researchers and managers have become interested in service quality measurement of online banking services (Jayawardhena, 2004). Different researches have

been done regarding different contexts. For example, according to the research carried out by Jun and Cai (2001), they developed the scale for online banking service quality measurement divided into three main categories using content analysis: customer service quality, online system quality as well as banking service product quality. However, in this research, those 17 items were not validated empirically by collecting data from users. Besides, according to tracking online banking consumers' usage patterns, the study done by Broderick and Vachropompuk (2002) found that the most important elements that could have an impact on service quality evaluation were cues in the service setting, key events in the service encounter and level and nature of customer participation. Unfortunately, this measurement mentioned above is still abstract rather than a precise and testable dimension of online service quality.

Fortunately, other researchers conducted more studies in different countries by applying the formal procedure mentioned detailed in Parasuraman et al., which was used for empirically online service quality scale validation of banking industry. As can be seen from a lot of examples mentioned as below. According to the study done by Jayawardhena (2004) in UK, a multiple-item scale for evaluating e-service quality of online banking was conducted based on revised SERVQUAL (Parasuraman et al., 1988) model for the internet context, including five dimensions composed of 21 items: access, website interface, trust, attention, credibility as well. In addition, Siu & Mou (2005) proposed a measurement scale based on E-SQ instrument (Zeithaml et al., 2000) by sampling 195 online bank users in Hong Kong, and finally identified four dimensions: credibility, efficiency, problem handling, and security. Moreover, Ho and Lin (2010) developed the online banking scale by sampling 500 e-bank users in Taiwan, and identified five dimensions in the end: efficiency, fulfillment, system availability, privacy, contact, compensation, site aesthetics, and customization. As can be seen from the reviews mentioned above, different researches have been done for online banking service quality measurement based on different scales of traditional service quality (SERVQUAL) and online service quality. In conclusion, there have already been some researches done for measuring online banking service quality, however there is still a lack of comprehensive scale in e-banking service measurement is still shorted. There is a need for further research done for this area, especially for cultural difference.

3. THEORETICAL MODEL

3.1. Preliminary theoretical model

In this thesis, the model E-S-QUAL/E-Rec S-QUAL developed by Parasuraman et al. (2005) was applied and modified for measurement establishment in online banking services of Chinese market. E-S-QUAL/E-Rec S-QUAL was established based on previous literature reviews of online service quality, involving not only interaction between consumers with website interface, but also the purchasing process and post interaction services as well. Accordingly, E-S-QUAL/E-Rec S-QUAL is considered to be one of the most comprehensive measurement to evaluate online services, involving the users' experiences before (which can be understood as evaluation of website quality), during (purchasing process) and after the transaction process (after-sales service). E-S-QUAL/E-Rec S-QUAL was chosen as the theoretical model of this thesis.

At the first stage, the initial e-SQ scale was formed from 11 dimensions developed by Zeithaml et al. (2000) which are: reliability, responsiveness, access, flexibility, ease of navigation, efficiency, assurance/trust, security/privacy, price knowledge, site aesthetics and customization/personalization. The detailed information and description of perceived e-SQ is shown below Table 3.

Table 3 Dimensions of perceived e-SQ

E-Service Quality Dimension	Description
Reliability	Correct technical functioning of the site and the accuracy of service promises (having items in stock, delivering what is ordered, delivering when promised), billing, and product information.
Responsiveness	Quick response and the ability to get help if there is a problem or question
Access	The ability to get on the site quickly and to reach the company when needed
Flexibility	Choice of ways to pay, ship, buy, search for and return items
Ease of navigation	The site contains functions that help customers find what they need without difficulty, possesses a good search engine, and allows the customer to maneuver easily and quickly back and forth through the pages
Efficiency	The site is simple to use, structured properly, requires minimum of information to be input by the customer
Assurance/trust	The confidence the customer feels in dealing with the site and is due to the reputation of the site and the products or services it sells as well as clear and truthful information presented
Security/privacy	The degree to which the customer believes the site is safe from intrusion and personal information is protected
Price knowledge	The extent to which the customer can determine shipping price, total price and comparative prices during the shopping process
Site aesthetics	The appearance of the site
Customization/personalization	How much and how easily the site can be tailored to individual customers' preferences, histories and ways of shopping

Source: Parasuraman, A., Zeithaml, V. and Malhotra A. (2005), "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality"

As can be seen from Table mentioned above, E-SERVQUAL (2000) model is very similar to that of model SERVQUAL although it has new added dimensions that make differences. The service quality dimensions of reliability, responsiveness, access, assurance/trust (credibility), Customization/personalization plays important roles in both internet and traditional service contexts. Quality dimensions of assurance, responsiveness and security express the same meaning in both contexts while reliability and access are different. In other words, those two

dimensions of reliability and access for online services have different attributes underlying which concentrate on specific online issues (Zeithaml et al., 2000). It is clear to see the difference between different contexts in order to have a better understanding of e-service quality model. As can be seen, other perceptual attributes that differs from traditional services, like flexibility, ease of navigation as well as site aesthetics are related to technology, involving the aspects of website design and user experience etc. The most important attribute that involved is price knowledge, which is unique for online shopping studied by Zeithaml et al. 2000. This new feature will be helpful for establishing our own service quality model.

Then scale reduction and data analysis were done later. Accordingly, the previous 11 dimension was reduced and refined to 7 dimensions, involving E-S-QUAL scale and E-RecS-QUAL scale (Parasuraman et al, 2005). E-S-QUAL is considered to be the core service quality measurement scale while E-RecS-QUAL is for recovery scale. The detailed information and description about the revised E-S-QUAL/E-Rec S-QUAL is shown as below Table 4 and Table 5.

After the stage of scale development, the newly revised instrument E-S-QUAL/E-Rec S-QUAL was empirical tested by additional research for reassessment of scale reliability and validity. This research was done by distributing questionnaires to users randomly who had visited the two websites: amazon.com and walmart.com most often at that time.

Table 4 E-S-QUAL scale

E-S-QUAL scale	
Dimension	Description
Efficiency	The ease and speed of accessing and using the website
Fulfillment	The extent to which the site's promises about order delivery and item availability are fulfilled
System Availability	The correct technical functioning of the site
Privacy	The degree to which the site is safe and protects customer information

Source: Parasuraman, A., Zeithaml, V. and Malhotra A. (2005), "E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality", p. 220

Table 5 E-RecS-QUAL scale

E-RecS-QUAL	
Dimension	Description
Responsiveness	Effective handling of problems and returns through the site
Compensation	The degree to which the site compensates the customers for problems
Contact	The availability of assistance through telephone or online representatives

To sum up, the first stage is the exploration study for dimension development, and another two phases are the part for empirical data collection and analysis. After the empirical study, the refined dimension scale is got. In order to capture a better picture of development of E-SERVQUAL instrument, the comparison between dimensions of online service quality in 2000 and those in 2005 are presented in Table 6 as below clearly.

Table 6 Comparison between E-SERVQUAL instrument in 2000 and E-SQ (including E-S-QUAL and E-RecS-QUAL scales in 2005

E-SERVQUAL Instrument dimension studied by Zeithaml, Parasuraman and Malhotra (2000)	E-S-QUAL/E-Rec S-QUAL further studied by Parasuraman, Zeithaml and Malhotra (2002, 2005)
Reliability	Fulfillment, System Availability
Responsiveness	Responsiveness
Access	Efficiency, contact
Flexibility	
Ease of navigation	Efficiency
Efficiency	Efficiency
Assurance/Trust	
Security/Privacy	Privacy
Price Knowledge	
Site aesthetics	
Customization/personalization	
	Compensation

Source: Kenova V. and Jonasson P. (2006). Quality Online Banking Services, Technical Report, Jonkoping International Business School.

As can be seen from Table 6, Reliability means “correct technical functioning of the site and the accuracy of service promises (having items in stock, delivering what is ordered, delivering when promised), billing, and product information” (Parasuraman, 2000), involving dimensions of fulfillment and system availability defined in 2002. Access refers to “the ability to get on the site quickly and to reach the company when needed” (Parasuraman, 2000), involving dimension of efficiency and contact defined separately in 2002. Besides, dimensions of flexibility, assurance, price knowledge, site aesthetics as well as customization are pruned and reduced after the empirical phases have been done. At the same times, dimension of compensation is added for better customer service if the problems were happened to customers after transaction.

3.2. Summary of the theoretical framework

This paper have already discussed the concept of service, service quality (including traditional service quality and e-service quality) as well as the related model of measuring service quality, especially the related model that have been used in online banking services. The most popular model SERVQUAL for measuring traditional service quality and E-S-QUAL/E-Rec S-QUAL for e-service quality have been paid more attention to in this thesis mentioned above in order to help to have a good understanding of the development of service quality from traditional service to online service. After the comparison of these two models, the difference between traditional service and online service can be understood in a better way, especially the importance of service quality measurement. Besides, the development of service quality and the changing situation with the increased popularity of online services could be explained and understood by showing both traditional service quality and online service quality.

In this thesis, the author would like to use E-S-QUAL/E-Rec S-QUAL as a basis to help establish and develop the suitable model for online banking service quality measurement in China. Choosing this instrument is not only because of the popularity of its application but also as a result of involvement of the whole process, such as before, during and after transaction process. In other words, the post transaction service was paid more attention to. As mentioned

before, E-S-QUAL/E-Rec S-QUAL model was developed by Zeithaml, Parasuraman and Malhotra for online service quality scale measurement in 2005.

We all know that E-S-QUAL/E-Rec S-QUAL instrument is initially used for measuring online service quality rather than concentrating on the special industry area: online banking service. It means E-S-QUAL/E-Rec S-QUAL could not cover all the aspects of our research. As such, our established model is not the same as E-S-QUAL/E-Rec S-QUAL instrument. Instead, the model established in this study is revised based on E-S-QUAL/E-Rec S-QUAL instrument. In addition, as is presented in Table 6, almost half of dimensions of online service quality from 2000 are not covered in those from 2005. However, some of those discarded dimensions done in 2005 will be taken into consideration for online banking industry in China. This is also the purpose for learning the whole development process of E-S-QUAL/E-Rec S-QUAL instrument and doing comparison between dimensions of 2000 and those of 2005. As a result, E-S-QUAL/E-Rec S-QUAL is the basis for model establishment in this study. Besides, the other new dimensions will be added into the model from other related literature review according to the needs of online banking in China.

In this thesis, the dimensions of online banking service are composed of Efficiency, privacy, responsiveness/contact, as well as assurance, empathy and website design. Some of the dimensions: efficiency, privacy, responsiveness/contact are from the theoretical model E-S-QUAL/E-Rec S-QUAL L used as a basis while others are from some other related models in accordance with the needs of online banking services in China. The dimension: assurance is from the first step development of E-SERVQUAL instrument developed in 2000. Empathy and website design are the new dimensions added to the model in this study. As can be seen from Table 7, the difference between E-S-QUAL/E-Rec S-QUAL and revised e-SQ is shown in details. Besides, all the dimensions will be explained and shown in details in Table 8 that plays very important roles for our questionnaires.

Table 7 Differences between E-SERVQUAL (2000), E-S-QUAL/E-Rec S-QUAL (2005) and the revised e-SQ scale for this study

E-SERVQUAL (2000)	E-S-QUAL/E-Rec S-QUAL scale (, 2005)	The revised e-SQ scale
Reliability	Fulfillment, System Availability	–
Responsiveness	Responsiveness	Responsiveness/contact
Access	Efficiency, contact	Efficiency(EF3)
Flexibility		Website Design (W1)
Ease of navigation	Efficiency	Efficiency (EF1, EF2,EF4,EF5,EF6)
Efficiency	Efficiency	
Assurance/Trust		Assurance Privacy/Trust(P4)
Security/Privacy	Privacy	Privacy/Trust (P1,P2,P3,P5)
Price Knowledge		–
Site aesthetics		Website design(W2)
Customization/personalization		Empathy(E1)
	Compensation	Compensation/ preferential treatment(C1,C2)

Table 8 Internet bank service quality

Service quality dimensions	Researchers	Service quality attributes
Efficiency(6)	Parasuraman et.al (2005); Ho&Lin (2010)	EF1.This site can process information and transaction quickly;
	Parasuraman et.al(2005)	EF2.A user can get the information from the website that is needed easily and quickly;
	Parasuraman et.al(2005); Ho&Lin(2010)	EF3.It loads page quickly;
	Parasuraman et.al(2005)	EF4.It makes it easy to get anywhere on the site;
	Kenova & Jonasson(2006)	EF5. The information provided by the website is easily understandable and ease of handling.
	Kenova &Jonasson(2006)	EF6. It is possible to use online banking utilities without a lot of effect.
Security/trust(5)	Parasuraman et.al(2005); Zeithaml et al.(2000)	P1.This site can protect personal information of users and no misuse;
	Parasuraman et.al(2005); Zeithaml et al.(2000)	P2.This site protects information about my bank cards.
	Wolfinbarger et al.(2003); Kenova &Jonasson(2006)	P3.Transaction can be completed in a safe mode;
	Zavareh ^a (2012); Kenova &Jonasson(2006)	P4.A user is confidence in the online banking services;
	–	P5.It offers several of security tools (U dun, dynamic password). (learnt from internship and users' experience in China)
Responsiveness(2)	Parasuraman et.al(2005)	R1.It can deal with and solve the problems promptly;
	–	R2.This site can provide adequate remedy to deal with the problems (e.g. different kinds of solutions).
Assurance (5)	Zeithaml et al.(2000); Ho & Lin (2010); Kenova &Jonasson(2006)	A1. “The reputation and image of this online banking is good”;
	Parasuraman et.al(2005)	A2.The system is stable and reliable which would not have the situation of transaction termination.
	Parasuraman et.al(1988)	A3.Customer service personnel have good professional knowledge and ability;
	Parasuraman et.al(1988)	A4.Customer service personnel have good service attitude;
	Ho & Lin(2010)	A5.The information provided by website is accurate and reliable;

Website design(4)	Zeithaml et al.(2000); Kenova &Jonasson(2006)	W1.This website can provide different ways of logging into online banking which is very flexible (e.g. user name, account number);
	Zeithaml et al.(2000); Ho & Lin(2010)	W2. “The site map of internet banking portal is clear, the content and picture of the portal site are user-friendly”;
	Ho & Lin(2010)	W3.Matters relating to customer interests and rights are prominently presented on the website;
	Ho & Lin(2010)	W4. The information provided by website is always updated in time.
Empathy(5)	Zeithaml et al.(2000); Ho&Lin(2010); Wolfenbarger et al.(2003)	E1.This website can provide customized services;
	Ho&Lin(2010);	E2.Online banking offers full information about features of various products or services (e.g. fund, stock);
	Aladwani et al.(2002)	E3. This site provides the video demo showing how to use online banking utilities it offers.
	–	E4.It offers a variety of electronic statements query
	–	E5.Online banking is authorized to support and deal with a lot of business for consumers online: buying financial products online;
Compensation/ preferential treatment(2)	Ho & Lin (2010)	C1.The online banking can provide preferential rates and charging fees.
	–	C2.The online banking can charge reasonable fees (transaction fees);

Efficiency: Parasuraman et.al (2005) defined it as “the ease and speed of accessing and using the website”, including loading pages fast, finding what the users’ need easily and so on. As a result, there are six items for this dimension that can be seen in the Table 7. In fact, this definition of efficiency includes “the ease of navigation” and “access” which have mentioned in the first phase of E-SERVQUAL instrument development.

Privacy/Trust: it was defined as “the degree to which the site is safe and protects customer information”, such as personal information protection. Finally, there are three items for this dimension.

Responsiveness/contact: this dimension combines responsiveness and contact together. It means “effective handling of problems and returns through the site” as well as “the availability of assistance through telephone or online representatives”. According to the definition, there are three items for this dimension.

Assurance: according to Parasuraman et.al (2000), it was defined as “the confidence the customer feels in dealing with the site and is due to the reputation of the site and the products or services it sells as well as clear and truthful information presented”, involving reputation of the site, a guarantee offering as well as rating provided by other customers. From the perspective of traditional service quality (SERVQUAL instrument), it was defined as “the knowledge and courtesy of employees and their ability to convey trust and confidence (Parasuraman et al., 1985).” As can be seen from both definitions, the meaning of assurance in both traditional service and online service are the same that have mentioned before. Finally, there are six items for this dimension.

Website design: this concept is very similar to dimension of site aesthetics mentioned in the first phase development for E-SERVQUAL instrument in 2000. Site aesthetics was defined as “the appearance of the site” by Parasuraman et.al (2000). According to the research done by Ho & Lin(2010), website design referred to the design of website, such as content updating coinciding with dimensions of a lot of previous studies (Aladwania and Palvia, 2002; Yang and Fang, 2004; Yang et al., 2004), but not limited to technical development, visual design etc. In addition, availability and accessibility of information is important for website design as well. On one hand, Wolfinbarger and Gilly (2001) have mentioned that availability of information plays a very important role of online purchasing. As known to us all, the significant difference between online shopping and traditional shopping is whether consumers have face-to-face contact with a salesperson. In other words, customers can get information they want to know from internet for online shopping instead of direct contact with a salesperson. (Zeithaml et al., 2002) On the other hand, it helps customer to save more searching-time if all the information is available and accessible. In general, website design could facilitate information technology application and access to online banking services for users. There are four items under this dimension.

Empathy: it was defined as “The providing of caring, individualized attention to customers.” (Parasuraman et al., 1985). In an easily understanding way, it means that providers standing in the position of consumers offer the services to consumers. According to the real needs of consumers, the services and products are produced and offered. At the same times, based on Parasuraman et.al (2000), customization was defined as “how much and how easily the site can be tailored to individual customers’ preferences, histories and ways of shopping.” As such, there is no doubt that customization is the typical characteristics of empathy. In the end, there are four items for this dimension.

Compensation/preferential treatment: According to Parasuraman et.al (2005), compensation was defined as “the degree to which the site compensates the customers for problems”. This dimension is related to dimension of “price knowledge” investigated in the first phase of development of E-SERVQUAL by Zeithaml et al. (2000). Originally, compensation was used for measuring online shopping service quality when problem was happening. Instead, compensation referred to favorable treatment/ preferential treatment for online banking service quality in Taiwan according to Wu et.al (2008), involving more favorable price offering (such as the service charge for fund) as well as more preferential/ favorable treatment offering based on more transaction number of times or amount of money. As a result, compensation can be explained as preferential treatment as well. Ho & Lin (2010) defined preferential treatment as the value- added services for online banking such as lower rate or fees comparing with traditional banking service provided. As such, preferential treatment offering could be the competitive advantage for using online banking services. Not only more convenience could online banking provide, but also lower rate or charges is offered that make it different from traditional banking services. According to the cultural difference and needs of Chinese users, there are two items for this dimension.

4. RESEARCH METHOD

As mentioned previously, the objective of this study is to develop a multiple item scale for measuring service quality of online banking in Bozhou. The objective of the theoretical part is to define and establish the suitable multiple e-service item scale based on E-S-QUAL/E-Rec S-QUAL model and other related models which have already done in the previous part. Then the empirical part is to test the model through data collection and statistical analysis, mainly concentrating on factor analysis, and finally get the refined item scale for online banking measurement in Bozhou City of China.

4.1. Research approach

Qualitative research is concerned with exploring a deeper understanding of social phenomenon, which is usually to help understand the roots of an event or why things are the way they are in our society (Hancock, 1998). Qualitative research is defined to be “a form of systematic empirical inquiry into meaning” by Shank (p.5) (as cited by Ospina from Shank, 2004). “Systematic” means “planned, ordered and public” according to the rules which is recognized by the members of qualitative research group. “Empirical inquiry” means the inquiry is closely related to real life experience. As such, qualitative research is aimed at getting an in-depth understanding meaning of the social phenomenon, e.g. the potential motives. This method tries to find the answers by asking: why? How? in what way(Hancock,1998)? Normally, qualitative data collection is based on direct communication with people, e.g. face-to-face interview, or observation (Hancock, 1998).

Quantitative research is defined as “a systematic investigation of social phenomenon via statistical, mathematical or computational techniques” (Given, 2008). Or put it in another way, quantitative research is grounded in the development of mathematic models, theory or testable hypotheses that is more suitable for phenomenon analysis (Kenova & Jonasson, 2006). This method tries to find the answers by asking: to what extent? how much? how many? how often?

and etc. (Hancock, 1998). This approach pays more attention towards data mining which allows flexibility of treating data so as to insure reliability and validity (Amaratunga et Al, 2002).

Both research methods were taken into consideration to help the data analysis here. In addition, survey was one of the most important. Qualitative method was helpful for survey design via one to one interview when I did my internship in ICBC in Bozhou City of China. After collecting all the surveys back, quantitative method had an important role to play which was used to measure “what extent” the customer perceive and experience the service quality of online banking nowadays in China. In addition, the statistical analysis based on the collected data was necessary, e.g. factor analysis. Furthermore, because of the statistical analysis of the data, the dimensions of measuring service quality of online banking would be tested and finally developed. As a result, the mixture of using both qualitative and quantitative methods were found to be appropriate for the thesis.

4.2. Data collection

Statistical data can be categorized as two parts: primary data and secondary data. The source of primary data is directly from the investigation or questionnaire, which is gathered by the person for his/her own purpose. Instead, the data collected by some other people or some agencies calls secondary data. It means that “data collected by one is used by another”. The most significant difference is that primary data is original while secondary data is not. (Giri, 2008, 83) Obviously, primary data collection was suitable for this study.

A pre-test survey was carried out before sending out the questionnaires. Test targets were ten people who are online banking users, among whom five people are employees of ICBC, while the rest are customers. The purpose of this pre-test was to check the reliability of the survey questionnaire as well as exam whether there were some unclear questions that cause misunderstanding. Fortunately, the survey questions was found to easily understand.

The paper questionnaire was the data collection method for this study. The survey consisted of four parts. Part 1 was concerned with the demographic information of respondents including gender, age, education background, occupation, income per month. Part 2 created the profile about the information of using online banking as a user: which online banks were used more often, how often a user used online banking per month, the main reasons a respondent used online banking, the services a user would like to use most often, the service quality attributes a user paid most attention to, where a user got the information of online banking and how many years a user had used online banking services. In addition, the user should prioritize the maximum 3 important service quality attributes he/she paid most attention to. Part 3 was the most important containing 29 service quality attributes. According to the users' real life experience of different online banks in China, they had to help evaluate those attributes based on Likert scale (5-step scale). Part 4 consisted of two open questions about which online banking a user consider to be superior in terms of service quality and the advices for improvement in the future development of online banking in China. There are several articles shown as follows that are very helpful and useful for the survey design: Wang (2009), Ho & Lin (2010), Wu et.al (2008), Zavareh^a et.al (2012).

Data collection lasted for around 3 weeks in the late January of 2013. 200 questionnaires were sent out for individual online banking users in Bozhou city. Valid questionnaires was 173, and accounted for 86.5% of the total number.

4.3. Target group

The target group focused on the young and middle age group, especially young age e.g. university students etc. As could be seen from the following Figure 4, the majority of online banking users were between 18 and 39 which account for 76, 4% in 2011. Age group below 18 year old was 4,1% while 40 or above was higher at 19,2%. According to this research in 2011 from iResearch Consulting Group, this thesis decided to focus on the age group between 19 and 39.

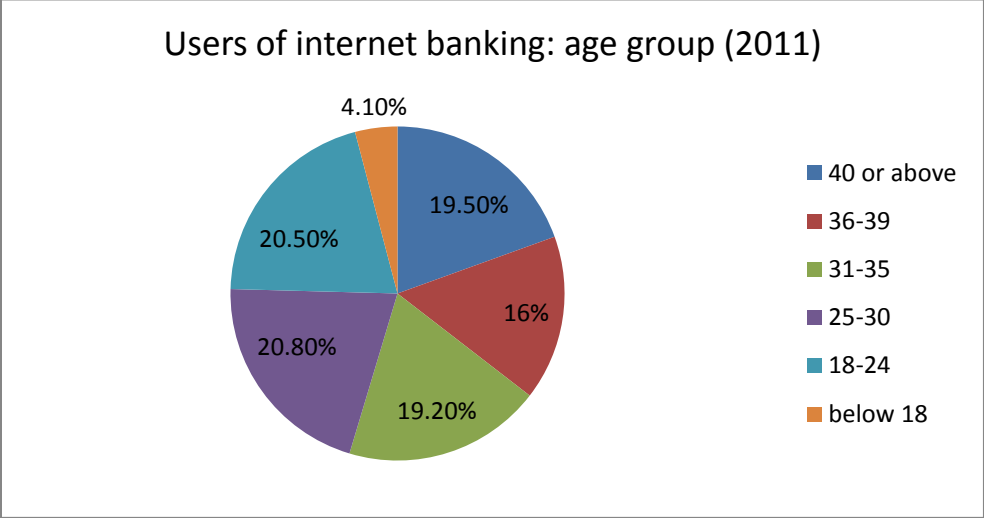


Figure 4 Users of internet banking

(iResearch Consulting Group, <http://wenku.baidu.com/view/ccc254200722192e4536f6d9.html>)

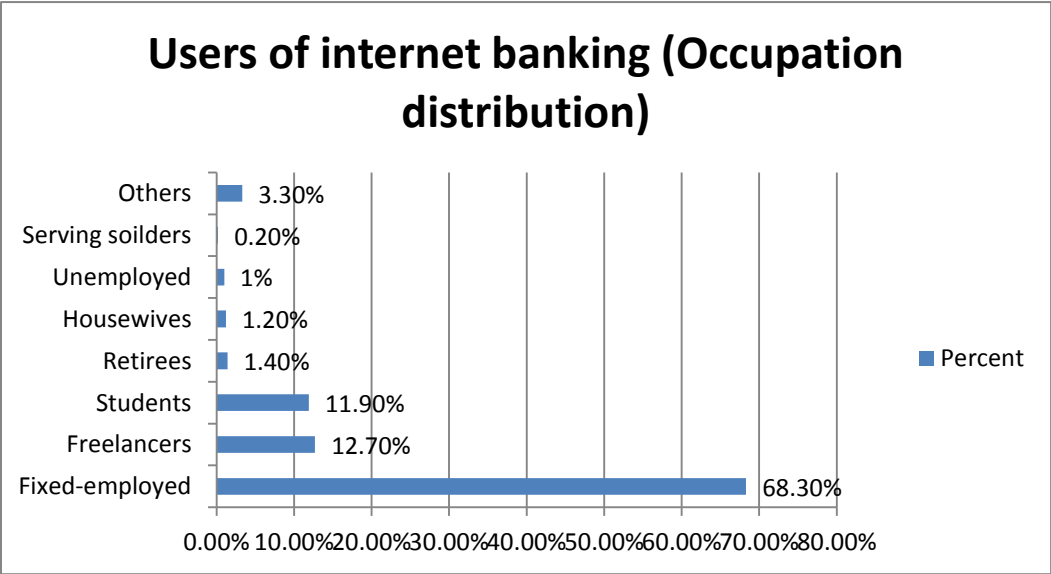


Figure 5 Users of internet banking (occupation distribution)

(iResearch Consulting Group, (<http://wenku.baidu.com/view/ccc254200722192e4536f6d9.html>, 28.03.2013)

Once the target group was determined, the next stage was sample selection considering the representativeness of study sample. According to the research done by iResearch Consulting Group in 2011, the occupation distribution of online banking users studied. As could be seen from the Figure 5 shown as below, the biggest online banking users group is fixed-employed at 68.3%, headed freelancers at 12.7% and students at 11.9%.

In this thesis, Convenience or opportunity sampling was chosen for this thesis belonging to non-probabilistic sampling which is “characterized by a nonsystematic approach to recruiting respondents that often allows a potential respondent to self-select into the sample” (http://www.rand.org/content/dam/rand/pubs/monograph_reports/MR1480/MR1480.ch4.pdf). In addition, sample selection was based on the occupation distribution. Accordingly, the questionnaires were sent and gathered from respondents who were interested in joining the research actively in different areas: Bozhou Teachers College or around, different areas for fixed-employed (e.g. hospital, police office) as well as ICBC (Industrial and Commercial Bank of China).

4.4. Survey scales

Five-step Likert scale was used to help measure and evaluate service quality attributes in the questionnaire for this study. Five-point scale is the most common scale and be considered to be the simplest. Five step Likert scale represent 5 different level of attitudes. The normal format of five-point scale could be: “1.strongly disagree”, “2.disagree”, “3.neural”, “4.agree”, and “5.strongly agree” (Wang, 2009). Accordingly, each number can represent different level of attitudes. It was more convenience for data analysis of questions by using Likert scale.

4.5. Analysis methods of the survey

The collected data in this thesis was performed in both Excel and SPSS software. According to the purpose from the empirical part, descriptive statistics, the item-total correlation, Cronbach's Alpha Test of Reliability, exploratory factor analysis by using principal component analysis as the extraction method and was used for the data management in the survey. Descriptive statistics was to help understand the basic information of users' profile, e.g. age distribution. After that, the model that established in the theoretical part needed to be tested. According to the methods that was used in the article: "SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality" written by Parasuramna et.al (1988), the item-to-total correlation was calculated for pruning the prior list of items and improving the levels of Cronbach's Alpha. At the same time, Cronbach's Alpha Test of Reliability played an important role as well. The purpose of this test was to evaluate the internal consistency of each of the service quality attributes. After deleting items for improving the internal reliability, exploratory factor analysis was used to help explore service quality dimensions of online banking service. Finally, the refined service quality scale was established through several rounds of repeat of factor analysis. Even though the finally model was conducted, the most important was to do the test of reliability and validity for the refined scale. As such, the final scale could be proved to be a good standard.

Here was the brief description of analysis methods of the survey, the more detailed techniques would be introduced very well.

4.5.1. Item-to- total correlation and cronbach's alpha test of reliability

The most common and popular method for measuring internal reliability is to use Cronbach's Alpha Test of Reliability. Cronbach's Alpha is the coefficient of internal consistency (reliability). The most important role played in this test is α -score, a value between 0 and 1. The criteria of Cronbach α -score is defined to be greater than 0.7, implying the higher internal reliability of given items in a scale (Nunnally and Bernstein, 1994). At the same times, Garson (2002) states

that α -score with the value like 0,8 or even 0,6 is adequate for indicating the internal consistency. In all, the higher the value of α -score, the more reliable it can indicate.

What's more, item-to-total correlation can help to improve the level of α -score by deleting the prior items list. The acceptable minimum value of 0,4 for item-total correlation is considered to be reliable (Nunnally, 1978). Otherwise, the item with value lower than 0,4 should be eliminated for insuring the whole quality of data.

4.5.2. Factor analysis

The most important stage for this thesis was to test the model established in theoretical part and explore the scales of service quality of China in online banking. At this time, factor analysis played important roles for scale refinement.

Factor analysis is defined as a statistical method “used to identify factors that statistically explain the variation and co-variation among measures” (Green, Salking & Akey, 2000, p.292). Principal Component Analysis is performed to take choices of initial number of factors in the first stage. In fact, PCA is used to explain as much as possible of variance. The most popular standard for extraction of the number of factors depends on the eigen value which should be above 1.0. After decision making for extraction of factors, Varimax with Kaiser Normalization rotation is used for the second step. At this stage, the attributes are reorganized into new constructs through rotation. Although the number of factors is got from process of PCA, it is still difficult to make those constructs easier to be understood. As such, Varimax Rotation Method provides one way to explain and give the suitable definition for the factors and make the decision of the number of new constructs as well (Green, Salkind & Akey, 2000) At this point, the factor loading of retained variables is preferably higher than 0.5 for further analysis according to the proposal of some authors (Jayawardhena, 2004). Otherwise, these items with factor loading below 0.5 should be deleted. At the same time, there is one important criterion for the variables among different factors. In order to significantly distinguish one factor from another, items with factor loading above 0.3 on three or more factors should be deleted for better analysis (Doll and Torkzadeh,

1988). Several iterations of exploratory factor analysis procedure should be done after pruning those items to get the refined measurement scale.

Before conducting EFA, KMO and Bartlett's Test should be done to insure whether factor analysis was considered appropriately for this measurement. As known to us all, the higher the correlation among all the items is, the better the effect of dimensionality reduction would be. Accordingly, KMO index above 0.5 is the standard for conducting factor analysis. In addition, it is better to get the p-value from Bartlett's Test less than 0.05. Based on these two tests, EFA can be considered suitable for further measurement.

4.5.3. Reliability and validity

Reliability and validity play important roles in developing measurement and validating procedure for general research.

Internal reliability measuring was needed and used in this study. Internal reliability refers to internal consistency that concerns about the extent to which all the items pertaining to one dimension can measure the same thing and express the same idea. (Michael, http://michaeljmillerphd.com/res500_lecturenotes/reliability_and_validity.pdf, 19.04.2013) Furthermore, Cronbach's Alpha Test of Reliability is the most popular method for measuring internal reliability that was used in this study.

Validity is defined as "the ability of a scale or measuring instrument to measure what is intended to be measured" (Eriksson & Wiedersheim-Paul, 1997, p.38). Although there are many types of validity which play important roles involving: face validity, construct validity, criterion-related validity and etc, construct validity was the easiest to test statistically in this thesis. Construct validity is defined as "the degree to which an instrument measures the trait or theoretical construct that it is intended to measure" (Miller, http://michaeljmillerphd.com/res500_lecturenotes/reliability_and_validity.pdf, 19.04). In this study, convergent and discriminatory validity were used for assessing construct validity. Convergent validity refers to measures of items on the same constructs that are in reality related

to each other should be highly correlated, while discriminatory validity is to measure items from different constructs that are not related in reality should have lower correlation with each other. In addition, the discriminatory validity are tested by using the multitrait-multimethod approach, which was developed by Campbell and Fiske (1959). On one hand, the criterion for Convergent validity is to test whether the factor loading of the confirmatory model is higher than 0.5(Sanzo et al., 2003). On the other hand, discriminatory validity is examined by counting the number of violations that an item has much higher correlation with another constructs than with its own variable (Doll and Torkzadeh, 1988). Campbell and Fiske (1959) suggested that violations should be less than 50% of the potential comparisons.

5. RESULT

Valid questionnaires are 173 among the 200 surveys sending out. This chapter shows data analysis, providing descriptive analysis, Cronbach's Alpha Test of Reliability as well as scale reduction and test of reliability and validity.

5.1. Descriptive analysis

5.1.1. Summary of demographic information

Table 9 Gender distribution

Gender	Frequency	Percent	Cumulative Percent
Male	105	60,7%	60,7%
Female	68	39,3%	100%
Total	173	1	

Table 10 Age distribution

Age	Frequency	Percent	Cumulative Percent
18 or below	4	2,3%	2,3%
19~28	114	65,9%	68,2%
29~38	39	22,5%	90,8%
39 or above	16	9,2%	100,0 %
total	173	100,0%	

Table 11 Education Background

Education	Frequency	Percent	Cumulative Percent
High school or below	7	4,0%	4,0%
Junior college diploma	38	22,0%	26,0 %
Undergraduate degree	95	54,9%	80,9 %
Graduate degree or above	33	19,1%	100,0 %
Total	173	100,0%	

Table 12 Occupation

Occupation	Frequency	Percent	Cumulative Percent
Business (enterprise) managerial and technical personnel	35	20,2%	20,2%
Government officer	45	26,0%	46,2 %
Professional (science and education, cultural, health)	32	18,5%	64,7 %
Student	39	22,5%	87,3 %
Self-employed	7	4,0%	91,3 %
Worker	9	5,2%	96,5 %
Unemployed people	1	0,6%	97,1 %
Others	5	2,9%	100,0 %
Total	173	100,0%	

Table 13 Salary per month

Salary	Frequency	Percent	Cumulative Percent
Below 1000	37	21,4%	21,4%
1000-3000	92	53,2%	74,6 %
3000-5000	37	21,4%	96,0 %
Above 5000	7	4,0%	100,0%
Total	173	100,0%	

What can be seen from Table 8 to Table 12 is the demographic information about users investigated in this study. As shown in Table 8, there are 60, 7% of male users while 39, 3% online banking users are female in this research. As can be seen in Table 9, 65, 9% of users are between age 19 and 28, and 22, 5% in the age between 29 and 38 which is understandable in accordance with the criterion of target group aged between 19 and 38. Even though, majority of users are younger age between 19 and 28. According to Table 10, 54, 9% of respondents have bachelors' degree, and 22% have junior college diplomas. The proportion of users having graduate degrees or above is 19, 1% that is almost the same as those having Junior college diplomas. As a result, online banking services are very popular with users having higher education background: minimum junior college diploma or equivalent. From Table 11, online banking services are very popular with users working in different areas because proportion of each of those users working as business managerial and technical personnel, government officers and professionals are around 20%. Except students that account for 22, 5%, it seems that others not having superior and stable job, like self-employed are not interested in online banking services. As can be seen from Table 12, users of salary higher than 5000 do not show much interest in using online banking. It is understandable that users with young age normally cannot get so higher income per month in Bozhou city.

5.1.2. Analysis concerning the information of using online banking as a user

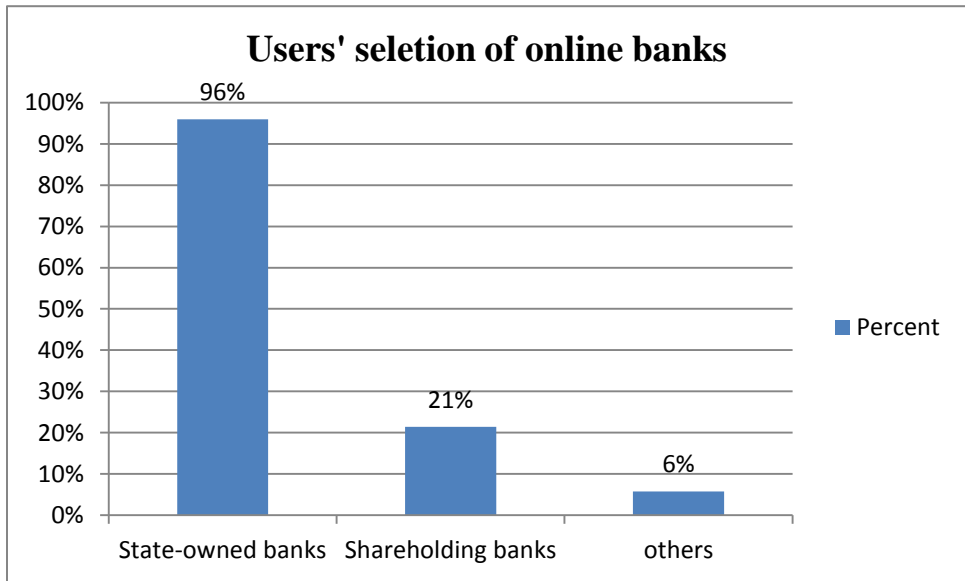


Figure 6 Users' selection of online banks

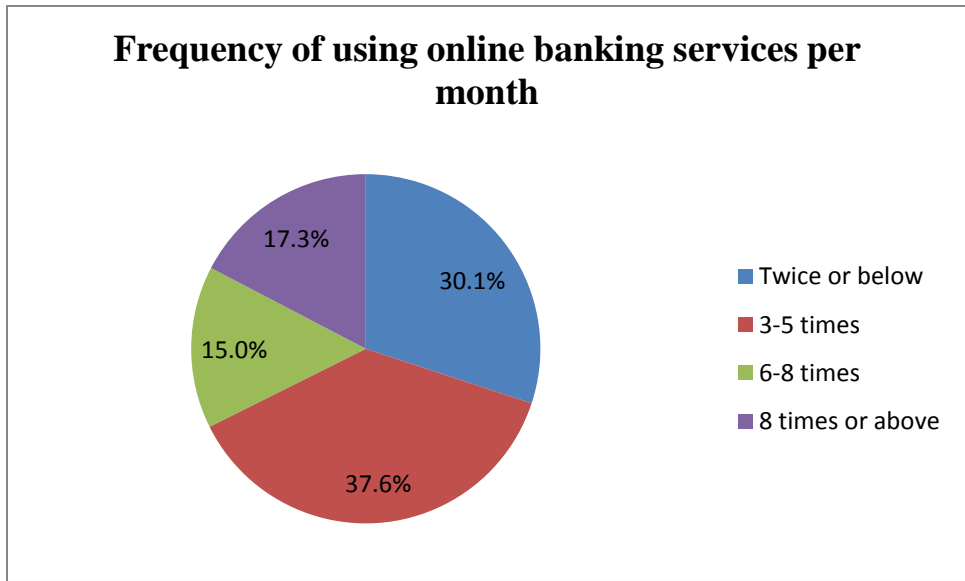


Figure 7 Frequency of using online banking services

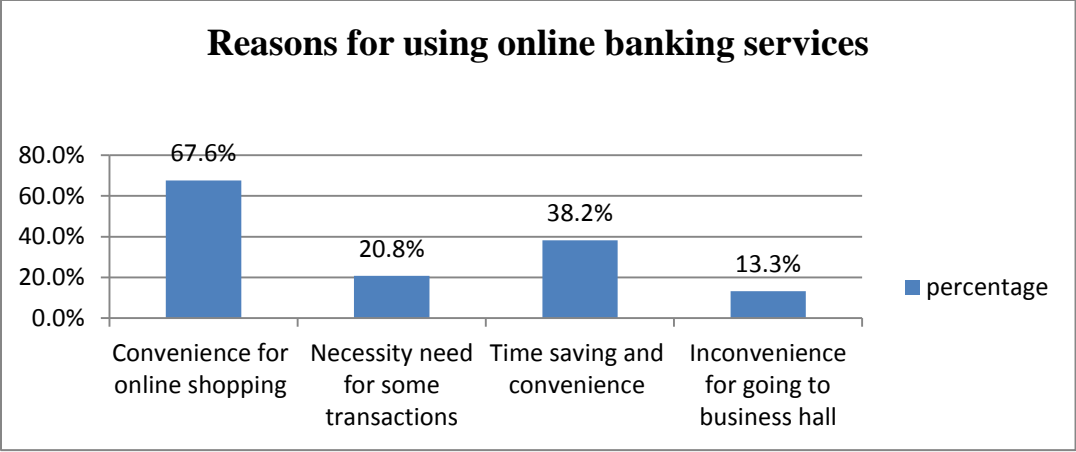


Figure 8 Reasons for using online banking services

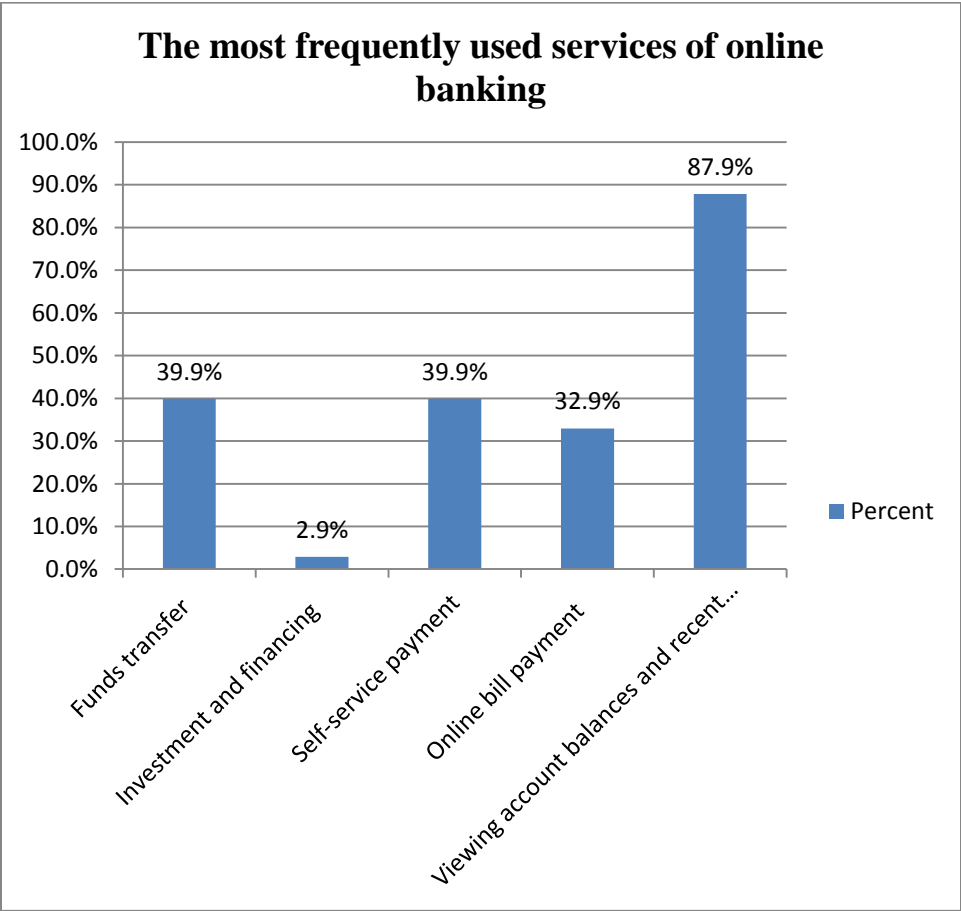


Figure 9 The most frequently used services of online banking

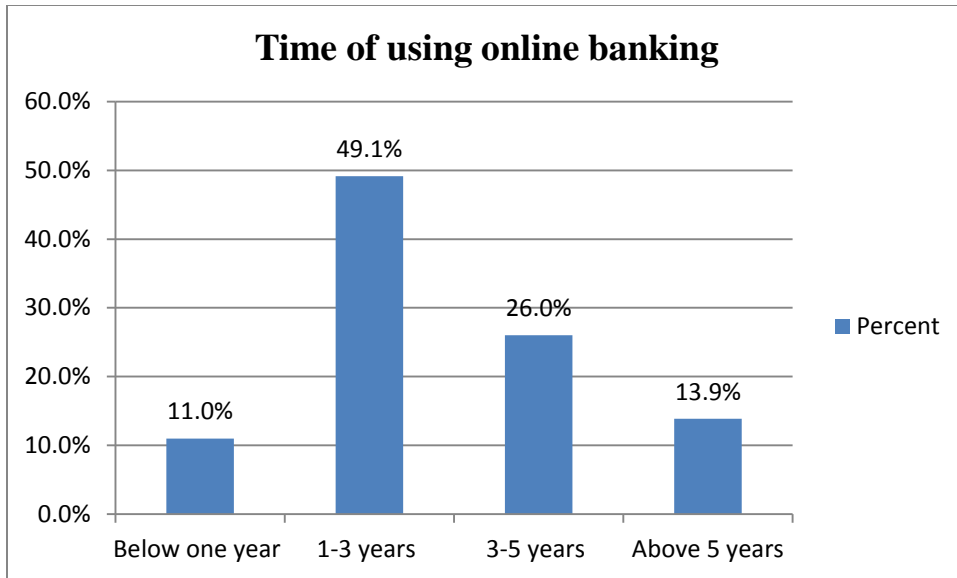


Figure 10 Time of using online banking

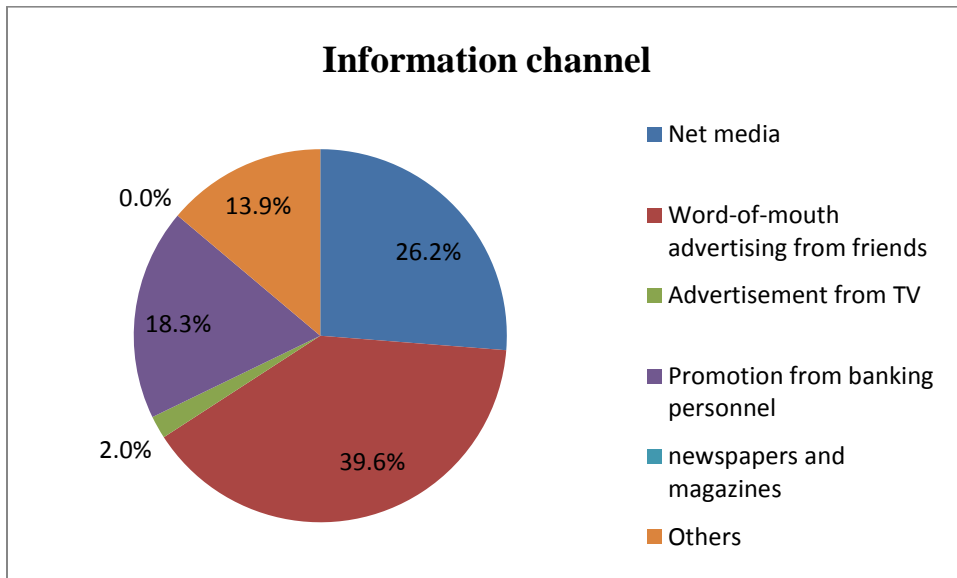


Figure 11 Information channel

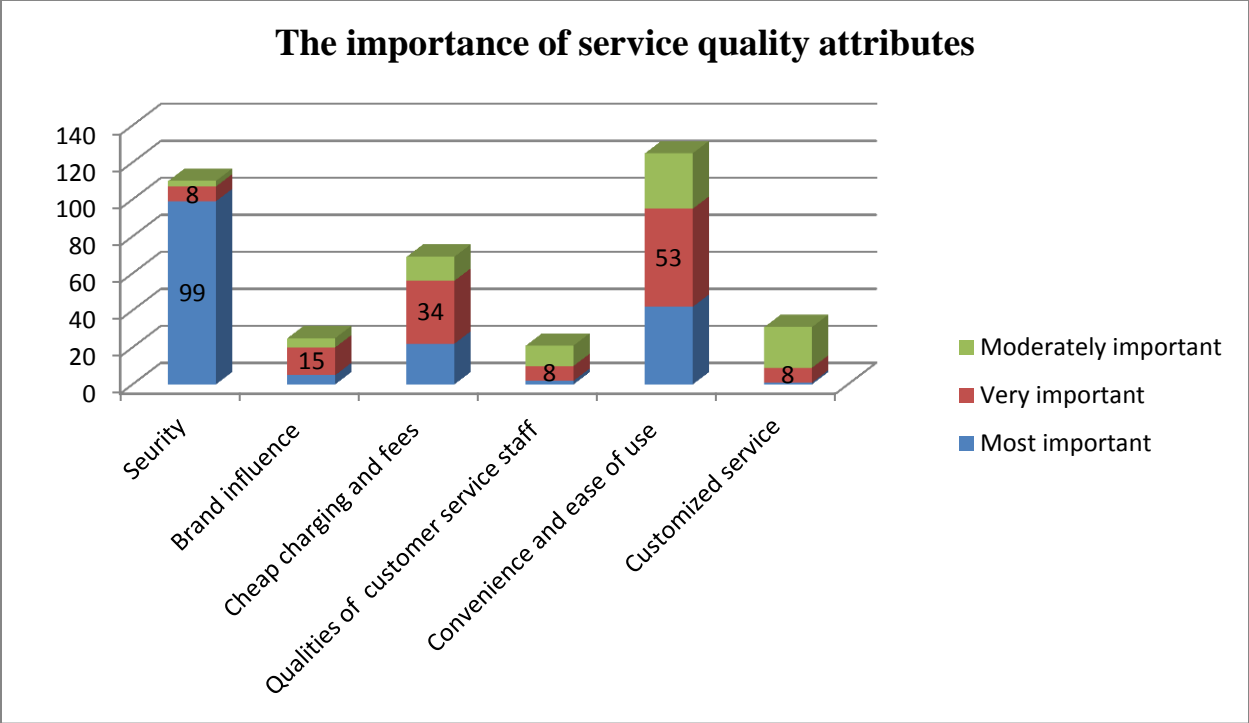


Figure 12 The importance of service quality attributes

What can be seen from Figure 6 to Figure 12 creates the profile about the information of using online banking as a user. From Figure 6, we can see that most of users that account for 96% would like to choose state-owned banks, and 21% choose shareholding banks. According to Figure 7, 37, 6% of respondents use online banking 3-5 times per month and 30, 1% use online services twice or below. Accordingly, most of users do not use online banking so often every month so that improvement of online banking service needs to be done according to customers' needs. As can be seen from Figure 8, most of users prefer to use online banking mainly because of its convenience for online shopping which is 67,6% and time saving which account for 38, 2%. Figure 9 shows us the most frequently used service of online banking is to view account balances and recent transactions, followed by fund transfer and self-service payment as well as online bill payment. The less popular service is investment and financing online which only has 2, 9% of users. Therefore, investment and financing is promising in developing online banking. Figure 10 presents that 49, 1% of users have 1-3 years' experience of online banking services and 26% use it for 3-5 years. This result is quite good as a large portion of respondents in this study have more

than 1 years' using experience of online banking, indicating they have enough experience and be qualified to evaluate the online banking services. Then from Figure 11, we can see most of respondents' acknowledgement of online banking came from friends (39, 6%) and net media (26, 2%), followed by promotion from bank personnel and advertising from TV. Accordingly, we can see how effective really word-of-mouth advertising from friends and net media is. Besides net media, it is a good way to do the promotion through the original customers that banks have had already by providing some preferential treatment. The last one Figure 12 shows us the most important quality attributes (maximum three) users pay more attention to when they use online banking. As can be seen from Figure 12, the most important one is security, followed by convenience and ease of use in users' mind.

This descriptive analysis shows a picture of users' profile and their behavior to use online banking. As can be seen from the previous part, this group represents online banking younger and middle age (19-39) users in Bozhou. Accordingly, the summary of this part can help to have a good understanding of the target group. Some data is not so precisely collected due to small sample.

5.2. Cronbach's alpha test of reliability

The Cronbach's Alpha Test of Reliability is conducted on each dimension to test the internal reliability or consistency of different items pertaining to different dimensions. Application of the Cronbach's Alpha Test of Reliability is to ensure whether those items belonging to each dimension can be used to measure the same construct. As mentioned before, the criteria of Cronbach α -score is defined to be greater than 0.7, implying the higher internal reliability of given items in a scale (Nunnally and Bernstein, 1994). As can be seen from Table 9 which is the summary of the appendix 3, α -score belonging to each construct is tested.

What can be seen from Table 14 that α -score of most of the dimensions, including efficiency, privacy, assurance/trust, website design as well as empathy are higher than 0.7, indicating that

items pertaining to those dimensions are internal consistent and reliable enough to measure the original named dimensions.

However, α -score on dimension: responsiveness is much lower than 0.7 that is only 0.510. As a result, there are some problems for this dimension when performing the Cronbach's Alpha Test of Reliability. In fact, as mentioned before, we have sent and taken 200 questionnaires back in total but only 173 of them could be used for survey analysis. This is because there are some missing data on the dimension of responsiveness from around 20 questionnaires. As mentioned in previous studies (Parasuraman et al., 2005), probably because some users did not experience the issues related to dimension of responsiveness. In other words, it seems that those users did not encounter such problem while others had experience of problems provided by online banking. In addition, the less items it has, the lower α -score it is. As a result, it probably explains why such lowest α -score on the dimension of responsive could be gotten.

As a whole, the internal reliability of this survey is good based on Cronbach's Alpha Test. In other words, items pertaining to those dimensions are internal consistent and reliable to measure the original named dimensions.

Table 14 Cronbach's Alpha Test

Dimensions	Cronbach's Alpha
Efficiency	0.802
Privacy/Trust	0.807
Responsiveness	0.510
Assurance	0.801
Website design	0.789
Empathy	0.805
Compensation	0.868

5.3. Scale reduction

After checking the internal reliability of different items pertaining to different dimensions, the internal consistency for the whole model is specified in order to check whether all the items pertaining to service quality of online banking can express the same ideas and measure the same thing as a whole.

Table 15 Cronbach's Alpha Test of Reliability

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.946	.947	29

Table 16 Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EF1	100.10	225.329	.426	.	.946
EF2	100.26	224.077	.470	.	.945
EF3	100.64	220.653	.561	.	.944
EF4	100.46	221.922	.590	.	.944
EF5	100.37	222.584	.603	.	.944
EF6	100.42	218.748	.725	.	.943
P1	100.82	216.628	.624	.	.944
P2	100.79	218.915	.633	.	.943
P3	100.47	220.870	.610	.	.944
P4	100.66	220.880	.613	.	.944
P5	100.24	227.890	.380	.	.946
R1	100.77	220.601	.569	.	.944
R2	100.83	214.995	.674	.	.943
A1	100.60	221.492	.667	.	.943
A2	100.85	223.423	.487	.	.945
A3	100.49	220.275	.637	.	.943
A4	100.51	220.801	.678	.	.943
A5	100.40	219.819	.699	.	.943
W1	100.41	221.822	.619	.	.944
W2	100.55	220.143	.674	.	.943
W3	100.61	217.701	.692	.	.943
W4	100.65	222.579	.600	.	.944
E1	100.51	221.877	.568	.	.944
E2	100.47	221.408	.583	.	.944
E3	100.51	220.918	.613	.	.944
E4	100.36	222.138	.592	.	.944
E5	100.34	224.121	.545	.	.944
C1	100.82	216.078	.635	.	.944
C2	100.99	216.918	.585	.	.944

Firstly, internal consistency is checked in order to show whether all the items are correlated with each other. This method for scale reduction of service quality was developed and used by Parasuraman et.al (1988). As can be seen from Table 15 and Table 16, although the coefficient α -score is 0.946, much higher than criteria mentioned above, the item-to-total correlation for P5 is lower than the acceptable minimum value of 0.4. On one hand, it means the item P5 (It offers several of security tools e.g. U dun, dynamic password) cannot play a good role for internal reliability statistically. On the other hand, Users did not concentrate on how many kinds of security tools bank could offer or what bank could offer, but cared about whether tools were easy and ease of use from the experience of my internship. Finally, P5 is deleted to improve the level of α -score which means reliability. From this first step, the reliability is conducted by checking the item-to-total correlations and pruning the list of items to improve the level of α -score. After elimination of item P5, the new Table 17 item-to-total statistics is shown as below. The item-to-total correlation of other items meets the requirement after deletion of item P5.

Table 17 Item-to-total

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
EF1	96.20	217.189	.415	.565	.946
EF2	96.36	215.998	.458	.610	.945
EF3	96.74	212.335	.561	.461	.944
EF4	96.56	213.687	.586	.470	.944
EF5	96.47	214.262	.602	.602	.944
EF6	96.52	210.427	.728	.696	.943
P1	96.92	208.309	.627	.643	.944
P2	96.89	210.707	.630	.602	.944
P3	96.57	212.679	.605	.586	.944
P4	96.76	212.533	.614	.516	.944
R1	96.87	212.233	.572	.478	.944
R2	96.93	206.580	.681	.716	.943
A1	96.70	213.216	.665	.644	.943
A2	96.95	214.980	.490	.375	.945
A3	96.59	211.798	.645	.605	.943
A4	96.61	212.649	.671	.625	.943
A5	96.49	211.550	.698	.624	.943
W1	96.51	213.503	.619	.541	.944
W2	96.65	211.796	.676	.601	.943
W3	96.71	209.365	.696	.628	.943
W4	96.75	214.177	.603	.565	.944
E1	96.60	213.550	.568	.572	.944
E2	96.56	213.066	.583	.570	.944
E3	96.61	212.578	.615	.579	.944
E4	96.46	213.934	.586	.545	.944
E5	96.44	215.874	.539	.567	.944
C1	96.92	207.689	.641	.768	.944
C2	97.09	208.541	.590	.686	.944

Secondly, the most important part is to test the model established in theoretical part and explore the scales of service quality in online banking of China through factor analysis. Factor analysis has been explained in detail in the previous chapter, so here is a brief introduction. There are two stages for factor analysis: PCA (Principal Component Analysis) as an extraction method and Varimax with Kaiser Normalization as the rotation method as well. In other words, PCA plays the role as identifying the initial number of factors while Varimax with Kaiser Normalization is used to decide the final number of factors and give the suitable interpretation or definition for them. It is noteworthy that KMO and Bartlett's Test should be done to insure whether factor analysis is considered to be appropriate for the research.

As can be seen from Table 18, p-value from Bartlett's Test is less than 0.05 and KMO index for this data is 0.914 and is much higher than the acceptable value 0.5. Accordingly, KMO and Bartlett's Test is considered as "meritorious" (Hair et al., 1998) for this research. As a result, factor analysis can be conducted based on this acceptable result from KMO and Bartlett's Test.

Table 18 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.914
Bartlett's Test of Sphericity	Approx. Chi-Square
	2.794E3
	df
	378
	Sig.
	.000

Table 19 Principal Component Analysis for the first time

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.616	41.487	41.487	11.616	41.487	41.487	3.920	13.999	13.999
2	1.924	6.872	48.358	1.924	6.872	48.358	3.584	12.799	26.799
3	1.426	5.092	53.450	1.426	5.092	53.450	3.301	11.788	38.586
4	1.175	4.196	57.646	1.175	4.196	57.646	2.972	10.615	49.202
5	1.149	4.105	61.751	1.149	4.105	61.751	2.410	8.606	57.808
6	1.029	3.675	65.425	1.029	3.675	65.425	2.133	7.618	65.425
7	.979	3.496	68.922						
8	.890	3.179	72.101						
9	.795	2.840	74.941						
10	.699	2.498	77.439						
11	.635	2.268	79.707						
12	.556	1.986	81.693						
13	.545	1.945	83.638						
14	.482	1.720	85.358						
15	.447	1.598	86.956						
16	.421	1.504	88.460						
17	.419	1.498	89.958						
18	.378	1.349	91.307						
19	.354	1.263	92.570						
20	.329	1.175	93.745						
21	.294	1.050	94.795						
22	.280	1.002	95.796						
23	.247	.883	96.679						
24	.223	.795	97.474						
25	.212	.756	98.230						
26	.199	.712	98.943						
27	.167	.597	99.539						
28	.129	.461	100.000						

Next, factor analysis can be conducted. As can be seen from Table 19, PCA helps to make the initial decision of the number of factors. Six factors are extracted at this stage depending on the eigen value which should be above 1.0 and those factors can explain 65.425% of the variance. Furthermore, the factor loading of retained variables is preferably higher than 0.5 for further analysis through the second stage: rotation according to the proposal of some authors (Jayawardhena, 2004). The results are shown in Table 20. Those items A4, W4 and EF4 have the factor loading below 0.5 in accordance with the standard. Firstly, A4 (Customer service personnel have good service attitude) was found to be less important because users did not get used to non-face-to-face communication with service personnel in Bozhou. At this point, A4 could be deleted. Secondly, Figure 8 has showed us the most frequently used service of online banking is to view account balances and recent transactions, followed by fund transfer and self-service payment as well as online bill payment, thus W4 (The information provided by website is always updated in time) is not be focused on from users' view. W4 could be deleted as well. Thirdly, EF4(It makes it easy to get anywhere on the site) was found to be less important because customers did not use too many online banking services which could be got from Figure 8. EF4 is deleted. In addition, items with factor loading above 0.3 on three or more factors should be deleted for better analysis (Doll and Torkzadeh, 1988) in order to improve the distinction. According to this criterion, items W2, W1, E5, E1 and EF3 are deleted as well. In the end, there are 20 items left after the first round of factor analysis.

Table 20 Rotated component matrix^a

	Component					
	1	2	3	4	5	6
A3	.749	.215	.198	.142	.059	.143
EF6	.722	.226	.270	.169	.222	.134
W3	.649	.252	.283	.227	.032	.192
A5	.594	.227	.341	.277	.238	.004
W2	.573	.160	.136	.363	.336	.144
A4	.439	.411	.277	.187	.172	.160
W4	.404	.339	.207	.281	.006	.235
P3	.176	.794	.248	.085	.121	.016
P1	.321	.752	.085	.085	.052	.204
P4	.072	.659	.223	.246	.182	.179
P2	.460	.612	-.038	.133	.257	.113
A1	.250	.591	.308	.231	.052	.177
E3	.339	.185	.712	.149	.115	-.016
E2	.085	.254	.694	.304	.158	-.015
E4	.196	.137	.629	.131	.156	.287
EF5	.233	.107	.590	.071	.352	.262
W1	.381	.168	.552	.070	.020	.350
EF4	.282	.190	.417	.023	.271	.388
C1	.304	.265	.118	.727	-.069	.227
C2	.298	.217	.023	.703	-.087	.333
E5	.081	-.018	.314	.662	.430	.054
E1	.159	.149	.316	.592	.336	-.040
R2	.391	.373	.133	.568	-.104	.271
EF2	.158	.106	.170	.128	.812	.030
EF1	.090	.161	.212	-.053	.774	.129
A2	.254	.073	.126	.195	.029	.701
EF3	-.048	.326	.329	.225	.124	.627
R1	.246	.291	.005	.136	.427	.521

Thirdly, a new round of factor analysis continues using the remaining 20 items. As shown in Table 21, four dimensions are decided initially explaining 63.393% of variance in the second round. Then, items W3 and A3 have the factor loading less than 0.5. W3 (Matters relating to customer interests and rights are prominently presented on the website) is not important according to national conditions of China. A3 (Customer service personnel have good professional knowledge and ability) is deleted for the same reason as A4. Besides, items A5, A1 and R1 having the factor loading above 0.3 on three or more factors are also deleted. Accordingly, there are 15 items left after the second round. The results are shown in Table 22.

Table 21 Second round of PCA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.566	42.831	42.831	8.566	42.831	42.831	3.573	17.866	17.866
2	1.811	9.053	51.884	1.811	9.053	51.884	3.499	17.493	35.358
3	1.260	6.298	58.182	1.260	6.298	58.182	3.475	17.377	52.736
4	1.042	5.210	63.393	1.042	5.210	63.393	2.131	10.657	63.393
5	.943	4.717	68.110						
6	.865	4.327	72.436						
7	.732	3.662	76.098						
8	.597	2.984	79.082						
9	.575	2.876	81.957						
10	.540	2.700	84.658						
11	.451	2.256	86.914						
12	.395	1.975	88.890						
13	.392	1.958	90.847						
14	.385	1.925	92.772						
15	.297	1.483	94.255						
16	.290	1.449	95.704						
17	.269	1.345	97.048						
18	.235	1.174	98.222						
19	.195	.976	99.198						
20	.160	.802	100.000						

Table 22 Second round rotated component matrix^a

	Component			
	1	2	3	4
E3	.816	.202	.138	.083
E2	.677	.234	.100	.127
EF5	.660	.073	.192	.414
E4	.631	.140	.218	.211
A5	.556	.303	.350	.203
EF6	.538	.331	.421	.230
W3	.475	.411	.438	.042
A3	.430	.380	.411	.076
P1	.155	.807	.260	.067
P3	.304	.786	.083	.081
P2	.111	.712	.294	.235
P4	.244	.651	.204	.184
A1	.338	.530	.328	.137
C2	.129	.168	.858	.031
C1	.220	.187	.823	.047
R2	.274	.325	.761	-.013
A2	.163	.173	.514	.181
EF1	.254	.158	-.059	.814
EF2	.266	.085	.082	.809
R1	.033	.391	.352	.565

Next, a new round of PCA is conducted using the rest of 15 items. As shown in Table 23, the third round of analysis extracts three factors than can explain 62.085% of the variance. In the third round of rotation, the factor loading of EF6 is less than 0.5. EF6 (It is possible to use online banking utilities without a lot of effect) needs to be deleted because it expresses the similar meaning with the previous two items EF1 and EF2. After this round, there are still 14 items remaining for further study.

Table 23 Third round of PCA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.327	42.177	42.177	6.327	42.177	42.177	3.296	21.976	21.976
2	1.772	11.815	53.992	1.772	11.815	53.992	3.169	21.124	43.100
3	1.214	8.093	62.085	1.214	8.093	62.085	2.848	18.985	62.085
4	.950	6.336	68.422						
5	.828	5.519	73.941						
6	.672	4.483	78.424						
7	.580	3.869	82.292						
8	.510	3.400	85.693						
9	.430	2.869	88.562						
10	.397	2.648	91.210						
11	.327	2.178	93.388						
12	.291	1.939	95.327						
13	.276	1.840	97.167						
14	.248	1.655	98.822						
15	.177	1.178	100.000						

Table 24 Third rotated component matrix^a

	Component		
	1	2	3
EF5	.764	.293	.113
EF2	.733	-.035	.183
EF1	.728	-.185	.247
E3	.644	.348	.183
E4	.611	.366	.109
E2	.576	.282	.176
EF6	.495	.444	.371
C2	.064	.836	.210
C1	.144	.832	.217
R2	.141	.800	.346
A2	.210	.503	.168
P1	.119	.290	.809
P3	.251	.170	.791
P2	.194	.241	.766
P4	.279	.249	.649

Finally, the fourth round of factor analysis is shown in Table 25 and Table 26. In this round of PCA, three factors are extracted which can explain 62.697% of the variance. Besides, All factor loading of the remaining 14 items are higher than 0.5. Accordingly, the remaining 14 items are reorganized into three new dimensions that help to make the final decision.

Table 25 Fourth round of PCA

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.795	41.396	41.396	5.795	41.396	41.396	3.064	21.884	21.884
2	1.771	12.647	54.043	1.771	12.647	54.043	2.992	21.371	43.255
3	1.212	8.654	62.697	1.212	8.654	62.697	2.722	19.443	62.697
4	.949	6.776	69.474						
5	.818	5.846	75.320						
6	.649	4.638	79.958						
7	.542	3.869	83.827						
8	.466	3.328	87.154						
9	.429	3.065	90.220						
10	.345	2.462	92.682						
11	.293	2.093	94.775						
12	.286	2.045	96.820						
13	.256	1.828	98.649						
14	.189	1.351	100.000						

Table 26 Fourth rotated component matrix^a

	Component		
	1	2	3
EF5	.758	.292	.114
EF1	.733	-.179	.250
EF2	.730	-.035	.186
E3	.642	.349	.183
E4	.618	.373	.111
E2	.584	.292	.175
C2	.065	.839	.211
C1	.148	.837	.220
R2	.137	.798	.347
A2	.205	.500	.171
P1	.118	.291	.811
P3	.256	.175	.791
P2	.182	.232	.768
P4	.289	.257	.648

Consequently, three dimensions are got for online banking services in China, it can be shown in the table below. Items EF5, EF1, EF2, E3, E4, and E2 are the component for the new dimension defined as customer experience design. In fact, this new dimension is mainly composed of original two dimensions defined in the theoretical model: efficiency and empathy. Customer experience design is the renamed dimension relating to the real experience and feeling of online banking services from customer perspective, such as the speed of information and transaction processing as well as the speed of accessing to website information needed and “the providing of

caring, individualized attention to customers” (empathy). Those items C2, C1, R2 and A2 belong to the new renamed dimension preferential and assurable treatment. As can be seen that preferential and assurable treatment is related to favorable treatment offering and guarantee providing for assurance as well as responsiveness to the problems, such as more favorable price offering (such as the service charge for fund). The last dimension is privacy/trust composed of items P1, P2, P3 and P4. This dimension is related to “the confidence the customer feels in dealing with the site” (from the first stage development of E-SQ) and “the degree to which the site is safe and protect customer information” (the same dimension from E-SQ).which is the combination of assurance/trust and security/privacy. Finally, the refined scale is got and shown in the Table 27.

Table 27 Refined scale for online banking services in China

Content of service attributes	New Dimensions
EF1.This site can process information and transaction quickly	Customer experience design
EF2.A user can get the information from the website that is needed easily and quickly	
EF5. The information provided by the website is easily understandable and ease of handling.	
E1.This website can provide customized services;	
E2.Online banking offers full information about features of various products or services (e.g. fund, stock);	
E4.It offers a variety of electronic statements query	
R2.This site can provide adequate remedy to deal with the problems (e.g. different kinds of solutions)”;	Preferential and assurable treatment
A2.The system is stable and reliable which would not have the situation of transaction termination;	
C1.The online banking can provide preferential rates and charging fees;	
C2.The online banking can charge reasonable fees (transaction fees)	
P1 This site can protect personal information of users and no misuse;	Privacy/trust
P2.The site protects information about my bank cards;	
P3.Transaction can be completed in a safe mode;	
P4.A user is confidence in the online banking services.	

5.4. Reliability and validity

5.4.1. Reliability

Although the refined scale is gotten, there is still a need to test the reliability and validity of the refined model. What can be seen from Table 28 is the summary of Appendix 4 that is the α -score for all the refined dimensions as well as α -score for the whole scale. The Cronbach's Alpha for all the new constructs are 0.817, 0.838 and 0.839, indicating the items pertaining to those new constructs are internal consistent and reliable enough. In addition, the α -score for the whole scale is 0.888, showing the high internal consistency and reliability among all the items pertaining to service quality of online banking as a whole. Accordingly, the refined scale is regarded as high reliable measurement for online banking service in China.

Table 28 Reliability Statistics for refined scale

Dimensions	Cronbach's Alpha
Customer experience design	.817
Preferential and assurable treatment	.838
Privacy/trust	.839
Total	.888

5.4.2. Validity

As mentioned in the previous content, construct validity is applied in this thesis. Furthermore, convergent and discriminatory validity are considered as subsets of construct validity. Firstly, convergent validity is tested through CFA. Typically, tool: Amos of SPSS is used for performing convergent validity. The statistical tools used for this study are SPSS(not including Amos version) and Excel, however, the same result can be gotten by performing process of the

extraction mentioned previous(numbers of factor=1) (Wu, http://tx.liberal.ntu.edu.tw/Jx/Methodology/Analy-TxStatisticsCanon-Factor_CFA.htm#PCA, 20.05.2013). As can be seen from Appendix 5, the factor loadings of most of the items are higher than 0.5 except item EF1 that is a little bit lower than 0.5.

Next, the discriminatory validity is performed for assessing construct validity by using the multitrait-multimethod approach. According to Doll and Torkzadeh (1988), discriminatory validity is examined by counting the number of violations that an item's correlation with another constructs is quiet higher than with its own variable. As can be seen from Appendix 6, the lowest correlations within the same construct are shown as below: Correlation(E4,EF1)=0.263, Correlation(A2,C1)=0.331, Correlation(P4,P2)=0.427. What can be seen from Appendix 6 is that the total number of comparisons between an item with another constructs and with its own variable is 128. Besides, the number of violations is 57. Campbell and Fiske (1959) suggested that violations should be less than 50% of the potential comparisons. Accordingly, the percentage is 44.5% ($57/128*100\%$) which is less than 50% so that the result is acceptable.

As a whole, although the factor loading of E1 is a littler lower when performing convergent validity, it can be said that the validity test of the refined scale is acceptable from both aspects of convergent and discriminatory validity.

5.5. Summary of open questions

This part analysis is composed of two open questions. Although the response rate of this part is not high, it is still helpful to learn more from users' perspective. Regarding the first open question (Which online banking service is considered to be superior in terms of service quality? Why?), most of the respondents choose four state-owned banks (Bank of China, Agricultural Bank of China, China Construction Bank and ICBC) and one extra joint-stock bank (China Merchants Bank). Accordingly, four-sated owned banks and China Merchants Bank can be considered to be superior in terms of online service quality from users' view.

Regarding the second one (any advice for improvement in the future development of online banking), users have given some good advice for improvement which is shown as below.

- Number of customer service personnel of online banking could be increased in order to serving customers more quickly and better.
- It is better to lower the fees of online banking, e.g. fees for intra-and inter-bank transfer, annual fees etc.
- It is better to establish customer feedback system for online banking service quality so that the real needs of customers could be learnt and updated by time.
- Security and ease of use needs to be improved and paid more attention to continually.

5.6. Summary

Survey analysis has been done in this chapter. Descriptive analysis provided the overall picture of target group comprising of enough experience users. Statistical analysis showed the process of scale reduction and test of reliability and validity, and finally the refined scale was identified including 3 dimensions and 14 items: Customer experience design, preferential and assurable treatment as well as privacy/trust. Open questions offered the chance to learn what the customers thought and advices for improvement in the future.

6. DISCUSSION AND CONCLUSION

6.1. Theoretical and empirical contribution

The purpose of this study is to develop service quality dimension for online banking service in China. The research is based on E-S-QUAL/E-Rec S-QUAL instrument which is considered to be one of the most comprehensive measurement to evaluate online services, involving the users' experiences before (which can be understood as evaluation of website quality), during (purchasing process) and after the transaction process (after-sales service). The empirical data was collected by sending and gathering questionnaires in Bozhou.

In the theoretical part, information of online banking development in China, the concept of service quality (including online service quality) and related models as well service quality in both contexts of online banking and traditional banking continues were discussed, especially E-S-QUAL/E-Rec S-QUAL instrument. In this study, E-S-QUAL/E-Rec S-QUAL developed by Parasuraman et.al (2005) has been modified to establish a more suitable model for online banking in Bozhou. In addition, there are several articles shown as follows that are very helpful and useful for the survey design: Wang (2009), Ho & Lin (2010), Wu et.al (2008), Zavareh^a et.al (2012). In fact, the main purpose of theoretical part is to define and establish the suitable multiple e-service item scale based on E-SERVQUAL model and other related models.

Then, from empirical part, surveys targeting users in Bozhou focus much on data collection and analysis. 200 questionnaires were sent out and collected, however, 173 of them were valid due to the missing data of certain dimensions. Next, according to the method developed by Parasuraman et al. (1988), scale refinement was done by using item-to-total correlation and factor analysis. Later, the most important step was to check the reliability and validity of refined scale. Finally, the multiple item scale for measuring online banking service in China was identified, including 3 dimensions and 14 items: customer service, privacy and preferential and reliable treatment.

As a whole, three dimensions of customer service, privacy and preferential and reliable treatment were investigated to be the scale for measuring online banking service quality in this study. From the descriptive analysis, security, followed by convenience and ease of use were found to be the most important dimensions. In addition, lower fees especially no fees belonging to preferential treatment were expected to be improved from open question part. As can be seen, those three factors are similar with refined three dimensions. Accordingly, the refined scale could be considered more accurate and suitable to measuring online banking service quality in Bozhou city of China. Table 29 shows the differences among E-SERVQUAL (2000), E-S-QUAL/E-Rec S-QUAL, revised e-SQ scale and the refined scale.

Table 29 Differences among E-SERVQUAL, revised e-SQ scale and the refined scale

E-SERVQUAL (2000)	E-S-QUAL/E-Rec S-QUAL (2005)	The revised e-SQ scale	The refined scale
Reliability	Fulfillment, System Availability	–	–
Responsiveness	Responsiveness	Responsiveness/contact	Preferential and assurable treatment (R2)
Access	Efficiency, contact	Efficiency(EF3)	–
Flexibility		Website Design (W1)	–
Ease of navigation	Efficiency	Efficiency (EF1, EF2,EF4,EF5,EF6)	Customer experience design (EF1, EF2, EF5)
Efficiency	Efficiency		
Assurance/Trust		Assurance Privacy/Trust(P4)	Preferential and assurable treatment (A2) Privacy/Trust(P4)
Security/Privacy	Privacy	Privacy/Trust (P1,P2,P3,P5)	Privacy/Trust (P1,P2,P3)
Price Knowledge		–	–
Site aesthetics		Website design(W2)	–
Customization/personalization		Empathy(E1)	–
	Compensation	Compensation/ preferential treatment(C1,C2)	Preferential and assurable treatment(C1,C2)

To sum up, there are some new contributions comparing with previous studies:

- In this paper, e-service quality instrument: E-S-QUAL/E-Rec S-QUAL was used as a basis instead of using traditional service quality model. All in all, traditional service is different from online service. Thus, this method is more suitable and trustful comparing with previous studies.
- This paper developed and established a reliable and valid able multiple item scales for measuring service quality of online banking in China, taking customers' points of view. As a result, service quality could be able to paid more attention towards this three aspects for better and efficient improvement.

6.2. Managerial recommendations

According to the research, the first managerial recommendation for online banking industry is to help have a good knowledge of who their customers are and what they pay more attention to. This knowledge would lay the foundation for further research on relationship between customer satisfaction and service quality and further help to target the group that is more accurate and profitable. In addition, such knowledge would help to recognize what services should be improved according to the real needs. In other words, certain services that customers do not care are no need to be paid more attention to; otherwise, it is a waste of time and money.

Then the second recommendation for management is to learn that there is a need to establish the feedback system for online banking service quality measurement, especially from part of open question. On one hand, it took more time to collect the information of service quality by sending surveys. On the other hand, doing data collection randomly was not easy for me. However, if banks could consider to establish this kind of feedback system, it is not only time-saving and more accurate, but also updated continually following the changes of users' needs.

Also, security and ease of use could not be underestimated because these two dimensions were considered to be most important. In addition, lower fees or even no fees should be paid attention to because of many complaints about this mentioned in open questions.

As a whole, all of these recommendations mentioned above try to give banks the right direction for online banking development, and help them have a better understanding of users' group as well.

6.3. Limitations and further research

Like all the other papers in academic, this thesis has its own limitations as well. Firstly, the total number of valid questionnaires that has been collected back via paper delivery is around 180 because of time limitation, so the respondent sample size is too small comparing huge users of online banking in China. Accordingly, it is better for further study to select much larger sample so as to gain a more precise analysis result. Secondly, the limitation for this thesis is the target group, which is only concentrated on age between 19 and 39. In order to gain big profits, bank providers would take an interest in our target age group, and also pay attention to older age, e.g. higher educational background. As can be known from the research done by iResearch Consulting Group in 2011(<http://wenku.baidu.com/view/ccc254200722192e4536f6d9.html>, 28.03.2013), there is 19.5% of online banking users above 40 years old in China although the main user group is still younger age. In other words, the target group of this thesis research is not comprehensive enough so that some of the perception of e-service quality of online banking could not be covered. Thirdly, accordingly to statistical inference, convenience sampling is no better than random sampling. Regarding to research about service quality of online banking, respondents who pay more attention to this issue probably would like to join and answer the survey more preferably than others (http://www.rand.org/content/dam/rand/pubs/monograph_reports/MR1480/MR1480.ch4.pdf, 10.08.2013). Accordingly, the result of survey cannot be representative within general population. Fourthly, factor analysis in this study did not have a comparison point against which to measure

what the scale is actually measuring. This kind of comparison would provide extra proof for the validity test. Fifthly, the reliability and validity test was done using the same sample. Instead, it is better to use different sample to check the reliability and validity, especially for validity test in order to get the result that is more trustful., The last one is that there is still a lack of comprehensive academic e-service quality scales for online banking, so our established model is based on E-SERVQUAL that is e-service quality scales for online shops.

In addition, this study only concentrated on measuring service quality of online banking, but did not pay attention to impact of service quality on customer satisfaction. It must be interested to do the further research on relationship between service quality and customer satisfaction.

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APPENDICES

Appendix 1 Development of online banking in China

Development Course of China's Online Banking		
Date	Feature	Major Events
Germination stage : 1996-1997	Online banking service is under development and exploration	<ul style="list-style-type: none"> ● In 1996, BOC (Bank of China) began to develop online banking ● In 1997, BOC built a website with an "online banking service system"; CMB (China Merchants Bank) launched its website;
Starting stage : 1998-2002	Major banks initiated their online banking service	<ul style="list-style-type: none"> ● In April, 1998, CMB started online banking service in Shenzhen, with a brand of "network" ● In April, 1999, CMB spread its online banking service to Beijing ● In August, 1999, BOC started its online banking service, including online information service, account inquiry, account transfer, online payment, and fund collection and payment ● In August, 1999, CCB (China Construction Bank) started its online banking service in Beijing and Guangzhou ● In 2000, ICBC started its online banking service in Beijing, Shanghai, Tianjin, and Guangzhou ● In 2001, ABC (Agricultural Bank of China) started its 95599 phone banking, and started its online banking in April, 2002 ● By the end of 2002, all state-owned banks and joint-equity banks have started online banking, among which, 21 banks have started online transaction business
Development stage : 2003-2010	Major banks began to establish their brand, improve service quality and release new products; The development of core business became a driving power of online banking service	<ul style="list-style-type: none"> ● In 2003, ICBC released its personal online banking called "financing @ home" Z In 2005, BOCOM (Bank of Communication) established a brand called "financing express" Z In 2006, ABC released an online banking brand called "e-banking" Z In 2007, the hotness of personal financing market impelled the development of online fund business, and thus promoted the business development of personal online banking ● In 2008, both online banking products and service have been up-graded, and major banks take measures to discuss and explore how to charge on online banking
Maturation stage : After 2010	Online banking law has gradually improved, and online banking business of major banks have stepped into a stable development stage	

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Source: <http://wenku.baidu.com/view/b2b76b8a680203d8ce2f2451.html>

Appendix 2 SERVQUAL

Appendix 2.1 Dimensions of Perceived service quality (SERVQUAL, 1985)

Service Quality Dimension	Definition
Reliability	Involves consistency of performance and dependability
Responsiveness	Willingness or readiness of employees to provide service (timeliness of service, giving prompt service)
Competence	Possession of the required skills and knowledge to perform the service
Access	Approach ability and ease of contact
Courtesy	Politeness, respect, consideration and friendliness of contact personnel
Communication	Keeping customers informed in language they can understand and listening to them
Credibility	Trustworthiness, believability, honesty, and having the customers' best interests at heart
Security	Freedom from danger, risk and doubt
Understanding/Knowing the customer	Making the effort to understand the customer's needs
Tangibles	Physical evidence of the service

Source: Grönroos, "Service Management and Marketing: A customer Relationship Management Approach", 2000, pp.7

Appendix 2.2 Revised Dimensions of Perceived service quality (SERVQUAL, 1988)

Service Quality Dimension	Definition
Tangibles	The appeal of facilities, equipment, material and employees which the service firm uses to deliver its services to the customer
Reliability	Consistency of performance and dependability
Responsiveness	Willingness or readiness of employees to provide service
Assurance	The knowledge and courtesy of employees and their ability to convey trust and confidence
Empathy	The providing of caring, individualized attention to customers

Source: Grönroos, "Service Management and Marketing: A customer Relationship Management Approach", 2000, pp.74

Appendix 3 Cronbach's Alpha Test of Reliability for the original model

Appendix 3.1 Reliability test for efficiency

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.802	.806	6

Appendix 3.2 Reliability test for Privacy/Trust

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.807	.801	5

Appendix 3.3 Reliability test for Responsiveness/contact

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.510	.514	2

Appendix 3.4 Reliability test for Assurance

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.801	.806	5

Appendix 3.5 Reliability test for website design

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.789	.789	4

Appendix 3.6 Reliability test for empathy

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.805	.805	5

Appendix 3.7 Reliability test for compensation

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.868	.868	2

Appendix 4 Cronbach's Alpha Test of Reliability for the refined model

Appendix 4.1 Reliability test for customer experience design

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.817	.818	6

Appendix 4.2 Reliability test for Preferential and assurable treatment

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.838	.831	4

Appendix 4.3 Reliability test for privacy/trust

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.839	.841	4

Appendix 4.4 Reliability test for all the items

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.888	.889	14

Appendix 5 CFA

	Component
	1
EF1	.451
EF2	.504
EF5	.645
E1	.612
E2	.600
E4	.627
R2	.744
A2	.511
C1	.711
C2	.665
P1	.704
P2	.691
P3	.695
P4	.691

Appendix 6 Correlation matrix of the refined service quality scale items

	EF1	EF2	EF5	E2	E3	E4	C1	C2	R2	A2	P1	P2	P3	P4
EF1	1.000	.620	.477	.305	.295	.263	.113	.065	.113	.148	.204	.279	.273	.313
EF2	.620	1.000	.438	.308	.347	.356	.239	.176	.170	.130	.187	.336	.266	.261
EF5	.477	.438	1.000	.450	.555	.561	.339	.286	.382	.299	.312	.314	.326	.372
E2	.305	.308	.450	1.000	.554	.395	.334	.299	.303	.209	.344	.242	.355	.394
E3	.295	.347	.555	.554	1.000	.514	.384	.258	.414	.273	.354	.316	.424	.381
E4	.263	.356	.561	.395	.514	1.000	.314	.307	.384	.353	.288	.313	.396	.313
C1	.113	.239	.339	.334	.384	.314	1.000	.767	.760	.331	.401	.404	.352	.379
C2	.065	.176	.286	.299	.258	.307	.767	1.000	.685	.376	.392	.389	.302	.376
R2	.113	.170	.382	.303	.414	.384	.760	.685	1.000	.388	.493	.466	.444	.455
A2	.148	.130	.299	.209	.273	.353	.331	.376	.388	1.000	.348	.287	.238	.285
P1	.204	.187	.312	.344	.354	.288	.401	.392	.493	.348	1.000	.650	.626	.543
P2	.279	.336	.314	.242	.316	.313	.404	.389	.466	.287	.650	1.000	.586	.427
P3	.273	.266	.326	.355	.424	.396	.352	.302	.444	.238	.626	.586	1.000	.582
P4	.313	.261	.372	.394	.381	.313	.379	.376	.455	.285	.543	.427	.582	1.000

Appendix 7 Survey on Measuring Service Quality in Online Banking

Part 1. Demographic information

1. Gender

Male Female

2. Age (years old)

18 or below 19~28 29~38 39 or above

3. Education background

High school diploma or below Junior college diploma Undergraduate degree
(Bachelor's degree) Graduate degree (Master's degree) or above

4. Occupation

Business (enterprise) managerial and technical personnel

Government officer Professional (science and education, cultural, health)

Student Self-employed Worker Unemployed people Others

5. Salary per month (RMB)

Below 1000 1000-3000 3000-5000 Above 5000

Part 2. Concerning the information of using online banking as a user

1. Which online banking are you used more often?

Bank of China Agricultural Bank of China China Construction Bank

Industrial and Commercial Bank of China(ICBC) Bank of Communication

China Merchants Bank China Minsheng Banking Corp.LTD

China Citic Bank Huishang Bank

2. How often do you use online banking per month?

twice or below 3-5 times 6-8 times 8 times or above

3. The main reason to use online banking

Convenience for online shopping Necessity need for some transactions

Time saving and convenience Inconvenience for going to business hall

4. Which services that online banking offers would you like to use most often? (Please select maximum 3)

Funds transfer Investment and financing Self-service payment

Online bill payment Viewing account balances and recent transactions

5. Which service quality attributes do you pay most attention to when using online banking? (Please select maximum 3 and prioritize them)

Security Brand influence cheap charging and fees (e.g. transaction fees)

Qualities of customer service staff Convenience and ease of use Customized service

6. Where do you get the information of online banking?

Net media Word-of-mouth advertising from friends Advertisement from TV

Promotion from banking personnel newspapers and magazines Others

7. How many years have you used online banking?

Below one year 1-3 years 3-5 years Above 5 years

Part 3. Service Path

Please evaluate the following service quality attributes according to your experience of using online banking.

Attributes affecting service quality	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
This site can process information and transaction quickly;					
A user can get the information from the website that is needed easily and quickly;					
It loads page quickly;					
It makes it easy to get anywhere on the site;					
It is possible to use online banking utilities without a lot of effect;					
The information provided by the website is easily understandable and ease of handling.					
This site can protect personal information of users and no misuse;					
Transaction can be completed in a safe mode;					
It offers several of security tools (U dun, dynamic password);					
This site protects information about my bank cards;					
It can deal with and solve the problems promptly;					
This site can provide adequate remedy to deal with the problems (e.g. different kinds of solutions)".					
A user is confidence in the online banking services;					
The system is stable and reliable which would not have the situation of transaction termination;					
Customer service personnel have good professional knowledge and ability;					
The information provided by website is accurate and reliable;					

The reputation and image of this online banking is good;					
Customer service personnel have good service attitude;					
This website can provide different ways of logging into online banking which is very flexible (e.g. user name, account number);					
Matters relating to customer interests and rights are prominently presented on the website;					
The site map of internet banking portal is clear, the content and picture of the portal site are user-friendly;					
The information provided by website is always updated in time.					
It offers a variety of electronic statements query;					
This website can provide customized services;					
Online banking offers full information about features of various products or services (e.g. fund, stock);					
Online banking is authorized to support and deal with a lot of business for consumers online: buying financial products online;					
This site provides the video demo showing how to use online banking utilities it offers;					
The online banking can charge reasonable fees (transaction fees);					
The online banking can provide preferential rates and charging fees.					

Part 4. Open question

1. Which online banking service is considered to be superior in terms of service quality?
Why?
2. Do you have some advice for improvement in the future development of online banking?