# Behavioural Intentions in the Malaysian Retail Banking Industry: An Empirical Analysis

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Juhaida Abu Bakar

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# Abstract


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Financial deregulation and rapid technological advancement have lead the world banking industry to a more highly competitive and complex environment. In Malaysia, the competition is not only among the local banks, but also from foreign banks and non-financial institutions. The situation has worsened because banking products and services are identical and homogenous. Given the current conditions, local commercial banks in Malaysia are exposed to customer-switching risk because customers have a variety of financial suppliers to choose from. Therefore, to stay competitive and resilient, bank customer retention is crucial. Many studies show that an increase in customer retention results in increased profitability. The main purpose of this current study is to develop a behavioural intentions model of the Malaysian retail banking industry. Behavioural intentions can act as an indicator for customer retention.

Constructs such as service quality, customer satisfaction, perceived value, corporate image and switching costs are found to be important antecedents of behavioural intentions based on past literature. A hierarchical model is used as a framework to synthesize the effects of service quality, customer satisfaction, perceived value, corporate image and switching costs on the behavioural intentions of retail bank customers. To date, no published empirical research has identified using a hierarchical model, the primary and subdimensions of retail bank service quality and linked these dimensions to behavioural intentions. This research seeks to fill this conceptual gap by examining the relationships between all five important marketing constructs (service quality, customer satisfaction, perceived value, corporate image, switching costs) and favourable behavioural intentions. All relationships are tested simultaneously in a single model.

Data sets were collected from the bank customers of two commercial banks in the Klang Valley area, Malaysia, during October, 2011. The sample frame included Malaysians who were 18 years and above. Two techniques were used to analyse the data: exploratory factor analysis and structural equation modelling. The results of this study support using a hierarchical and multidimensional approach for conceptualising and measuring customers' perceptions of service quality in the retail banking industry. In addition, the findings illustrate that customer satisfaction is an important determinant of behavioural intentions followed by switching costs, corporate image, and perceived value. The findings also indicate that there is no direct relationship between service quality and behavioural intentions. However, customer satisfaction mediates the relationship between service quality and behavioural intentions. Service quality, perceived value, corporate image are three important antecedents of customer satisfaction, with the strongest being service quality. Service quality is also an antecedent of perceived value, corporate image, and switching costs.

The findings contribute to the services marketing theory by providing additional insights into behavioural intentions, customer satisfaction, perceived value, corporate image, switching costs, service quality, and the dimensions of service quality. Also, the findings will provide Malaysian bankers with empirically-based insights into service quality and holistic ideas for assessing and improving service quality, in order to induce greater customer satisfaction, increased perceived value and improved corporate image, all of which will help to create positive behavioural intentions. Finally, the hierarchical model used to evaluate service quality will help bank managers to assess bank service quality at the overall, primary and subdimensional levels.

**Keywords:** Behavioural Intentions; Customer Satisfaction; Value; Service Quality; Corporate Image; Switching Costs; Multi-Dimensional And Hierarchical Model; Retail Banking Industry And Malaysia.

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In the name of Allah, the Most Gracious and the Most Merciful

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# Table of Contents

# List of Tables

# List of Figures

# List of Appendices

# Chapter 1
# Introduction

This chapter backgrounds the study and reviews the Malaysian banking industry. The research gaps, objectives and contributions of the study are discussed in subsequent sections. The structure of the thesis is provided in the final section of the chapter.

## 1.1 Background to the Study

The world banking industry is constantly changing and has undergone a dramatic transformation over recent years for several reasons, e.g., financial deregulation and globalisation, rapid technological advancement and changes in consumer demand for banking services (Lymperopoulos, Chaniotakis, & Soureli, 2013; Strandberg, Wahlberg, & Öhman, 2012; Claessens, 2009; Roig, Garcia, Tena, & Monzonis, 2006; Yavas, Benkenstein, & Stuhldreier, 2004). Financial deregulation and globalization have increased the cross-border expansion and allowed a more integrated worldwide banking market (Choudhury, 2013). Rapid technological advances, such as the internet, mobile phones and electronic banking, offer banking institutions new opportunities and challenges to further augment competition in the worldwide banking market. Technological advances have stimulated banks to reconsider their strategies for the services they offer to their customers (Choudhury, 2013; Angur, Nataraajan, & Jahera, 1999). As a result, a greater variety and choice of products and services for customers are available and the banking industry is offering sophisticated delivery systems and more value-added services (Çalik & Balta, 2006; Beerli, Martín, & Quintana, 2004).

All these dramatic transformations have led to a more highly competitive and complex environment in the banking industry (Laksamana, Kingshott, & Muchtar, 2013; Narteh, 2013a). Thus, banks have realized the importance of being distinct from their competitors through maintaining superior customer service (Kumar, Kee, & Charles, 2010; Beerli et al., 2004) as well as developing effective defensive marketing strategies (i.e., a focus on retaining existing customers). Earlier, banks were more focused on the traditional offensive strategy (i.e. attracting new customers) just to stay competitive (Roig, Guille´n, Coll, & Saumell, 2013; Gounaris, Dimitriadis, & Stathakopoulos, 2010).

Defensive marketing involves maximising customer retention rates by protecting products and markets from competitors (Fornell & Wernerfelt, 1987). Research has shown

that defensive strategies can be more profitable because of an increase in cross selling and positive word-of-mouth communication (Tsoukatos & Rand, 2006). Malaysia, an emerging economy, has also experienced the banking transformation and several researchers have discussed the issue (Amin, Isa, & Fontaine, 2013; Kumar, Kee, & Manshor, 2009; Guriting & Ndubisi, 2006; Ndubisi, 2006). The following section reviews the Malaysian financial system and discusses the banking industry in Malaysia. That section is followed by a discussion of the research gaps, the objectives and the contributions of this study to the service marketing literature.

### 1.2 Overview of the Malaysian Banking Industry

The financial system in Malaysia is divided into two categories: financial institutions and financial markets. The financial institutions comprise the banking system and the non-bank financial intermediaries. The financial market comprises four major markets: the money and foreign exchange market, the capital market, the derivatives market and the offshore market.

The banking system comprises the central bank (Bank Negara Malaysia), commercial banks (local and foreign) and several important non-financial institutions (discount houses), which are closely connected to the monetary institutions (Mokhlis, Salleh, & Nik Mat, 2009). The banking system in Malaysia is unique because it comprises a dual banking system having a combination of non-Islamic and Islamic banks (Taap, Chong, Kumar, & Fong, 2011; Ameer, 2008). Malaysia has been successful in executing a dual banking system and appears to be the first country to have a fully-fledged Islamic banking system operating side by side with the conventional banking system (Ismail, Majid, & Rahim, 2013).

Commercial banks are the largest and most significant group among the financial institutions listed and they play a vital role in the Malaysian economy because they provide a major source of financial intermediation (Mokhlis et al., 2009). As of December 2014, the total assets of the commercial banks were approximately MYR[1] 1,718,479.40 billion[2]. In 2010, total assets of the commercial banks accounted for about 67% of the financial system (Bank Negara Malaysia, December 2010) with Maybank reported as the largest commercial bank and first in the domestic market (Ahmad, 2013). Overall, Malaysia's financial landscape has undergone tremendous change since independence in 1957. The country witnessed bank

[1] Malaysian Ringgit
[2] http://www.bnm.gov.my/index.php?ch=en_publication_catalogue&pg=en_publication_msb&mth=12&yr=2014&lang=en&eId=box1

mergers as early as 1932, then again in the late 1960s, the early 1990s, and peaking in 2000 as a result of the 1997 Asian financial crisis (Sufian & Habibullah, 2013; Shanmugam & Nair, 2004). Following the Asian financial crisis, the Malaysian government took special measures to ensure the survival of the major banks (Ameer, 2008; Sufian, 2004).

In July 1999, the central bank of Malaysia (Bank Negara Malaysia) announced a merger and acquisition plan and in 2000, 10 anchor banking groups[3] were formed. The formation resulted in a sharp decline in the number of banking institutions from 58 to 29 (i.e., 10 commercial banks, 10 finance companies and nine merchant banks). With 58 players in the market (pre-merger), Malaysia's banking system was considered as "over-banked" and fragmented by the government (Chong, Liu, & Tan, 2006). The merger and acquisition plan lessened the number; they transformed into larger and better-capitalized local banks.

As at May 2014, the number of anchor banks has reduced to eight through additional mergers and acquisitions between the Bumiputra Commerce Bank and the Southern Bank Berhad (became CIMB)[4] in 2006, and the Hong Leong Bank Berhad and the EON Bank Berhad[5] in 2011. The main idea of this plan is to ensure local banks, are capable of withstanding competition and pressures from foreign banks due to financial liberalization, technological advances, and financial innovation challenges (Ahmad, 2013; 2012; Sufian & Habibullah, 2013; Shanmugam & Nair, 2004).

**Table 1.1: The Number of Financial Institutions in Malaysia as at May, 2014[6]**

| Financial Institution Type | Malaysian Controlled | Foreign Controlled | Total |
|---|---|---|---|
| Commercial Banks | 8 | 19 | 27 |
| Islamic Banks | 10 | 6 | 16 |
| International Islamic Banks | - | 5 | 5 |
| Investment Banks | 15 | - | 15 |
| Other Financial Institutions | 2 | - | 2 |
| **Total** | **35** | **30** | **65** |

[3] The 10 anchor banking groups are: Malayan Banking Berhad, RHB Bank Berhad, Public Bank Berhad, Bumiputra-Commerce Bank Berhad, Multi-Purpose Bank Berhad, Hong Leong Bank Berhad, Perwira Affin Bank Berhad, Arab-Malaysian Bank Berhad, Southern Bank Berhad and EON Bank Berhad. Each bank had a minimum shareholders' funds of RM2 billion and minimum total assets of RM25 billion (Ahmad, 2012; Sufian, 2004; Bank Negara Malaysia, 1999).
[4] http://www.cimb.com/index.php?ch=g2_au&pg=g2_au_content&ac=14&tpt=cimb_group
[5] https://www.hlb.com.my/news/2011/n170611.jsp?flag=062011
[6] Sources: http://www.bnm.gov.my/index.php?ch=fs_mfs&pg=fs_mfs_list&lang=en

From 2007 onwards, financial liberalization under the General Agreement on Trade in Services of the World Trade Organization (WTO) has seen the WTO gradually inviting foreign banks to penetrate the local financial industry. Since the Malaysian banking industry was opened to foreign competition, the number of foreign financial institutions has increased, from 13 in 2002, to 30 in 2014 (see Table 1.1 for details as at May 2014).

According to Bank Negara Malaysia (2001), the Malaysian government no longer protected local institutions against competition from foreign counterparts as it had done previously. Banks were now free to compete against one another because of the 'open enterprise' policy (Munusamy, Chelliah, & Mun, 2010). The 2008/2009 financial crisis has highlighted the risks associated with foreign banks' presence in the local market. Claessens and van Horen (2012) conclude that the foreign subsidiaries of multinational banks from relatively developed countries may benefit from the underdevelopment of the host country's financial system, ( i.e., a developing country). This conclusion is supported by several studies that reveal foreign banks outperform domestic banks in certain developing countries (Berger, Hasan, & Zhou, 2009; Micco, Panizza, & Yanez, 2007; Grigorian & Manole 2006; Chantapong, 2005; Claessens, Demirguc-Kunt, & Huizinga, 2001) including Malaysia (Detragiache & Gupta, 2006). As predicted, allowing foreign banks to enter the Malaysian market has meant that the challenges faced by local banks has become more rigorous (Ahmad, 2013). In fact, foreign banks are well known as a major threat to their local counterparts in Malaysia (Sufian, Muhamad, Bany-Ariffin, Yahya, & Kamarudin, 2012).

One motivation for this current study is the fact that local banks have been faced with the need to compete head-on, not only among themselves and among their foreign banking counterparts, (Sufian et al., 2012) but also with non-financial institutions. Nowadays, consumers can purchase nearly identical and homogeneous financial products and services from non-financial institutions that previously were offered only by commercial banks (Baumann, Elliott, & Burton, 2012). For instance, deposit facilities are now available at other non-financial institutions resulting from financial liberalization and deregulation (Haron & Wan Azmi, 2008). Financial liberalization and deregulation offers numerous options to customers when choosing banking service providers. The situation indicates that retail banking is mainly at risk from customer switching behaviour (Clemes, Gan, & Zhang, 2010; Chakravarty, Feinberg, & Rhee, 2004; Beckett, Hewer, & Howcroft, 2000). Wei and Nair (2006) confirm that the homogeneity of the products and the intense competition prods Malaysian bank customers to switch product or service providers easily when they are

dissatisfied. In addition, Malaysian customers have become wiser when choosing the right products to satisfy their needs (Chua, 2002).

Given the present situation in the banking industry, the bank that has the largest customer base and the highest customer retention rate will be the market leader (Wei & Nair, 2006). An example of customer retention in retail banks is "customers continuing to maintain an account relationship with the bank" (Keiningham, Cooil, Aksoy, Andreassen, & Weiner, 2007, p. 364) but the study does not mention for how long.

Researchers advocate that customer retention is economically more advantageous than constantly seeking new customers (Verhoef, 2003; Reichheld & Sasser, 1990) and losing a customer is a big 'no' to a bank. The cost of getting a new customer in banking can be five to six times the cost of retaining an existing one (Ndubisi, 2003). Thus, losing a customer is always linked to a decrease in revenue because of the higher costs of attracting new customers and the loss of free advertising through positive word-of-mouth comments (Colgate & Norris, 2001). Several studies recognise the significance of customer loss relating to the decreased profitability of an industry (Fathollahzadeh et al., 2011; Chi & Gursoy, 2009; Sweeney & Swait, 2008).

Conversely, an increase in customer retention rates generally results in increased profitability for organizations, especially for services such as banking, telecommunications, hotels and airlines (Reichheld & Sasser, 1990). In banking, for example, an increase in the customer retention rate of five percent may lead to an 85% increase in the bank's profits (Veloutsou, Daskou, & Daskou, 2004). Studies showing the financial implications of customer retention reveal that there is a strong relationship between customer loyalty and profitability in retail banking (Roig et al., 2013; Bloemer & Odekerken-Schroder, 2002; Trubik & Smith, 2000; Rust & Zahorik, 1993). When customers are loyal to a company, they tend to consume more of a bank's products, provide word-of-mouth advertising for the bank and, ultimately, may not look for an alternative service provider (O'Cass & Grace, 2004).

Specifically, increasing loyalty at a retail bank can: "(1) reduce its servicing costs (i.e., accounts do not have to be opened or closed, and credit ratings do not have to be established); (2) allow the bank to gain knowledge of the financial affairs and needs of its customers (thereby allowing effective and efficient targeting); and (3) allow cross selling of existing and new products and services" (Levesque & McDougall, 1996, p.12). In turn, these factors may result in an increase in profit (Verhoef, 2003; Rust, Zeithaml, & Lemon, 2000; Rust & Zahorik, 1993; Reichheld & Sasser, 1990). Other scholars indicate that increased retention rates can have a positive effect on market share (McGahan & Ghemawat, 1994;

Rust & Zahorik, 1993; Fornell & Wernerfelt, 1988). Service providers, especially in banking, have long realized the value of keeping loyal customers (Narteh, 2013a,b). Because of the strong influence of customer loyalty on bank profitability and market share, effort and resources should be aimed at customer retention (Narteh, 2013b; Roig et al., 2006; Wei & Nair, 2006).

Zeithaml, Berry, and Parasuraman (1996) claimed that positive behavioural intentions can act as an indicator of customer retention. This view is consistent with other researchers who also recognize the importance of customers' behavioural intentions in predicting customer retention (e.g., Luarn & Lin, 2005; Godin, Gagne, & Sheeran, 2004; Patterson, 2004; Norman & Smith, 1995). Examples of positive behavioural intentions are the intent to stay, repurchase intentions, positive word-of-mouth advertising about the organization, increased customer tolerance for service failures and a reduction in customer complaints (Zeithaml et al., 1996; Taylor & Baker, 1994; Cronin & Taylor, 1992). Simultaneously, behavioural intentions can also predict loyalty (Hu, Kandampully, & Juwaheer, 2009; Alexandris, Dimitriadis, & Markata, 2002). In banking, according to Arbore and Busacca (2009), these behavioural intentions have a positive impact on key corporate outcomes, such as retention rates, average deposit amounts, costs to the bank in providing services, and future earnings.

Because of the advantages associated with behavioural intentions, some researchers have emphasized the significance of understanding the constructs that influence customers' behavioural intentions and the interrelationships between these constructs (Narteh, 2013b; Baumann et al., 2012; Hu et al., 2009; Chen, 2008). In addition, studies on behavioural intentions seem crucial for the banking industry given that, today, some consumers no longer bank with one bank and the trend to "multi-banking" is increasing (Lam & Burton, 2005). Therefore, bankers need to better understand the drivers of customer loyalty as well as being able to predict customers' future intentions (Baumann et al., 2012).

This current study surveys Malaysian retail bank customers to investigate the drivers of behavioural intentions. The focus is on the individual customer (retail customer) who always visits the bank branch to execute their banking transactions using either an automated teller machine or over the counter (i.e. interacts with the employees in the branch). Further, this study examines the theoretical and empirical evidence on the interrelationships among the higher order constructs based on Clemes' (2014; 2011b; 2009; 2007) hierarchical models.

## 1.3 Research Gaps

The first conceptual research gap concerns the measurement of customers' perceptions of service quality in the banking industry. In assessing bank service quality, many studies have either replicated or adopted the five-dimensional SERVQUAL model (Ladhari, Souiden, & Ladhari, 2011a; Nadiri et al., 2009; Baumann, Burton, Elliott, & M. Kehr, 2007; Yavas & Benkenstein, 2007; Arasli et al., 2005a,b; Yavas et al., 2004; Cui, Barbara, & Won, 2003; Jabnoun & Al-Tamimi, 2003). Similarly, most empirical studies conducted on the Malaysian banking industry have employed the SERVQUAL scale (Taap et al., 2011; Kumar et al., 2010; Amin & Isa, 2008; Tahir & Abu Bakar, 2007). Regardless of the popularity of SERVQUAL, several drawbacks on the instruments theoretical and operational grounds have been highlighted by researchers. The drawbacks include the use of difference (gap) scores, dimensionality, and the applicability of and lack of validity of the model, especially with respect to the dependence or independence of the five main variables (see Fullerton, 2005; Gilmore, 2003; Babakus & Boller, 1992; Cronin & Taylor, 1992; Carman, 1990).

Criticism of SERVQUAL model has led other scholars to develop alternatives; one is the hierarchical service quality model proposed by Brady and Cronin (2001). This model is based on the argument that customers develop their service quality perceptions on the basis of an evaluation of performance at the primary and subdimension levels and ultimately, merge these evaluations to reach an overall service quality perception (Brady & Cronin, 2001; Dabholkar et al., 1996; Carman, 1990). According to this model, service quality is not only perceived as multidimensional but is also perceived in a hierarchical/multilevel form (Clemes, Shu, & Gan, 2014; Clemes, Bush, & Collins, 2011a; Lu, Zhang, & Wang, 2009; Martínez Caro & Martínez García, 2007; Fassnacht & Koese, 2006; Gounaris, 2005; Brady & Cronin, 2001; Dabholkar et al., 1996). The empirical results of Lu et al. (2009) further confirm that consumers assess service quality using several levels to reach their overall service quality evaluation.

Other empirical studies support Brady and Cronin's hierarchical service quality model and it has been tested in several industries, e.g., mobile health (Akter, D'Ambra, & Ray, 2013), airlines (Wu & Cheng, 2013), mobile communications (Clemes et al., 2014; Lu et al., 2009), motels (Clemes, Gan, & Ren, 2011b), sport (Clemes et al., 2011a), higher education (Clemes, Cohen, & Wang, 2013, Clemes, Gan, & Kao, 2007), health care (Chahal & Kumari, 2010; Dagger, Sweeney, & Johnson, 2007), retailing (Dabholkar et al., 1996), hairdressing

and local phone services (Pollack, 2009), travel agencies (Martínez Caro & Martínez García, 2008), transport services (Martínez Caro & Martínez García, 2007), recreational sport (Ko & Pastore, 2005) and, recently, in retail banking (Hossain, Dwivedi, & Naseem, 2014). Hossain et al. (2014) study has developed and tested the model based on Bangladeshi and Australian banking customers' perspectives.

However, to date, no empirical studies have identified the primary and subdimensions of retail bank service quality based on a Malaysian perspective. This is important because the primary and subdimensions of service quality greatly depend on the type of industry (Strandberg et al., 2012; Brown, Churchill, & Peter, 1993; Babakus & Boller, 1992; Carman, 1990) and cultural background (Clemes, et al., 2010; Cui et al., 2003). Consumers of services in different countries may make different assessments of what service quality is because of environmental and cultural dissimilarities (Malhotra, Ulgado, Agarwal, Shainesh, & Wu, 2005). In fact, several studies have emphasized the significant influence of cultural factors on perceived service quality (Malhotra et al., 2005; Stauss & Mang, 1999; Donthu & Yoo, 1998; Winsted, 1997). For example, according to Matilla (1999), Western cultural background customers are more likely to depend on tangible cues from the physical environment to evaluate service quality than their Asian counterparts. Therefore, testing a comprehensive hierarchical model in a Malaysian banking context is necessary for further validation.

The second research gap is the lack of published research pertaining to the service quality dimensions that retail bank customers perceive to be more or less important during their banking experience. Closing this gap is crucial because bankers may then be more certain that they are evaluating the appropriate aspects of banking services as perceived by customers.

The third research gap identified in the literature review is the lack of published research testing the interrelationships between service quality, customer satisfaction, perceived value, corporate image, switching costs and behavioural intentions in the banking industry. All these service marketing constructs have been identified as having a relationship with behavioural intentions in various service industries, as well as being key success factors in gaining a competitive advantage among service providers (Clemes et al., 2014; Clemes et al., 2011b; Hu et al., 2009). The important interrelationships among these constructs was further acknowledged by Korda and Snoj (2010), Rod, Ashill, Shao, and Carruthers (2009), Bontis, Booker, and Serenko (2007), and Arasli et al. (2005a).

In the banking industry, the relationships between these constructs and behavioural intentions have also been empirically identified (Amin et al., 2013; de Matos, Henrique & de

Rosa, 2009; Ehigie, 2006; Lewis & Soreli, 2006; Beerli et al., 2004; Almossawi, 2001; Nguyen & LeBlanc, 1998). However, no empirical study to date on banking has investigated all these six important marketing constructs in a single framework or tested the relationships simultaneously. The assessments of many studies on banking have been fragmented when evaluating the exact nature of the relationships (Bontis et al., 2007; Lewis & Soureli, 2006; Yang & Peterson, 2004). Thus, the complex interrelationships among these constructs have not been fully discovered and understood for banking (Lewis & Soureli, 2006; Caruana, 2002) especially from a Malaysian perspective (Ndubisi, Malhotra, & Wah, 2009). Several service marketing academics have urged future researchers to develop a richer model of behavioural intentions (Narteh, 2013b; Lewis & Soureli, 2006; Ehigie, 2006; Beerli et al., 2004; Caruana, 2002; Nguyen & LeBlanc, 1998) so that the understanding of the interrelationships and the effects on customer behavioural intentions can be improved (Hu et al., 2009).

Additionally, Lewis and Soureli (2006) claim that each loyalty driver cannot be examined in isolation from the interrelationships between the other constructs because loyalty behaviour appears to be the outcome of all the interrelationships. Hence, this current study represents the first analysis of the interrelationships between all six marketing constructs i.e., service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions, in a single theoretical framework in a Malaysian retail banking context. The findings are therefore more robust than the findings from other studies where only a single relationship was examined: service quality and customer satisfaction (Choudhury, 2013; Al-Hawari, Ward, & Newby, 2009; Caruana, 2002; Baker & Crompton, 2000), or three relationships: service quality, customer satisfaction, and corporate image (Ladhari, Souiden, & Ladhari, 2011b; Bloemer et al., 1998), service quality, perceived value, and customer satisfaction (Suhartanto, 2011; Brady, Knight, Cronin, Tomas, Hult, & Keillor, 2005; Cronin, Brady, & Hult, 2000). Moreover, no other study has measured customers' perceptions of service quality based on a second order conceptualisation of service quality and linked the construct with the other five marketing constructs in the same measurement instrument.

The fourth research gap identified in the literature review is the lack of published studies on the relationship between perceived value and behavioural intentions in banking. Despite the importance of perceived value as a main attribute of customers' evaluation of services, limited and insufficient work has been undertaken in banking on understanding the

precise nature of the construct and its impact on behavioural intentions (Lewis & Soureli, 2006; Caruana, 2002; Nguyen & LeBlanc, 1998). Lewis and Soureli (2006) used correlation analysis in their study and their results confirm that perceived value is an antecedent of loyalty in banking. However, the researchers suggest the need for further study using structural equation modelling (SEM) since it can provide an assessment of causal relationships. This is due to the limitations of correlation analysis, which provides evidence only of the existence and strength of the relationships. Therefore, SEM is used in this current study to examine the antecedent of perceived value and the consequences.

The fifth conceptual research gap is the lack of published empirical research on retail bank customers' behavioural intentions in developing countries. Several studies on behavioural intentions have to date, focused on the Western perspective and not on the perspective of a developing country such as Malaysia (Ndubisi et al., 2009; Guriting & Ndubisi, 2006; Durvasula, Lysonski, Mehta, & Tang, 2004). Research on developing countries is crucial because developing countries will offer different results when measured across cultures, because their unique cultural characteristics may result in different relationship patterns and different strengths in the relationships (Zhang, van Doorn, & Leeflang, 2014; Clemes et al., 2010; Lai, Griffin, & Babin, 2009; Dabholkar, 1995).

Researchers are also being encouraged to build industry-specific models, particularly to measure service quality (Martínez Caro & Martínez García, 2008; Dabholkar et al., 1996). According to Clemes et al. (2011a) and Babakus and Boller (1992) service quality is a simple uni-dimensional construct in some industries, but a complex multidimensional construct in others. For these reasons, researchers have proposed that industry or context-specific measures of service quality may be more appropriate than a single generic scale (Clemes et al., 2014; Clemes et al., 2011a, 2011b; Martinez García & Martinez Caro, 2010; Martínez Caro & Martínez García, 2008; 2007; Clemes et al., 2007; Dyke, Leon, & Prybutok, 1997; Carman, 1990). Martínez Caro and Martínez García (2008) claim that most researchers have been just replicating a universal concept of a service quality model and this is not appropriate since key factors of service quality are different across all service industries.

## 1.4 Research Objectives

The primary aim of this research is to empirically test a comprehensive hierarchical model of behavioural intentions in the Malaysian retail banking industry. This study simultaneously investigates in a single framework, the interrelationships that exist between service quality, customer satisfaction, perceived value, corporate image, switching costs and

behavioural intentions. This study also uses a multidimensional and hierarchical modelling approach to measure service quality (Brady & Cronin, 2001; Dabholkar et al., 1996) to determine the dimensions of bank service quality as perceived by bank customers. The intent of this study is to expand the research on service quality and behavioural intentions in a developing country and test an industry-specific model. Thus, the specific objectives of this study are to identify:

i. the service quality dimensions as perceived by Malaysian retail bank customers;
ii. the least and most important service quality dimensions as perceived by Malaysian retail bank customers; and
iii. the interrelationships that exist between service quality, customer satisfaction, perceived value, corporate image, switching costs and behavioural intentions.

### 1.5 Contributions of this Research

By satisfying the three research objectives, this study will make a contribution to the service marketing literature from both a theoretical and practical perspective, especially in retail banking.

This study is the first to develop an integrated theoretical framework for the retail banking industry using a hierarchical model to assess bank service quality. The model is extended to simultaneously investigate the complex interrelationships between service quality, customer satisfaction, perceived value, corporate image, switching costs and behavioural intentions. A thorough review of the marketing literature reveals that only a few studies have developed and tested a comprehensive hierarchical model integrating the higher order constructs (e.g., Clemes et al., 2014, 2013, 2011a, 2011b; Pollack, 2009; Clemes et al., 2007; Dagger et al., 2007). Moreover, there are no studies of the Malaysian banking sector that test all six important marketing constructs simultaneously, in a single framework, to assess the antecedents of behavioural intentions.

The results of this current research will extend the current service marketing literature and theory on bank customers' behavioural intentions as well as the empirical evidence on the theoretical relationships between all the constructs. By testing a comprehensive model of behavioural intentions, this study will improve the understanding of the interrelationships among these service marketing constructs and their impact on customers' behavioural intentions, especially in the Malaysian retail banking market. Thus, it will provide bank

managers with useful information about ways to increase their customer retention rates, and it will assist bank managers in forming and executing effective service marketing strategies.

This study will also contribute to the service marketing literature by offering empirical support for the use of the multidimensional and hierarchical modelling approach for conceptualising and assessing service quality in the Malaysian banking industry, as perceived by retail customers. The findings will provide Malaysian bankers with empirically-based insights and holistic ideas for evaluating and enhancing service quality in order to induce greater customer satisfaction, greater perceived value, improved corporate image, increased switching costs and consequently, the creation of positive behavioural intentions.

In summary, the results of this research will provide guidelines to banks for developing appropriate strategies and quicker reaction times to changes in customers' banking behaviour. This study will also contribute to the literature by focusing on the retail banking sector of a developing economy. A thorough review of the consumer services marketing literature shows that the bulk of the existing research regarding the relationships among the six constructs is based on samples derived from developed Western countries.

## 1.6 Structure of the Thesis

Chapter 1 introduces the issues relating to the subject under investigation, with a brief discussion about the problems and research gaps, as well as the objectives of this study. The final section describes the contribution of this study.

Chapter 2 discusses an extensive literature review relevant to the subject being studied. The chapter reviews the relevant literature associated with the constructs that form the proposed behavioural intentions model. These constructs include the service quality dimensions; i.e. service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions.

Chapter 3 discusses the theoretical framework development together with the 18 hypotheses to be tested. The proposed conceptual and theoretical framework is also presented in the chapter.

Chapter 4 presents and justifies the methodology used in this study: the research design, construct operationalization, the sampling technique, administration of the survey, pre testing and the final survey used. The data analysis methods, the appropriate statistical techniques adopted, as well as the reliability and validity of the constructs are also presented in this chapter.

Chapter 5 reports the results using the techniques discussed in Chapter 4. This includes the results relating to the sample profile, and the results relating to the testing of the underlying hypotheses using exploratory factor analysis (EFA) and the two-stage approach of structural equation modelling (SEM) via SPSS and AMOS version 18. It is essential for the first stage of SEM to have valid, reliable constructs, in order to test the 18 hypotheses presented in Chapter 3 that are about the interrelationships among the constructs. The findings of this study are then reported.

Finally, Chapter 6 discusses and interprets the results drawn from testing the 18 hypotheses, aiming to satisfy the three research objectives outlined in Chapter 1. The theoretical and managerial implications are further discussed together with the limitations of this study and avenues for future research.

# Chapter 2
# Literature Review

This chapter reviews the literature related to the conceptualisation, measurement and theoretical background of behavioural intentions, service quality, customer satisfaction, perceived value, corporate image and switching costs. In addition, this chapter includes a discussion of the interrelationships involved among the six marketing constructs.

## 2.1 Behavioural Intentions

The behavioural intentions model utilized in this study is based on learning theory and assumes that behaviour towards a specific object can be approximated by an intention to perform that behaviour (Cronin et al., 2000; Fishbein & Ajzen, 1975). Behavioural intentions, often measured as "conative loyalty", are important in the consumer marketing community (Johnson, Herrmann, & Huber, 2006) because they are key factors in a company's long-term sustainability (Chen & Chen, 2010). Most researchers employ behavioural intentions, i.e., conative loyalty, as a compromise for action loyalty, because in practice, action loyalty is hard to measure (Yang & Peterson, 2004).

Zeithaml et al. (1996) define behavioural intentions as indicators that signal whether customers will remain with, or defect from, a company. The first comprehensive, multidimensional framework of customer behavioural intentions in services was proposed by Zeithaml et al. (1996). It comprises four main dimensions: (1) word-of-mouth (WOM) communications; (2) purchase intentions (loyalty); (3) price sensitivity; and (4) complaining behaviour. The authors also note that both positive and negative behavioural intentions can occur. Positive or favourable behavioural intentions are closely related to a service provider's ability to get its customers to say positive things about it, recommend it to other consumers, repurchase from it, spend more with it, and pay price premiums (Zeithaml et al., 1996; Zeithaml, 1988). Others claim that the behavioural perspective refers to the concept of repeat patronage or intention to rebuy (Baumann et al., 2007; Durvasula et al., 2004; Oliver, 1997). Reichheld (2003) specifically measured two types of behavioural intentions; the repurchase intention and the recommendation intention. Reichheld (2003) suggests that "willingness to recommend" is the most important item for companies to measure, since his results show that it is associated more strongly than any other, with a company's growth. In most studies, the items 'intention to repurchase' (or revisit) and 'willingness to recommend to others', have

been heavily used as indicators of behavioural intentions (Chen & Tsai, 2007). Alexandris et al., (2002) conclude that generally, behavioural intentions are related to customer retention and loyalty behaviour. Additionally, Ajzen and Fishbein (1980) suggest that behavioural intentions could to a large degree, predict actual behaviour.

In this current study, behavioural intentions have been measured as a customer's intention to remain with his/her main bank over the long term. Therefore, 'repurchase and recommendation', 'WOM communication' and 'intention to purchase' were used as indicators to measure the construct (Chen & Tsai, 2007; Reichheld, 2003; Zeithaml et al., 1996). This approach is consistent with other studies related to behavioural intentions (i.e., Biscaia, Correia, Rosado, Maroco, & Ross, 2012; Ryu, Lee, & Kim, 2012; Lai & Chen, 2011; Gounaris, et al., 2010; Chen, 2008; Dagger et al., 2007; Alexandris et al., 2002; Boulding, Kalra, Staelin, & Zeithaml, 1993; Cronin & Taylor, 1992). However, following on from Baumann et al. (2012), 'repurchase intentions' which is usually used to measure loyalty to physical products, was replaced by 'intentions to remain a customer'. This replacement is more appropriate in retail banking because according to Garland and Gendall (2004, p. 91), banking is a "subscription-type" business.

### 2.2 Constructs Related to Behavioural Intentions

Studies on the constructs related to customers' behavioural intentions are highly beneficial to service providers' profits because customer loyalty is the key driver of long-term financial performance (Arbore & Busacca, 2009; Ehigie, 2006). A review of the service marketing literature shows that behavioural intentions are associated with: (1) satisfaction in various industries such as mobile telecommunications (Clemes et al., 2014), Islamic banking (Amin et al., 2013), upscale Chinese restaurants (Ryu et al., 2012), the motel industry (Clemes et al., 2011b), higher education (Clemes et al., 2007), spectator sports (Biscaia et al., 2012; Cronin et al., 2000), heritage tourism (Chen & Chen, 2010), hairdressing and local phone services (Pollack, 2009), health care (Dagger et al., 2007; Cronin et al., 2000), banking, pest control, dry cleaning, and fast food (Cronin & Taylor, 1992), and cruise passengers (Petrick, 2004); (2) service quality in agri-food (Mason & Nassivera, 2013), e-shopping (Gounaris et al., 2010), tourism (Chen & Tsai, 2007; González, Comesaña, & Brea, 2007; Baker & Crompton, 2000), service factories (Olorunniwo, Hsu, & Udo, 2006), and hotels (Alexandris et al., 2002; Boulding et al., 1993); (3) perceived value in heritage tourism (Chen & Chen, 2010), the hotel industry (Hu et al., 2009), the airline industry (Chen, 2008), spectator sports, participation sports, health care, fast food, entertainment, and long

distance carriers (Cronin et al., 2000); (4) switching costs in banking (de Matos, Henrique, & de Rosa, 2013; Baumann et al., 2012; de Matos et al., 2009; Beerli et al., 2004), any service provider or retailer (Jones, Reynolds, Mothersbaugh, & Beatty, 2007), E-tailing (Wang, Wu, Lin, & Wang, 2011); and (5) corporate image in tourism (Andreassen & Lindestad, 1998), banking (Ladhari et al., 2011b; Lewis & Soureli, 2006; Bloemer et al., 1998; Nguyen & LeBlanc, 1998), mobile communications (Clemes et al., 2014; Lai et al., 2009; Aydin, Özer, & Arasil, 2005), and upmarket department stores (Hart & Rosenberger, 2004).

### 2.2.1 Satisfaction

In a competitive market place, customer satisfaction is a key driver and differentiator of the long-term relationships between customers and providers (Munusamy et al., 2010; Geyskens, Steenkamp, & Kumar, 1999; Zeithaml et al., 1996). Customer satisfaction is also identified as a proxy for a company's success, based on the assumption that satisfaction is closely linked to customer loyalty and retention (Patterson, 2004). Many studies reveal that customer satisfaction contributes to a company's profitability (Bolton, 1998; Fornell, Johnson, Anderson, Cha, & Bryant, 1996; Anderson, Fornell, & Lehmann, 1994; Fornell, 1992; Reichheld & Sasser, 1990). This is because more satisfied customers often result in greater loyalty (Hallowell, 1996; Anderson & Sulivan, 1993; Boulding et al., 1993; Reichheld 1993) who in turn, often "spread the good news" and recommend the services to others (Zeithaml et al., 1996; Reichheld & Sasser, 1990), which, eventually leads to higher sales and subsequently higher financial earnings for the company (Chi & Gursoy, 2009).

Therefore, achieving customer satisfaction is vital for all service providers. In banking, customer satisfaction functions as a link to important consumer behaviours, for example, cross buying of financial services, positive word-of-mouth, willingness to pay a premium-price and a tendency to see one's bank as a "relationship" bank (Ehigie, 2006; Ndubisi, 2006). This is why an increasing number of retail banks direct their marketing strategies towards customer satisfaction (Arbore & Busacca, 2009).

Customer satisfaction is generally described as a feeling or judgement made by customers towards products or services after they have consumed or experienced them (Jamal & Naser, 2003). Customer satisfaction has also been considered as a customer's post-purchase assessment and effective response to the overall product or service experience (Patterson & Spreng, 1997) or an emotional state that arises in response to the assessment of a service (Westbrook, 1981). Additionally, Hoyer and MacInnis (2001) note that satisfaction can be associated with feelings of acceptance, happiness, relief, excitement and delight.

However, according to de Matos et al., (2009), the most recent approach in defining customer satisfaction uses the terms transaction-specific and cumulative satisfaction (Yi & La, 2004; Olsen & Johnson, 2003; Jones & Suh, 2000; Oliver, 1997; Boulding et al., 1993). Transaction-specific refers to consumers' emotional answers to their most recent transaction experience or service encounter (Bitner & Hubbert, 1994; Oliver, 1993); it may provide specific diagnostic information about a particular product or service encounter. In contrast, cumulative satisfaction is a customer's overall evaluation based on the total consumption experience with service over time and thus, is influenced by factors across service encounters (Zhao, Lu, Zhang, & Chau, 2012; Johnson, Anderson, & Fornell, 1995).

Since the 1990s, many researchers have viewed satisfaction as customers' cumulative, after purchase, and overall judgment about purchasing behaviour (Gupta & Zeithaml, 2006; Oliver, 1997; Johnson, Anderson, & Fornell, 1995). Satisfaction reflects the accumulated impressions of customers concerning the service performance of a company. Customers need to experience the product or service to ascertain their level of satisfaction as satisfaction is based on current and past experiences (Anderson et al., 1994). Researchers have found that cumulative or overall satisfaction is a better indicator of the firm's past, current and future performance as well as being the best predictor of loyalty (Yang & Peterson, 2004; Anderson et al., 1994).

In fact, overall satisfaction can be considered as an accumulation of all previous transaction-specific satisfactions (Zhao et al., 2012; Jones & Suh, 2000). Customers make repurchase evaluations and decisions not only based on a particular transaction or episode but also on their overall purchase and consumption experiences (Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2001). In this study, satisfaction refers to the overall experiences of customers while receiving service from their bank over time, to which the cumulative satisfaction concept applies. This is consistent with most previous customer satisfaction studies (Eusébio & Vieira, 2013; Biscaia et al., 2012; Ladhari et al., 2011b; Lai & Chen, 2011; Chen, 2008; Gupta & Zeithaml, 2006).

### 2.2.2 The Relationship between Satisfaction and Behavioral Intentions

Fornell (1992) claims that high customer satisfaction results in increased loyalty to the company and that those customers will be less prone to switching. A satisfied customer is more likely to form future purchase intentions and engage in positive word-of-mouth advertising (Jamal & Naser, 2002; Zeithaml et al., 1996). In banking, satisfied customers are prone to engage in long-term relationships with their bank and spread positive word-of-mouth

advertising to others. Conversely, when they are dissatisfied, they will react negatively and switch to other service providers (Amin et al., 2013; Kaur, Sharma, & Mahajan, 2012; Amin, Isa, & Fontaine, 2011).

Empirically, many studies support the linkages between satisfaction and behavioural intentions, such as repurchase and word-of-mouth communication in multiple industries such as the hotel industry (Suhartanto, Clemes, & Dean, 2013; Oh, 1999), sports spectators (Biscaia et al., 2012; Cronin et al., 2000), authentic upscale Chinese restaurants (Ryu et al., 2012), hospital services (Choi & Kim, 2013), heritage tourism (Chen & Chen, 2010), hairdressing and local phone services (Pollack, 2009), internet services (Bai, Law, & Wen, 2008), higher education (Clemes et al., 2007), health care (Dagger et al., 2007; Cronin et al., 2000), mobile communications (Clemes et al., 2014; Aydin & Ozer, 2005), fast food (Brady & Robertson, 2001; Cronin et al., 2000), computer manufacturers, retail chains, automobile insurers, life insurers (Zeithaml et al., 1996), and banking (Amin et al., 2013; Narteh, 2013b; Pe´rez, Salmones, & Bosque, 2013; Baumann et al., 2012; Amin et al., 2011; Ladhari et al., 2011b; Baumann et al., 2007; Beerli et al., 2004; Athanassopoulos, Gounaris, & Stathakopoulos, 2001; Bloemer et al., 1998; Nguyen & LeBlanc, 1998; Rust & Zahorik, 1993; Cronin & Taylor, 1992).

For instance, Cronin and Taylor (1992) found a significant positive relationship between satisfaction and repurchase intentions. They reported considerable differences with regard to the relationship between satisfaction and repurchase intentions among four service industries: banking, pest control, dry cleaning and fast food. Rust and Zahorik (1993) conclude that in banking, customer satisfaction is related to individual loyalty, aggregate retention rate, market share and profits. Research by Pollack (2009), Clemes et al. (2014, 2007) and Dagger et al. (2007) has empirically confirmed a positive relationship between satisfaction and favourable future behavioural intentions (word-of-mouth advertising and purchase intentions) in several industries: hairdressing and local phone services, mobile communications, education, and health care. Recently, Amin et al. (2013) revealed that customer satisfaction is positively related to customer loyalty (i.e., return intentions and positive word-of-mouth endorsement) in the Malaysian Islamic banking industry.

### 2.2.3 Service Quality

Unlike product quality, service quality has the benefit of being hard to imitate, which suggests that superb service quality has the ability to win customers. Prior studies suggest that superior service quality results in a number of desirable outcomes such as; fewer

customer defections, enhanced customer retention rates, the attraction of new customers through word-of-mouth recommendations, repeat patronage; chances for cross-selling, improved corporate image, perceived value, customer satisfaction, increased profits, and enhanced market share (Ladhari, et al., 2011a; Baumann et al., 2007; Lobo, Maritz, & Mehta, 2007; Ehigie, 2006; Arasli et al., 2005b; Duncan & Elliott, 2004; Wang, Lo, & Hui, 2003; Cronin et al., 2000; Angur et al., 1999; Nguyen & Leblanc, 1998; Rust & Zahorik, 1993; Reichheld & Sasser, 1990).

In banking, service quality is considered of utmost importance and is a primary competitive weapon for survival since the banks compete in the market place with generally undifferentiated products (Choudhury, 2013; Karatepe, 2011; Hossain & Leo, 2009; Haron & Wan Azmi, 2008). Thus, banks that excel in offering superior service quality have a distinct marketing edge in terms of higher returns, increased cross-sell ratios and possibly higher customer retention rates (Bennett & Higgins, 1988) and expanded market share (Bowen & Hedges, 1993). More importantly, long term survival of bank branches mostly depends on the service quality levels they provide (Portela & Thanassolis, 2005).

Therefore, banks should focus on service quality as a core competitive strategy (Hossain & Leo, 2009; Chaoprasert & Elsey, 2004; Wang et al., 2003) and imperatively work on this area. Parasuraman, Zeithaml, and Berry (1988) define service quality as a global judgment or attitude relating to the overall superiority of the service. This definition is generally accepted but the exact nature of this attitude is not clear (Robinson, 1999). Some advocate that it arises from a comparison of expectations with performance perceptions (disconfirmation) (Parasuraman et al., 1988), whereas others contend that it is derived from a comparison of performance with ideal standards (Teas, 1993), or from perceptions about performance alone (Cronin & Taylor, 1992). The conceptualisation of service quality is further discussed in the following subsection.

### 2.2.4 Conceptualisation of Service Quality

Though researchers generally agree that service quality is a multidimensional construct (Prentice, 2013), considerable debate exists regarding the overall number and type of dimensions (Pollack, 2009). From a theoretical perspective, two dominant schools of thought existed before a reconciliation attempt was made by Brady and Cronin (2001). The first was the “Nordic” perspective, originating in Scandinavia/Northern Europe (Grőnroos, 1984), which defines the dimensions of service quality in global terms as consisting of its functional and technical qualities. Referring to the “Nordic” perspective, service quality was based on

the expectancy disconfirmation theory (disconfirmation paradigm) where quality is a result of the difference between perceived and expected service (Ting, 2004). Grőnroos' conceptualization of service quality was the first to be discussed in academic literature.

Secondly, there was the "American" perspective (Parasuraman, Zeithaml, & Berry, 1985) which also conceptualised service quality as a function of the differences between expectation and performance (disconfirmation paradigm), known as the GAPS model. Later, in 1988, based on this conceptualisation, the research was refined and a service quality measurement scale called 'SERVQUAL' was proposed (see Section 2.2.5.2 for further discussion of the SERVQUAL scale). Although several alternative conceptualizations of service quality have been proposed to date, researchers in general have adopted one of the two conceptualizations discussed above. Chahal and Kumari (2010) mention that the "American" perspective dominates the services marketing literature (Yavas & Benkenstein, 2007; Arasli et al., 2005a; Newman, 2001; Angur et al., 1999).

### 2.2.5 Service Quality Models

The conceptualisation of models in service quality is important because it allows management to identify service quality problems and thus help in the performing of service quality improvement programmes, thereby improving a company's efficiency, profitability and overall performance (Seth & Deshmukh, 2005). Accordingly, various models have been developed and refined to measure perceptions of service quality (Brady & Cronin, 2001; Dabholkar et al., 1996; Cronin & Taylor, 1992; Parasuraman et al., 1988, 1985; Grőnroos, 1984). The conceptualisation of models also contributes to the development of theory, for example, the theoretical background of service quality is moving from expectancy disconfirmation (gap theory model) to the perceptions only model, by discarding the expectations of the SERVQUAL (Cronin & Taylor, 1992). Subsequently, evidence suggests that service quality should be based on performance measures alone (Zeithaml et al., 1996; Cronin & Taylor, 1994; Teas, 1994; Babakus & Boller, 1992).

#### 2.2.5.1 Perceived Service Quality Model

The first perceived service quality model was developed by Grőnroos (1984) and is referred to as the Nordic model. This model identifies two service quality dimensions and adapts the disconfirmation paradigm to measure service quality. The first quality dimension is the technical aspect, which refers to the *outcome* quality of the process, or "what" service is being provided. The second dimension is the functional aspect, which represents "how" the

service is delivered, i.e., it defines customers' perceptions of the interactions that take place during service delivery. However, the Nordic model does not include the quality of the physical service environment that is associated with the tangibles dimension of SERVQUAL (Pollack, 2009).

#### 2.2.5.2 SERVQUAL Model

The SERVQUAL measurement model was based on the GAP analysis (Parasuraman et al., 1988). Parasuraman et al. maintain that service quality, as perceived by customers, stems from a comparison of customers' expectations and their perceptions of the performance delivered by the service provider. A measurement scale was developed based on data from five service industries: appliance repair and maintenance, retail banking, long-distance telephone services, securities brokerages, and credit card services (Parasuraman et al., 1988, 1985). The expectation of SERVQUAL was to offer an instrument for assessing service quality that would apply across a broad range of services with only minor modifications in the scale needed (Babakus & Mangold, 1992). Parasuraman et al. (1988) claim that although each service industry is distinct in some aspects, generally five dimensions are applicable to service-providing organizations.

The dimensions are: "(1) tangible: physical facilities, equipment, and appearance of personnel; (2) reliability: ability to perform the promised service dependably and accurately; (3) responsiveness: willingness to help customers and provide prompt service; (4) assurance: knowledge and courtesy of employees and their ability to inspire trust and confidence; (5) empathy: caring, the individualized attention the firm provides its customers" (Babakus & Mangold, 1992, p.769). The early version of SERVQUAL contained 22 pairs of items; half of these items were proposed for measuring consumers' expected level of service for a specific industry (*expectations*). The other 11 pairs were intended to measure consumer perceptions of the recent level of service provided by a particular organization (*perceptions*). The higher the *perception* minus *expectation* score (more positive), the higher the perceived level of service quality (Parasuraman et al., 1985; 1988). In 1994, the number of items were reduced to 21 pairs, but the five dimensions were maintained (Seth & Deshmukh, 2005).

#### 2.2.5.3 Problems with SERVQUAL

Despite the extensive use of the SERVQUAL model to measure service quality, several theoretical and empirical criticisms of the scale have been highlighted (Ladhari, 2009a; Asubonteng, McCleary, & Swan, 1996; Cronin & Taylor, 1992; Carman, 1990). For instance, Carman (1990) noted that the stability of the SERVQUAL dimensions are unclear, are not

completely generic, and are not sufficient to meet the needs of service quality measurement. Several researchers argue that the number and composition of the service quality dimensions are dependent on the service setting (Strandberg et al., 2012; Brown et al., 1993; Babakus & Boller, 1992; Carman, 1990) as well as the cultural context (Cui et al., 2003).

Cronin and Taylor (1992) reported that the five dimensional structure of SERVQUAL could not be empirically confirmed in any of their samples and also Buttle (1996), discovered a difficulty in replicating the SERVQUAL scale across diverse service contexts. Further studies confirmed that the SERVQUAL scale failed to support the five-dimensional structure in various service settings such as retail stores (Burns & Neisner, 2006; Dabholkar et al., 1996), hotels (Ladhari, 2009b; Wilkins et al., 2007), hospitality (Juwaheer, 2004; Getty & Getty, 2003), air transport (Saha & Theingi, 2009), restaurants (Arora & Singer, 2006), sports events (Ko, Zhang, Cattani, & Pastore, 2011), insurance (Tsoukatos & Rand, 2006) and also in banking (Vera & Trujillo, 2013; Arasli et al., 2005a).

Other scholars were concerned about the dependence on two scales to measure perceptions and expectations when one scale (performance measure) would be simpler and more easily understood and therefore ultimately, more effective. The use of expectations was questioned by Babakus and Mangold (1992) and Cronin and Taylor (1992). They concluded, based on their study results that measured service quality in banking, that the expectation-perception disconfirmation approach had little support either theoretically or empirically. Carman (1990) noted that the use of two scales and the negatively worded questions were both time consuming and too complex for most respondents.

A further weakness is that SERVQUAL mainly focuses on functional quality (the service delivery process) rather than technical quality (the outcome of the service encounter) (Richard & Allaway, 1993; Mangold & Babakus, 1991; Grőnroos, 1990). Hence, it was argued that using only functional quality attributes to explain and/or predict consumers' behaviour might be a misspecification of service quality that results in a low predictive validity (Richard & Allaway, 1993).

Finally, the fundamental model underlying SERVQUAL has been questioned because the dimensions are not completely generic and largely depend on the type of industry being studied (Cronin & Taylor, 1992). Also, the scale does not seem to be appropriate in every cultural context (Cui et al., 2003). Several researchers contend that service quality is an aggregation of various quality subdimensions and that service quality is, therefore, a multilevel construct as well as a multidimensional construct (Hossain et al., 2014; Clemes et

al., 2014, 2011, 2010, 2007; Pollack, 2009; Dagger et al., 2007; Wilkins et al., 2007; Brady & Cronin, 2001; Dabholkar et al., 1996).

#### 2.2.5.4 SERVPERF Model

In an effort to overcome the flaws of SERVQUAL, other conceptualisations have been proposed as alternative service quality measures (Pollack, 2009). Prominent among these are Cronin and Taylor's (1992) SERVPERF measure, which has the claimed advantage of being one scale designed to measure service quality performance using a seven-point semantic differential scale with answers ranging from very poor to excellent. SERVPERF eliminates the expectations scale and has been empirically tested in dentistry and telecommunications (Newman, 2001).

The term "performance-only measures" refers to service quality measures based only on consumers' perceptions of the performance of a service provider, as opposed to the difference (or gap) between consumers' performance perceptions and their performance expectations. Cronin and Taylor (1992) reported empirical evidence that the performance-only SERVPERF instrument performs better than the disconfirmation-based SERVQUAL scale in four industries (i.e., banking, pest control, dry cleaning, and fast food); other researchers produced similar results (Petrick & Backman, 2002; Asubonteng et al., 1996; Teas, 1993). In summary, the evidence suggests that service quality should be based on performance measures alone (Zeithaml et al., 1996; Cronin & Taylor, 1994; Teas, 1994; Babakus & Boller, 1992) and that more support for the exclusion of expectations in measuring service quality has been reported (Brady & Cronin, 2001; Mentzer, Flint, & Hult, 2001; Dabholkar, Shepherd, & Thorpe, 2000).

#### 2.2.5.5 The Three-Component Model

Rust and Oliver (1994), in proposing the Three-Component Model, suggested that perceptions of service quality stem from three service quality dimensions: (1) the service product or technical quality; (2) the service delivery or functional quality; and (3) the service environment. This model was based on Grőnroos' (1982) perceived service quality model.

#### 2.2.5.6 The Multilevel Model

In addition to the concept of a multidimensional perspective, Dabholkar et al. (1996) proposed that perceptions of service quality are also multilevel. Several researchers have proposed that service quality is a multidimensional and multilevel (hierarchical) construct (Clemes et al., 2014, 2011, 2010, 2007; Martínez Caro & Martínez García, 2008, 2007; Brady & Cronin, 2001; Carman, 1990). The multilevel dimension indicates that service

quality comprises several primary dimensions which in turn, share a common theme represented by the higher order, overall perceived service quality construct. Moreover, multilevel dimensions have subdimensions that combine related attributes into subgroups. Perceptions of overall service quality are therefore, represented as a third order factor to the subdimensions (Brady & Cronin, 2001). According to Martínez Caro and Martínez García (2007), the proposed model improves our understanding of three basic issues: (1) what defines service quality perceptions, (2) how service quality perceptions are formed, and (3) how important it is where the service experience takes place.

#### 2.2.5.7 Hierarchical Retail Service Quality Model

Dabholkar et al. (1996) developed a hierarchical model because of their belief that previous measures of service quality (i.e., SERVQUAL) were inadequate for measuring or evaluating perceptions of service quality in the context of retail stores. As a result, they proposed that retail service quality should have a hierarchical factor structure since customers think of retail service quality at three different levels. The highest level measures customers' overall service quality, the second level consists of five primary dimensions and the third level consists of their subdimensions (appearance, convenience, promises, doing it right, inspiring confidence, courteous and helpful). The five primary dimensions: *physical aspects, reliability, personal interaction, problem solving* and *policy,* are central to service quality and are expected to be distinct but highly correlated (Dabholkar et al., 1996). This multilevel model recognises the many facets and dimensions of service quality perceptions. As a result, Dabholkar et al. (1996) conclude that this instrument could serve as a diagnostic tool that allows retailers to determine the service areas that are weak and in need of attention.

#### 2.2.5.8 Integrated Hierarchical Model

A further extension of the multilevel approach was the integrated hierarchical model introduced by Brady and Cronin (2001). They developed the model by combining it with the traditional approaches to service quality and tested it across four service industries. Those traditional approaches were inspired from SERVQUAL (Parasuraman et al., 1988); the functional and technical model of Grőnroos (1984); the three-component model by Rust and Oliver (1994); and the multilevel conceptualization of service quality by Dabholkar et al. (1996). In this model, overall service quality is driven by three primary service dimensions: (1) interaction quality; (2) physical environment quality; and (3) outcome quality. Each primary service dimension consists of three corresponding subdimensions: attitudes,

behaviour and experience (interaction quality); ambient conditions, design and social factors (physical environment quality); and waiting time, tangibles and valence (outcome quality).

Brady and Cronin (2001) claim that customers aggregate their evaluations of the subdimensions to form their perceptions of an organization's performance on each of the three primary service dimensions. Those perceptions then lead to an overall perception of service quality. Adopting the perception-only paradigm introduced by Cronin and Taylor (1992), Brady and Cronin (2001) obtained strong support that their multidimensional, hierarchical model measured service quality through qualitative and empirical research.

The Integrated Hierarchical model conceptualisation is believed to be the most comprehensive and up-to-date service quality model, albeit with some modifications and adjustments to suit particular service sectors (Dagger & Sweeney 2004; Ko & Pastore 2004). This view is supported by Chahal and Kumari (2010) who claim that the hierarchical model is more comprehensive and extensive than other existing service quality models. In fact, Zhou (2004) claims that a hierarchical/multilevel model provides more diagnostic value for understanding customer satisfaction and behavioural outcomes, and that it is more robust and statistically testable. Many subsequent studies on service quality have used this multidimensional, hierarchical model and found strong supporting evidence in various services such as mobile communications (Clemes et al., 2014), mobile health (Akter et al., 2013), airlines (Wu & Cheng, 2013), sports (Clemes et al., 2011a), health care (Chahal & Kumari, 2010; Dagger et al., 2007), the motel industry (Clemes et al., 2011b), travel agencies (Martínez Caro & Martínez García, 2008), urgent transport services (Martínez Caro & Martínez García, 2007), higher education (Clemes et al., 2007; 2013) and retail banking (Hossain et al., 2014).

### 2.2.6 Measuring Service Quality in Banking

A great deal of research exists on measuring bank service quality focusing on the SERVQUAL scale. Several studies demonstrate that both developed countries (Ladhari et al., 2011a; Baumann et al., 2007; Petridou, Spathis, Glaveli, & Liassides, 2007; Ibrahim, Joseph, & Ibeh, 2006; Arasli et al., 2005a; Jabnoun & Al-Tamimi, 2003; Adlaigan & Buttle, 2002; Newman, 2001; Avkiran, 1994; Blanchard & Galloway, 1994) and developing countries such as Malaysia (Abdullah, Suhaimi, Saban, & Hamali, 2011; Kheng, Mahamad, Ramayah, & Mosahab, 2010; Munusamy et al., 2010; Kumar et al., 2010; Kumar et al., 2009; Amin & Isa, 2008; Tahir & Abu Bakar, 2007; Guriting & Ndubisi, 2006; Izah & Wan Zulqurnain, 2005)

have used the SERVQUAL instrument to measure service quality. Mixed results have been reported.

Three categories of SERVQUAL-related studies have been identified from the literature. First, replication studies have assessed the applicability of the SERVQUAL model to the retailing banking industry (Vera & Trujillo, 2013; Arasli et al., 2005a; Newman, 2001; Angur et al., 1999; Blanchard & Galloway, 1994). For example, Blanchard and Galloway (1994) interviewed 439 current account customers and 39 bank staff and concluded that the bank staff sample confirms the gaps approach, providing support for the SERVQUAL scale within UK retail banking.

In contrast, several researchers claim that the five dimensions of SERVQUAL cannot be replicated and confirmed in banking. Arasli et al. (2005a) found only four dimensions were significant in the Cyprian banking sector (tangibles, reliability, assurance and empathy). The responsiveness dimension was removed because of factor loadings of less than 0.50 (Hair et al., 2010). Cui et al. (2003) reveal that the psychometric dimensions and measurement items identified by Parasuraman et al. (1988) were not confirmed in the banking context in South Korea. In addition, Newman (2001) argued that the SERVQUAL model does not appear to be a holistic model and doubted the value of SERVQUAL as a measure of service quality in retail banking. Karatepe, Yavas, and Babakus, (2005) used a modified SERVQUAL scale and identified a four-dimensional (service environment, interaction quality, empathy and reliability) model of service quality in banking in northern Cyprus.

Second, there are comparison studies of SERVQUAL with other types of service quality models. For example, Cronin and Taylor (1992) compared SERVQUAL with the three other models, i.e., 1) SERVPERF, 2) an importance-weighted version of the SERVQUAL scale, and 3) an importance-weighted version of the SERVPERF scale. The study was conducted in the USA and covered four industries: banking, pest control, dry cleaning and fast food. Cronin and Taylor (1992) reported that the five dimensional structure of SERVQUAL could not be replicated, and instead the scores yielded a uni-dimensional model of service quality. They concluded that the SERVPERF scale (performance based) was a more appropriate way to measure service quality. In contrast, Angur et al. (1999) reported that in retail banking in India, the SERVQUAL scale provides much greater diagnostic information about service quality gaps, than the SERVPERF scale does. Lassar, Manolis, & Winsor (2000) conducted a study comparing SERVQUAL and Grőnroos's (1984) Technical/Functional Quality with 65 international private banking customers. The aim was

to empirically compare the ability of both models to predict levels of customer satisfaction. The results confirmed that Grőnroos's (1984) model was superior to SERVQUAL as a predictor of customer satisfaction (Lassar et al., 2000).

Third, researchers have developed niche models that can outperform SERVQUAL in specific banking service contexts but they have not been used as extensively as SERVQUAL (Ladhari et al., 2011a). Avkiran (1994) proposed a scale called BANKSERV, to survey 791 retail banking customers in Australia. Based on his model, four discriminating dimensions were suggested: *staff conduct, credibility, communication* and *access to teller services*, with 17 items identified.

A study by Bahia and Nantel (2000) in Canada produced a new model, the Banking Service Quality (BSQ) model, by combining the SERVQUAL items with additional items that stem from marketing mix framework sampling. BSQ consists of 31 items with six dimensions: i.e. *effective and assurance; access; price; tangibles; services portfolio;* and *reliability*. Bahia and Nantel (2000) compared SERVQUAL and BSQ and the results demonstrate that BSQ is more reliable than SERVQUAL. However, there are limitations in terms of the construction of the BSQ scale which, as Bahia and Nantel (2000) note, are based on "expert" opinions and published literature. Bahia and Nantel (2000) developed the scale without taking bank customers' perceptions into consideration. In addition, the model considers "price" to be one of the dimensions in measuring bank service quality. The argument is that, based on a previous study, service quality does not generally depend on price (Anderson et al., 1994). This assumption is supported by Dabholkar et al. (1996) who contend that price is not part of the generally accepted understanding as noted in the literature, of service quality. Price is usually viewed as a determinant of service value.

Aldlaigan and Buttle (2002) introduced SYSTRA-SQ to measure bank service quality based on the Grőnroos (1984) model. They developed and validated a new 21 item scale comprising four dimensions: *service system quality*, *behavioural service quality*, *service transactional accuracy* and *machine service quality*.

In summary, a review of the marketing literature shows that although a hierarchical service quality model in retail banking has been developed (Hossain et al., 2014), so far, there has been no empirical investigation that considers Brady and Cronin's (2001) model as a method to measure retail bank service quality in Malaysia. Consequently, there are theoretical and methodological criticsms of the SERVQUAL instrument as well as the complication of the "cultural context" nature of service quality (Cui et al., 2003) which this study seeks to address. This study therefore develops a service quality model of the Malaysian retail

banking industry and seeks to address the criticisms and therefore close the gap in the literature. The primary dimensions and subdimensions of bank service quality identified in the model are further discussed in the following subsection.

### 2.2.7 Primary Dimensions of Service Quality

Banks are aware that delivering a superior quality service to customers is crucial for success and survival in today's global, competitive banking environment (Hossain et al., 2014; Ladhari et al., 2011a; Wang et al., 2003). Thus, bank managers realise that to successfully leverage service quality to gain a competitive edge, they first need to correctly identify the antecedents of what the consumers perceive as service "quality" (Petridou et al., 2007). In this study, a multidimensional and hierarchical model is employed to identify the dimensions of retail banking service quality as perceived by Malaysian bank customers. The model will be based on the theoretical foundation developed by Dabholkar et al. (1996) and Brady and Cronin (2001). The following sections review the service marketing literature as it relates to the primary dimensions of service quality.

#### 2.2.7.1 Interaction Quality

Bank service quality is typically assessed by evaluating the service-provider's relationships with their customers (Ehigie, 2006), necessary because of the intangible nature of services. Much research has shown that interaction quality is the most significant dimension of service quality, including in banking (Hossain et al., 2014; Karatepe et al., 2005; Hartline & Ferrell, 1996; Bitner & Hubbert, 1994; Grönroos, 1984). Although recent technology advances may indicate that interpersonal relationships are no longer significant in banking, previous studies (Ladhari et al., 2011a; Arasli et al., 2005b; Malhotra et al., 2005) reveal the continued importance of interpersonal relationships between customers and banking staff.

According to Arasli et al. (2005b, p. 2), even "as electronic banking becomes more prevalent, customers still tend to measure a bank's service quality in terms of the personal support they receive, rather than the technical support". Indeed, interaction quality has a key role and remains important in the evaluation of the overall service quality of banks (Arasli et al., 2005a).

The nature of the quality of the interaction in the service encounter between the customer and the service provider is a key determinant of a customer's evaluation of service quality (Dagger et al., 2007; Brady & Cronin, 2001; Dabholkar et al., 2000; Bitner et al.,

1990). According to Dagger et al. (2007, p. 126), "services are produced, distributed, and consumed in the interaction between a service provider and a customer, the interpersonal process is crucial to the customer's ultimate perception of the service provider's performance".

Therefore, interaction quality reflects the quality of a customer's interaction with the service provider during service delivery (Hossain et al., 2014; Lu et al., 2009; Dagger et al., 2007; Brady & Cronin, 2001; Grőnroos, 1984, 1982). This relates to the customer's perception of the manner in which the service is delivered during a service encounter (Lemke, Clark, & Wilson, 2011) in which the attitude, behaviour, and expertise of the service officer are highlighted (Ko & Pastore et al., 2004). In a banking context, the interactions between a customer and the bank are performed through the tellers and other employees via banking counters, personal financial assistance and telephone banking facilities.

#### 2.2.7.2 Physical Environment Quality

According to Bitner (1990), customers make judgements about service quality on the basis of the tangibles aspect, e.g., the buildings and physical layout that surround the service environment, probably because of the intangible nature of service quality. Many authors such as Grőnroos (1984), Zeithaml (1988), and Brady and Cronin (2001) consider the environment quality or tangible dimension has an important influence on the evaluation of service quality. However, the physical environment or tangible attributes are of varying importance to perceived quality, depending on the service type (Reimer & Kuehn, 2005). In banking studies, the tangibles dimension has proven to be a significant factor (Hossain et al., 2014; Beerli et al., 2004; Yavas et al., 2004) and appears to be important in the Malaysian context. This is because branch banking and ATMs remain the most common and popular methods for conducting banking transactions despite the Malaysian authorities encouraging the adoption of new technology in banking (Kumar et al., 2010; Guriting & Ndubisi, 2006). This finding is consistent with the World Retail Banking Report (2012)[7], which records that a branch continues to have the highest customer experience level and maintains the most important distribution channel in banking. The report demonstrates that customers continue to value person-to-person contact (Molina, Consuegra, & Esteban, 2007).

Branch banking is preferred by most Malaysians, partly because most of the difficult and sophisticated transactions cannot be solved through other banking channels. These include: opening an account, mortgages, making remittances, face-to-face service encounters

[7] http://www.capgemini.com/resource-file-access/resource/pdf/World_Retail_Report_2012_pdf

where personal identification is essential, and withdrawing money beyond certain limits (Kumar et al., 2010; Guriting & Ndubisi, 2006; Wan et al., 2005). ATMs are also preferred because they are fast and automated, and the machines are conveniently located by certain banks. The phone banking channel was least popular among Malaysians (Kumar et al., 2010; Guriting & Ndubisi, 2006). However, ATM machines, cash deposit machines, and cheque deposit machines can be considered as physical facilities. According to Baumann, Burton, and Elliott (2005) and Yavas et al. (2004), improvements in tangible components such as the look of the physical facilities and the employees, and upgrades in ambient settings and spatial layout, are expected to pay dividends and lead to positive word-of-mouth comments, a willingness to remain with the bank and increased loyalty.

#### 2.2.7.3 Outcome Quality

In addition to interaction and physical environment quality, outcome quality is also important when measuring perceptions of service quality (Clemes et al., 2014, 2011, 2007). There is agreement in the literature that the outcome of the service encounter significantly influences customer perceptions of service quality (Hossain et al., 2014; Fullerton, 2005; Carman, 2000; McDougall & Levesque, 1994; Lehtinen & Lehtinen, 1991; Grőnroos, 1990). Outcome was labelled "technical quality" by Grönroos (1984, p. 38), who defined it as "what the customer is left with after service delivery is complete". Brady and Cronin (2001) also describe outcome quality as the customer's evaluation of the result of the service act, including the punctuality of the service provider. Simply put, outcome quality reflects the customer's perception of the superiority of the service experience (Kang & James, 2004; Brady & Cronin, 2001; Grönroos, 1984, 1982). Most authors agree that service comprises an outcome component and a process component, where outcome is the achievement (or not) by the customer of some end; e.g., cash from an ATM, an appropriate insurance policy, or a loan from a financial institution (Blanchard & Galloway, 1994).

### 2.2.8 The Relationship between Service Quality and Overall Customer Satisfaction

The relationship between service quality and customer satisfaction has been studied extensively and the empirical evidence suggests that service quality significantly influences customer satisfaction (Zhao et al., 2012). This relationship presumes that customer satisfaction is improved by delivering a superior service quality to the customers. There is considerable theoretical and empirical support evident in the literature that, service quality acts as a strong predictor of customer satisfaction (Clemes et al., 2014, 2013, 2011b; Akter et

al., 2013; Srivastava & Sharma, 2013; Gera, 2011; Carlson & O'Cass, 2010; Chen & Chen, 2010; Culiberg & Rojšek, 2010; Gounaris et al., 2010; Rod et al., 2009; Baumann et al., 2007; Dagger et al., 2007; Ndubisi, 2006; Arasli et al., 2005a; Jamal & Naser, 2002; Sureshchandar, Rajendran, & Anantharaman, 2002; Brady & Robertson, 2001; Cronin et al., 2000; Lassar et al., 2000; Levesque & McDougall, 1996; Anderson et al., 1994; Cronin & Taylor, 1992).

With regard to this correlation where customer satisfaction is depicted as an outcome of service quality perceptions, customer satisfaction is described by Anderson et al. (1994) as a post-consumption evaluation of perceived quality. This is important since the direction of the causal link between service quality and customer satisfaction is likely to lead to different customer behaviour outcomes, such as positive word-of-mouth comments, willingness to pay a premium-price, and cross-buying of financial services (Ehigie, 2006; Ndubisi, 2006; Winstanley, 1997) which in turn, may improve customer retention and profitability (Busacca & Giovanna, 2005; Lassar et al., 2000; Cronin & Taylor, 1992). Because of the intangible nature of services (including financial services), the service quality and customer satisfaction relationship is particularly crucial (Karatepe et al., 2005; Holmlund & Kock, 1996; Parasuraman et al., 1985).

Research in various industries has empirically confirmed the positive relationship between service quality (its dimensions) and customer satisfaction; such as in mobile telecommunications (Clemes et al., 2014; Srivastava & Sharma, 2013; Lai et al., 2009), higher education (Clemes et al., 2013), hospitals (Choi & Kim, 2013), e-service websites (Carlson & O'Cass, 2010), restaurants (Gilbert, Veloutsou, Goode, & Moutinho, 2004), hotel services (Voss et al., 1998), travel agencies (Bitner, 1990), internet services (Van Riel et al., 2001), multiple industries (Cronin et al., 2000), dry cleaning, banking, pest control, and fast food (Cronin & Taylor, 1992), and automobile repairs, petrol stations, and banking (Bei & Chiao, 2006). Brady et al. (2005) reveal that service quality has had a positive impact on satisfaction in five countries: the USA, Australia, the Netherlands, Hong Kong, and Morocco.

In retail banking, as in other service industries, delivering superior service quality enhances customer satisfaction and contributes to profitability (Ladhari et al., 2011b). The same empirical results have been reported in several countries. Lassar et al. (2000) reveal that a technical/functional quality-based model of service quality is a reliable predictor of satisfaction in the USA and South America. A study by Jamal and Naser (2002) of the Abu Dhabi Commercial Bank (ADCB), United Arab Emirates (UAE) has found that the core and relational dimensions of service quality are important determinants of customer satisfaction.

Similarly, Mohd Kassim and Souiden (2007) report a positive influence of service quality on satisfaction in the retail banking sector in the UAE.

Using the SERVQUAL instrument, Ladhari et al. (2011a) compared the perceptions of service quality of Tunisian and Canadian bank customers. The results reveal that empathy is the most important dimension that influences both satisfaction and loyalty in Canada. However, in Tunisia, reliability and responsiveness are the most influential dimensions. A study on a Greek Cypriot bank in Turkey found that to satisfy customers, the bank uses service quality to achieve customer satisfaction (Arasli et al., 2005a). They report that assurance, reliability, empathy and the tangible dimensions of service quality are predictors of customer satisfaction in the Cyprian banking sector.

Ehigie (2006) found that in Nigeria, service quality and satisfaction are positively related to customer loyalty. Further, Baumann et al., (2007) report that all service quality dimensions except tangibility, impact on customer satisfaction in Australian banking. A study by Rod et al. (2009) confirms that service quality has a positive relationship with customer satisfaction. Essentially, the study is about overall internet banking service quality in New Zealand. Rod et al. (2009) claim that the more positive a customer's perceptions of online service quality, the better their overall satisfaction with the bank is likely to be. Similarly, in the context of automated banking service quality, in Australia service quality dimensions affect customer satisfaction (Al-Hawari & Ward, 2006). Recently, a study by Fatima and Razzaque (2014) on the impact of core and relational service qualities of commercial banks on customer satisfaction, was tested in Bangladesh. The results suggest a positive relationship between the constructs.

Ultimately, it has been widely accepted that service quality acts as an antecedent of customer satisfaction, and focusing on this relationship is becoming crucial with the increased levels of awareness among bank customers of the importance of receiving good quality service (Sureshchandar et al., 2002).

### 2.2.9 The Relationship between Service Quality and Behavioural Intentions

Studies on service quality and behavioural intentions and loyalty, have produced inconsistent results. Many researchers suggest that service quality could affect customer loyalty either directly (Choudhury, 2013; Baumann et al., 2007; Dagger et al., 2007; Lobo et al., 2007; Olorunniwo et al., 2006; Petrick, 2004; Alexandris et al., 2002; Baker & Crompton, 2000; Cronin et al., 2000; Bloemer, de Ruyter, & Wetzels, 1999; Zeithaml et al., 1996; Rust & Zahorik, 1993), or indirectly (Murti, Deshpande, & Srivastava, 2013; Karatepe, 2011;

Gounaris et al., 2010; Ladhari, 2009b; Cristobal, Flavián, & Guinalíu, 2007; Ehigie, 2006; Olorunniwo et al., 2006; Caruana, 2002; Brady & Robertson, 2001; Cronin et al., 2000; Bloemer et al., 1998; Anderson & Sullivan, 1993). For the direct effect, it has been argued that superior service quality enhances customers' favourable behavioural intentions; such as being willing to buy more, cross-buying, being less price sensitive, and telling others about their positive experiences (Bolton, Kannan, & Bramlett, 2000; Zeithaml et al., 1996; Rust et al., 1995; Anderson et al., 1994). Empirically, this assumption is supported by numerous studies that have consistently found a positive impact of service quality on customers' favourable behavioural intentions (i.e., intention to purchase, repurchase, and word-of-mouth recommendations). In addition, the effects of different service quality dimensions on behavioural intentions have also been tested in different service industries; such as agri-food (Mason & Nassivera, 2013), health care (Li, Huang, & Yang, 2011), the transport industry (Wu, Liu, & Hsu, 2008) hairdressing and local telephone services (Pollack, 2009), retail chains (Wong & Sohal, 2003), hotels (Alexandris et al., 2002), travel agencies (Lobo et al., 2007), and computer manufacturers, retail chains, automobile insurers, and life insurers (Zeithaml et al., 1996).

Zeithaml et al. (1996) mention that service quality influences different intentions, such as giving recommendations, doing more business and the willingness to pay more in multi-service scenarios (i.e., computer manufacturing, retail chains, automobile insurers, and life insurers). Even in banking, much evidence shows that a direct impact exists between service quality and behavioural intentions, because the more customers perceive high quality in the services delivered, the more they intend to stay with the bank (Choudhury, 2013; Kumar et al., 2010; Ehigie, 2006; Koutouvalas & Siomkos, 2006; Lam & Burton, 2006; Bell, Auh, & Smalley, 2005; Karatepe et al., 2005; Yavas et al., 2004; Bloemer et al., 1998; Boulding et al., 1993). Bloemer et al. (1998) found that service quality influences customer loyalty in retail banks in the Netherlands. A study in Greece by Koutouvalas and Siomkos (2006) examined the relationship between perceived service quality and loyalty, in both private and public banks. The authors found a positive relationship between service quality and the loyalty of customers in both types of banks, but the relationship was stronger among private bank customers. Yavas et al. (2004) report that bank service quality dimensions are directly linked to behavioural outcomes; such as word-of-mouth comments, recommendations, and switching. Boulding et al. (1993) report that overall service quality perceptions are positively related to the willingness to recommend. Finally, Kumar et al. (2010) examined the effect of overall service quality on loyalty in the context of private banking, and displayed strong

support for the view that enhancing service quality can directly increase favourable behavioural intentions.

Though many studies have found a direct relationship between service quality and behavioural intentions in several areas, including banking, an indirect relationship has also been discovered. For example, Cronin et al. (2000), using a sample from six industries (spectator sports, participative sports, entertainment, healthcare, long-distance carrier services, and fast food), conclude that a direct link between service quality and behavioural intentions is significant. However, when the data sets for the industries were tested individually, they discovered that service quality has a direct effect on the behavioural intentions only in four of the six industries. The exceptions are health care and the long-distance carrier services industries. Hsin-Hui Lin (2011) who conducted research on the mobile phone industry in Taiwan using the partial least squares approach, concludes that service quality dimensions affect customer loyalty indirectly and directly. Chen and Chen (2010) and Lai et al., (2009) found no direct relationships between service quality and behavioural intentions and loyalty, in heritage tourism in Taiwan and mobile communications in China.

Review of the relevant literature shows that customer satisfaction mediates the impact of service quality on behavioural intentions and loyalty in several service industries (Chen & Chen, 2010; Ladhari, 2009b; Qin & Prybutok, 2008; Ibanez et al., 2006; Choi, Cho, Lee, Lee, & Kim, 2004; Brady & Robertson, 2001; Cronin et al., 2000; Caruana et al., 2000; Shemwell, Yavas, & Bilgin, 1998). In the health care context, Murti et al. (2013) and Mpinganjira (2008) report that patients' overall satisfaction is a mediating variable between service quality perceptions and positive behavioural intentions. Murti et al. (2013) and Mpinganjira's (2008) results support research findings by other researchers such as Brady and Robertson (2001) in the fast food industry and Ladhari (2009b) in the hotel industry.

In banking, Ladhari et al. (2011b) also confirm customer satisfaction as mediating variables between service quality and loyalty. The result is consistent with the results of studies by Mosahab, Mahamad, and Ramayah (2010), Bei and Chiao (2006), and Caruana (2002).

### 2.3 Perceived Value

In today's world of intense competition, focusing on marketing constructs such as satisfaction and service quality may not be sufficient (Gallarza & Gil Saura, 2006). Another important concept discussed in recent research is perceived value (Roig et al., 2013;

Boksberger & Melsen, 2011; Korda & Snoj, 2010; Sanchez, Callarisa, Rodrıguez, & Moliner, 2006). From a managerial viewpoint, generating a higher value for the customer is a key in acquiring a competitive advantage and long term success (Parasuraman, 1997; Woodruff, 1997; Porter, 1985). Developing customer perceived value may provide a new means for differentiating a service offering from that of competitors (Roig et al., 2006; Bick, Brown, & Abratt, 2004).

Perceived value has been described as the benefits or the utility stemming from a product, service or relationship as perceived by a customer based on what was received and what was given (Yang & Peterson, 2004; Eggert & Ulaga, 2002; Teas & Agarwal, 2000; Zeithaml, 1988). Utility, according to Zeithaml (1988), is basically the same as the economist's definition of utility - the ability to satisfy wants. More specifically, perceived value signifies the trade-off between costs and benefits and arises from both quality and price (Heinonen, 2004; Lee & Cunningham, 2001; Nguyen & LeBlanc, 1998).

According to Parasuraman et al. (1985), only the customer rather than the service provider can evaluate whether a service provides value. However, the concept of customer perceived value is very subjective (Parasuraman et al., 1985). It is believed that customers recognise and value an outstanding service when delivered to them and over time, they show loyalty behaviours (Chi & Gursoy, 2009).

The literature on financial services indicates that banks should focus their efforts on consumers' perceived value (Roig et al., 2013; Korda & Snoj, 2010). Angur et al. (1999) claim that perceived value is a significant element of high consumer involvement industries, such as the banking industry. Banks realize that customers will be loyal if they can produce or deliver greater value than competitors (Roig et al., 2013; Dawes & Swailes, 1999).

### 2.3.1 The Relationship between Service Quality and Perceived Value

The quality of service is a fundamental element in the perception of perceived value, as it is the most difficult thing for competitors to imitate (Parasuraman & Grewal, 2000) and is the basis on which differentiation (Berry, 1995) and competitive advantage (Reichheld & Sasser, 1990) are sustained. Generally, the link between quality and value provides a wide consensus, quality being an input to value (Gallarza & Gil Saura, 2006). Parasuraman and Grewal (2000) agree that perceived service quality enhances perceived service value which in turn, contributes to customers loyalty.

The positive effect of service quality on perceived value has been well documented for different industries such as; life insurance (Gera, 2011), mobile communications (Clemes

et al., 2014; Lai et al., 2009), higher education (Clemes, 2013), banking (Korda & Snoj, 2010), heritage tourism (Chen & Chen, 2010), airlines (Chen, 2008), cruise passengers (Petrick, 2004), health care (Choi et al., 2004), multiple industries (Cronin et al., 2000) and public transit (Lai & Chen, 2011). Bolton and Drew (1991) found that specific telephone services (i.e., billing, local calls, and distance calls) are positively linked to overall service quality, which in turn, is positively linked to service value. This result is supported by Chen (2008) who discovered that the level of quality is among the important determinants of customer perceived value in the airline industry.

Cronin et al. (2000) found a positive effect of overall service quality on perceived value, from six different industries (i.e. spectator sports, participative sports, entertainment, health care, long-distance carriers and fast food). Further, Petrick (2004) claims that perceived service quality is a direct antecedent and best predictor, of perceived service value. In another study, the agent's service quality was found to be a significant predictor of value perception in life insurance services in India (Gera, 2011). Lai et al. (2009) and Wang et al. (2004) reached similar conclusions in their study of the Chinese mobile-telecommunications market. However, despite recognition of the significance of the relationship between service quality and perceived value in various industries, the relationship has not been adequately studied in the banking industry (Vera & Trujillo, 2013; Korda & Snoj, 2010).

### 2.3.2 The Relationship between Perceived Value and Satisfaction

Conceptual frameworks have been developed that integrate customer perceived value and customer satisfaction (Woodruff, 1997; Heskett et al., 1994; Storbacka, Strandvik, & Grönroos, 1994). According to Korda and Snoj (2010, p. 192), "perceived service value could be one of the important sources of a company's competitive advantage and is also an important predictor of customer satisfaction..." In fact, many studies have offered empirical evidence of the causal relationships between perceived value and satisfaction in various industries including; banking (Roig et al., 2013; Korda & Snoj, 2010), mobile communications (Clemes et al., 2014; Lai et al., 2009), the hotel industry (Oh, 1999), upscale Chinese restaurants (Ryu et al., 2012), tourism (Kim, Holland, & Han, 2013; Chen & Chen, 2010; Gallarza & Gil Saura, 2006; Andreassen & Lindestad, 1998), airlines (Chen, 2008), TV travel product shopping (Chen & Tsai, 2008), internet service providers (Chiou, 2004), multiple industries (Cronin et al., 2000; McDougall & Levesque, 2000), internet markets (Yang & Peterson, 2004), golf travellers (Petrick & Backman, 2002), retail (Loureiro,

Miranda, & Breazeale, 2014; Sweeney et al., 1999), health services (Moliner, 2009), and consultancy (Patterson & Spreng, 1997).

For example, McDougall and Levesque (2000) report that service quality and customer perceived value are the two most significant antecedents of customer satisfaction across four service industries: restaurants, auto services, hairstylists, and dental services. Chen (2008) and Chiou (2004) further confirm that customer perceived value is an important driver of customer satisfaction towards airlines and internet service providers. A study by Gallarza and Saura (2006), which focuses on students' travel behaviour in Spain, also confirms that satisfaction is the behavioural consequence of perceived value. Similarly, a study by Lai et al. (2009) reveals that perceived value is an important antecedent of satisfaction in mobile communications in China.

In retail banking, Bontis et al., (2007) agree that perceived value is an antecedent and has a positive and direct effect on customer satisfaction in the USA. More recently, Roig et al., (2013) found perceived value has a direct, positive effect on customer satisfaction in Spain. They define perceived value as a multidimensional construct and divide it into three dimensions: perceived value of benefits (functional), perceived value of sacrifices, and perceived value of benefits (emotional). Perceived value of sacrifices is not significant but perceived value of benefits (functional) and perceived value of benefits (emotional) contribute the highest value to overall satisfaction.

### 2.3.3 The Relationship between Perceived Value and Behavioural Intentions

Slater (1997) and Woodruff (1997) suggest that companies shift their strategies for customer retention toward superior customer value delivery, because customer value has both the costs and the benefits of staying with a company and as such, are strong drivers of customer retention. This suggestion is supported by Reichheld (1996) who claims that consumers are keen to be loyal to companies that can deliver superior value relative to the offerings of competitors. Likewise, perceived value also affects intentions to recommend and repurchase (Parasuraman & Grewal, 2000).

A number of prior studies identify perceived value as a major determinant of behavioural intentions in various industries (Suhartanto et al., 2013; Lai & Chen, 2011; Chen & Chen, 2010; Hu et al., 2009; Lai et al., 2009; Chen, 2008; Lewis & Soureli, 2006; Durvasula et al., 2004; Petrick, 2004; Yang & Peterson 2004; Sirdeshmukh, Singh, & Sabol, 2002; Cronin et al., 2000; Oh, 2000; Sweeney et al., 1999; Oh, 1999; Nguyen & LeBlanc, 1998; Bolton & Drew, 1991). For example, Bolton and Drew (1991) identify perceived value

as a major determinant of customer loyalty in telephone services; Sirdeshmukh et al. (2002) in airline travel and retail services, Hu et al. (2009) in the hotel industry, Lai et al. (2009) in the mobile communications industry, Chen and Chen (2010) in heritage tourism, Petrick (2004) in the cruise line industry, Durvasula et al. (2004) in the life insurance industry, Yang and Peterson (2004) in online services, Choi et al. (2004) in health care, and Chen (2008) who confirms that perceived value has a direct influence on airline passengers' behavioural intentions in Taiwan. Oh (2000) measured fine-dining patrons' perceptions of quality, value, and satisfaction both before and after their dining experience. The results reveal that value is a superior predictor of repurchase intentions, both pre- and post-experience.

The results of these studies confirm the influential role perceived value has in consumers' repurchase intentions and in how the purchase experience is spread to others (word-of-mouth intentions). Chen (2008) and Durvasula et al. (2004) reveal that perceived value is a better predictor of customers' willingness to recommend to others, than satisfaction. However, there is little evidence of the relationship between perceived value and behavioural intentions in the banking literature (Lewis & Soureli, 2006; Nguyen & LeBlanc, 1998).

### 2.4 Switching Costs

Switching costs are recognized as a means of keeping customers in relationships, regardless of their satisfaction with the provider (Bansal, Irving, & Taylor, 2004; Burnham, Frels, & Mahajan, 2003). Switching costs have been cited in several industries (Clemes et al., 2014; Jones et al., 2007; Patterson, Mandhachitara, & Smith, 2001; Fornell, 1992) including retail banking (Clemes et al., 2010; Beerli et al., 2004). In fact, switching costs become important especially when there are a number of players in the industry, since customers have several options in choosing their service provider (Clemes et al., 2014; Lee, Lee, & Feick, 2001).

According to Patterson (2004), the theoretical foundations for the study of switching costs in a service context can be found in the social exchange theory of Emerson (1976) and Homans (1958). Basically, switching costs are the costs involved in switching from one service provider to another (Burnham et al., 2003; Lee & Cunningham, 2001; Porter, 1998) that makes changing service providers expensive (Grønhaug & Gilly, 1991). The costs involve measuring not only the monetary costs, but also the psychological costs of becoming a customer of a new provider, as well as the time and effort involved in the purchase of new products or services (Matthews & Murray, 2007; Kim, Kliger, & Vale, 2003; Dick & Basu, 1994). Additionally, customers may face high risks in changing to an alternative provider

because a service cannot be evaluated before the actual purchase, (i.e., customers face the uncertainty of whether they will find a better alternative) (Caruana, 2004). As these costs increase, customers are less likely to shift to a competitor (Jones, Mothersbaugh, & Beatty 2000; Sharma & Patterson, 2000; de Ruyter, Wetzels, & Bloemer, 1998). This is why some service providers make an effort to incorporate switching costs into their marketing strategies (Fornell, 1992; Heskett et al., 1990).

Burnham et al. (2003) claim that switching costs are multidimensional and divide them into three categories: procedural, relational and financial. Procedural switching costs refer to the time, effort and/or hassle the consumer anticipates will be involved with switching. Relational switching costs are the costs related to the potential loss of personal relationships that customers have built with a service provider's employees. Financial costs are the potential loss of special discounts and unique benefits when the consumer switches from her or his current service provider to another.

In this current study, switching costs are considered to be any barrier that makes it difficult or costly (psychologically, relationally, economically) to change service providers (Clemes et al., 2014; Patterson, 2004; Burnham et al., 2003; Jones & Sasser, 1995), or the set of additional costs required for retail banking customers to terminate their relationship with their current bank and secure an alternative one (Porter, 1998). For the banking industry, switching costs can be interpreted in terms of money, time and effort, such as transferring funds, opening new accounts, closing the old accounts, and registering for online banking systems (Goddard, Molyneux, Wilson, & Tavakoli, 2007).

### 2.4.1 The Relationship between Service Quality and Switching Costs

A high level of service quality delivered by service providers may help to act as a switching barrier. This view is based on the results of Clemes et al. (2014) and Aydin, Özer, and Arasil's (2005) studies on the Chinese and Turkish mobile communications markets, respectively. They found that customers' perceptions of service quality positively influences switching costs (Clemes et al., 2014; Aydin et al., 2005). Aydin et al. (2005) argue that when customers perceive a high level of service quality from their current service provider, the customers' perceptions of switching costs are likely to be high. Additionally, research by Meng and Elliot (2009) suggest a significant positive relationship between service quality and switching costs. Some studies even suggest that the creation of switching costs could be used to complement customer retention strategies, because switching costs help businesses overcome fluctuations in service quality (Jones et al., 2000). Therefore, companies would be

able to "get away with" poor service quality at times, because customers perceive high costs in changing to another service provider (Meng & Elliot, 2009).

### 2.4.2 The Relationship between Switching Costs and Behavioural Intentions

Customer switching costs have also been identified as having a positive influence on customer loyalty, retention and commitment (Clemes et al., 2014; Jones et al., 2007; Burnham et al., 2003; Patterson & Smith, 2003; Ranaweera & Neely, 2003; Bendapudi & Berry, 1997; Dick & Basu, 1994) which in turn, could lead to an increase in market share and profitability. According to de Matos et al. (2013) and Beerli et al. (2004), in addition to customer satisfaction, switching costs also closely relate to behavioural intentions in the banking industry.

Switching costs have been regarded as a barrier that holds customers in service relationships. Therefore, companies are now targeting switching costs in their marketing activities in order to manipulate this penalty (Burnham et al., 2003). This scenario means that when switching costs are high, customer loyalty intentions increase (Lee & Cunningham, 2001; Jones et al., 2000; Andreassen & Lindestad, 1998; Dick & Basu, 1994; Ping, 1993) and service firms may continue to retain customers even if they are not completely satisfied (Ranaweera & Neely, 2003). Lee et al. (2001) and Ranaweera and Prabhu (2003) tested and confirmed the positive effect of switching costs on customer retention (i.e. customer repurchase intentions) in mobile phone services in France and the fixed line telephone market in the UK, respectively. There is also empirical support for considering switching costs as an antecedent of loyalty in other service industries including; banking, credit cards, and telecommunications (Lam, Shankar, Erramilli, & Murthy, 2004; Burnham et al., 2003; Jones, Mothersbaugh, & Beatty, 2002, 2000; Anderson et al., 1994). In retail banking, Baumann et al. (2012), de Matos et al. (2009) and Beerli et al. (2004) show that customers' switching costs have a direct impact on loyalty and repurchase intentions.

## 2.5 Corporate Image

Image has been used extensively to describe how customers perceive a company, with regard to the products and services it offers, and its reputation (Fathollahzadeh et al., 2011). Earlier, MacInnis and Price (1987) described corporate image as the overall impression made on the minds of customers in which ideas, feelings and previous experiences with an organization are stored in the memory and transformed into meaning. Lai et al. (2009) define corporate image as a perception regarding a company held in customers' memories that

works as a filter, which affects the perception of the business activities run by the company. This is consistent with Nguyen and Leclerc (2011) and Flavian et al. (2004) who claim that image is the range of associations that come to mind when customers hear the name of an organization. A favourable image is perceived as a key aspect of a company's ability to maintain its market position (Faullant, Matzler, & Füller, 2008).

In banking, corporate image is defined as "the net result of the interaction of all experiences, impressions, beliefs, feelings and knowledge that people have about a company (Worcester, 1997). Nguyen and Leblanc (2001) claim that corporate image is related to the physical and behavioural attributes of the company, such as business name, architecture, and the variety of products or services, and to "*the impression*" of quality communicated by each person interacting with clients.

*"The impression"* or perception can be the result of experiences in purchasing and consuming goods, or of information consumers extract from their surroundings without necessarily having had any experiences with the company itself (Andreassen & Lindestad, 1998). Abratt and Mofokeng (2001) claim that the image is built up over time, and in this current study, corporate image is regarded as the overall impression of a company left in a customer's mind (Barich & Kotler, 1991).

Image has been considered a source of competitive advantage because a positive image will help the company attract customers and will have a positive influence on the trust of other interested groups (Hu et al., 2009a). A strong image is the most effective means of differentiation in banking, as well as strengthening customers' confidence in their bank (Hsieh & Li, 2008; Van Heerden & Puth, 1995). Likewise, Bravo, Montaner and Pina (2009) claim that corporate image represents an asset which allows companies to differentiate and increase their success chances especially in highly competitive sectors like banking. Although image was found to be extremely important to service providers (Grőnroos, 1982), early research on corporate image centred largely on manufacturers and retailers, with little work reported on customers' image evaluation in services (Richard & Zhang, 2012).

### 2.5.1 The Relationship between Service Quality and Corporate Image

Although a few studies show that corporate image has a direct impact on perceived service quality (Jones, Mak, & Sim 2007; Andreassen & Lindestad, 1998; Lehtinen & Lehtinen, 1991), others suggest the opposite effect (Clemes et al., 2014, 2013; Wu, Lin, & Hsu, 2011; Hu et al., 2009; Lu et al., 2009; Aydin et al., 2005; Wang et al., 2003; Bloemer et al., 1998; Nguyen & LeBlanc, 1998; Zeithaml et al., 1996). In this current study, corporate

image is expected to be influenced by service quality (Chahal & Kumari, 2010) because, based on Lee and Lee's (2005) study, corporate image is an overall perception accumulated from the customer's experience of service quality. According to Hu, Kandampully and Juwaheer (2009), customers transform the perceived quality of service they receive, into their overall impression of the provider. In fact, in most industries, service quality improvement leads to a positive reputation (Wang et al., 2003) and enhances image (Andreassen & Lindstead, 1998).

Nguyen and LeBlanc (1998) tested the relationship between service quality and corporate image and found that customers who perceive high service quality over repeated service encounters from banking and financial institutions, have an overall favourable image of the company. They suggest that the higher the level of service quality that customers perceive, then the higher the level of a company's brand image that is instilled in the minds of the customers. Ladhari et al. (2011b) and Wang et al. (2003) conclude that service quality leads to superior image and reputation in the banking industry in Tunisia and China. Similar results were found by Clemes et al. (2013) in higher education; Ryu et al. (2012) in upscale Chinese restaurants; Kandampully, Juwaheer, and Hu (2011) and Hu et al. (2009) in the hotel industry; and Clemes et al. (2014), Lai et al. (2009), and Aydin et al. (2005) in mobile communications. They point out that high service quality leads to superior favourable perceptions of corporate image in the various industries.

### 2.5.2 The Relationship between Corporate Image and Satisfaction

According to Grönroos (1984), corporate image performs as a filter of satisfaction in a simplification of the decision making. As corporate image is believed to create a halo effect in customers' judgments about satisfaction, it is suggested that when customers are satisfied with the service they receive from an organisation, their attitude towards the organisation improves and subsequently, this attitude affects these customers' satisfaction levels with the organisation (Andreassen & Lindestad, 1998). In addition, Andreassen and Lindestad (1998) confirm that corporate image has a strong effect on customer satisfaction, specifically if the customer has little knowledge of the service.

Accordingly, a positive relationship between corporate image and satisfaction has been empirically demonstrated in various industries, such as mobile telecommunications (Clemes et al., 2014; Srivastava & Sharma, 2013; Lai et al., 2009), education (Clemes et al., 2013, 2007; Palacio, Meneses, & Perez, 2002), and tourism (Chen & Phou, 2013; Richard & Zhang, 2012; Wang & Hsu, 2010; Andreassen & Lindestad, 1998). For instance, Lai et al.

(2009) verify that corporate image has no positive direct effect on loyalty but has a positive direct effect on satisfaction and value in Chinese mobile telecommunications. Clemes et al. (2013, 2007) confirm that the image of a university has been assessed as an important antecedent of customer satisfaction in China and New Zealand. However, no studies regarding the link between image and customer satisfaction have been reported in banking even though such research deserves more attention.

### 2.5.3 The Relationship between Corporate Image and Behavioural Intentions

A favourable image is viewed as a critical aspect of a company's ability to maintain its market position, because image is closely related to the success of a company, through such things as customer patronage (Korgaonkar, Lund, & Price, 1985). According to Aydin and Özer (2005), the image of a product or service has a great effect on customer loyalty since image is the focal point that customers are first attracted to and it contributes to the decision to purchase the product or service offered by the company. This is consistent with the results of Dick and Basu (1994) and Clemes et al. (2014) who conclude that corporate image serves as an important factor influencing customer loyalty; a favourable image can influence repeat patronage.

Numerous studies have found that corporate image positively relates to loyalty in multiple industries (Clemes et al., 2014; Faullant et al., 2008; Aydin et al., 2005; Hart & Rosenberger, 2004; Hong & Goo, 2004; Johnson et al., 2001; Nguyen & Leblanc, 2001; Kandampully & Suhartanto, 2000; Andreassen & Lindestad, 1998). Nguyen and Leblanc (2001) demonstrate empirically that corporate image positively influences customer loyalty in three sectors: telecommunications, retailing, and education. The same relationship has been demonstrated by Andreassen and Lindestad (1998) for the Norwegian package tour industry, Kandampully and Suhartanto (2000) for the New Zealand hotel industry and Aydin et al. (2005) for telecommunications in Turkey.

A study by Nguyen and LeBlanc (1998) also reveals that a positive bank image is found to be important in retaining bank customers. More recently, Fathollahzadeh et al. (2011), Ladhari et al. (2011b) and Lewis and Soureli (2006) confirm that corporate image is an important antecedent of loyalty in banking. Fathollahzadeh et al. (2011) state that the higher a customers' perceived image of a bank, then the higher is the loyalty that they exhibit.

## 2.6 Summary

This chapter has discussed the relevant literature regarding the constructs that relate to behavioural intentions and the interrelationships between all six constructs; service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions. The conceptualization and measurement of service quality in retail banking based on a hierarchical service quality model approach, has also been presented and discussed.

# Chapter 3
# Research Model and Hypotheses Development

This chapter presents the development of the conceptual model used in this study based on the discussion in Chapter 2. The conceptual model of behavioural intentions depicts the integrated potential relationships that exist between service quality, customer satisfaction, perceived value, bank corporate image, switching costs and behavioural intentions. The 18 hypotheses tested in this study to satisfy this study's objectives are discussed.

## 3.1 Model Development

In this study, a banking behavioural intentions conceptual model (see Figure 3.1) has been developed based on Clemes et al. (2014, 2011, 2010, 2007) model framework. The proposed model demonstrates firstly, the expected relationships that may exist among the six important marketing constructs in the context of the Malaysian retail banking industry. In particular, the conceptual model shows that it is expected that customers' perceptions of service quality will influence customer satisfaction, perceived value, bank corporate image, switching costs and behavioural intentions. Secondly, customer satisfaction, perceived value, bank corporate image, and switching costs are expected to influence behavioural intentions. Thirdly, perceived value and corporate image are expected to influence customer satisfaction.

It is important to note that this conceptual model depicts customer satisfaction, perceived value, corporate image, switching costs and behavioural intentions as higher order constructs. This approach offers a more complete theoretical framework for examining the links between service quality and the higher order constructs (Clemes et al., 2010). The model also conceptualises retail bank service quality as a multidimensional, hierarchical and reflective construct measured at three levels: an overall service quality level, a primary dimension level, and a subdimension level (Hossain et al., 2014).

The primary dimension level consists of three primary dimensions: (1) interaction quality; (2) physical environment quality; and (3) outcome quality. The subdimension level comprising interaction quality is represented by five subdimensions (i.e., attitude, behaviour, expertise, problem solving and information). The physical environment quality subdimension level is represented by four subdimensions (i.e., ambient conditions, equipment, physical appeal, and social factors). Finally, the outcome quality subdimension level is represented by six subdimensions (i.e., waiting time, convenience, valence, security and privacy, reliability,

and speed of decisions and responses). The three primary dimensions together reflect customers' overall service quality perceptions (Brady & Cronin, 2001; Dabholkar et al., 1996).

## 3.2 Hypotheses Development

### 3.2.1 Hypotheses Relating to Research Objective 1

Based on Brady and Cronin's study (2001), there are three major dimension antecedents of overall service quality: interaction quality, physical environment quality and outcome quality, which are categorized as primary dimensions. These three primary dimensions are identified as coherent in the retail banking industry, as discussed in section 2.2.7. Each primary dimension consists of a number of subdimensions (Hossain et al., 2014; Lu et al., 2009; Brady & Cronin, 2001). Martínez Caro and Martínez García (2008) encourage researchers to build industry-specific models instead of replicating a universal conception of service quality models, because the critical factors of service quality are not uniform across all service industries. In addition, a different cultural background may result in different perceptions of service quality (Malhotra et al., 2005; Cui et al., 2003; Stauss & Mang, 1999; Donthu & Yoo, 1998; Winsted, 1997). Therefore, the subdimensions of interaction quality, physical environment quality and outcome quality in this study have been obtained from the literature, through focus group interviews and through exploratory factor analysis, specifically for customers of retail banking in Malaysia (see Section 4.1.1).

#### 3.2.1.1 Interaction Quality

From the literature, researchers have identified the following set of subdimensions that customers evaluate as components of interaction quality that relate to banking services: (a) attitude (Martínez Caro & Martínez García, 2007; Al-Hawari & Ward, 2006; Yavas et al., 2004; Brady & Cronin, 2001; Bahia & Nantel, 2000; Grőnroos, 1990); (b) behaviour (Ehigie, 2006; Yavas et al., 2004; Bahia & Nantel, 2000; Grőnroos, 1990); (c) expertise (Martínez Caro & Martínez García 2008; 2007; Clemes et al., 2007; Arasli et al., 2005a; Brady & Cronin, 2001); (d) problem solving (Clemes et al., 2010; de Matos et al., 2009; Lu et al., 2009; Martínez Caro & Martínez García, 2008; 2007); and (e) information (Lu et al., 2009; Martínez Caro & Martínez García, 2007; Arasli, Mehtap-Smadi & Katircioglu, 2005b; Jabnoun & Al-Tamimi, 2003; Blanchard & Galloway, 1994). These subdimensions are expected to constitute the interaction quality primary dimension. Thus, the first hypothesis is formulated as:

H1: There is a significant positive relationship between the subdimensions of interaction quality (i.e. H1a, H1b, H1c, H1d and H1e)[8] and the interaction quality primary dimension.

#### 3.2.1.2 Physical Environment Quality

From the literature, researchers have identified the following set of subdimensions that customers evaluate as components of the physical environment quality, that relate to banking services: (a) ambient conditions (de Matos et al., 2009; Martínez Caro & Martínez García, 2008; Al-Hawari & Ward, 2006; Ko & Pastore, 2005; Brady & Cronin, 2001; Bahia & Nantel, 2000); (b) equipment (de Matos et al., 2009; Lu et al., 2009; Martínez Caro & Martínez García, 2008; Al-Hawari & Ward, 2006; Ko & Pastore, 2005); (c) physical appeal (Lu et al., 2009; Manrai & Manrai, 2007; Arasli et al., 2005b; Ko & Pastore, 2005; Yavas et al., 2004; Brady & Cronin, 2001; Oppewal & Vriens, 2000; Levesque & McDougall, 1996); and (d) social factors (Brady & Cronin, 2001). These subdimensions are expected to constitute the physical environment quality. Based on these four factors, the second hypothesis is formulated as:

H2: There is a significant positive relationship between the subdimensions of the physical environment quality (i.e. H2a, H2b, H2c, and H2d)[9] and the physical environment quality primary dimension.

#### 3.2.1.3 Outcome Quality

From the literature, researchers have identified the following set of subdimensions that customers evaluate as components of outcome quality that relate to banking services: (a) waiting time (Pollack, 2009; Martínez Caro & Martínez García, 2008; Beerli et al., 2004; Brady & Cronin, 2001); (b) convenience (Kumar et al., 2010; Kumar et al., 2009; Yavas et al., 2004); (c) valence[10] (Lu et al., 2009; Martínez Caro & Martínez García, 2008, 2007; Ko & Pastore, 2005; Brady & Cronin, 2001); (d) security and privacy (Al-Hawari et al., 2005; Joseph & Stone, 2003; Lassar et al., 2000; Ennew, Reed & Binks, 1993); (e) reliability (Rod et al., 2009; Shamdasani, Mukherjee & Malhotra, 2008; Arasli et al., 2005b; Bahia & Nantel,

[8] Note: in Figure 3.1, the subdimensions a, b, c, d, e are labelled A, B, E, PS, I.
[9] Note: in Figure 3.1, the subdimensions a, b, c, d are labelled AC, EQ, PA, SF.
[10] Valence captures attributes that control whether customers believe that service outcome is good or bad, regardless of their evaluation of any other aspect of the experience (Brady & Cronin, 2001; Martínez Caro & Martínez García, 2007; Ko & Pastore, 2005).

2000); and (f) speed of decisions and responses (Shamdasani et al., 2008; Ennew et al., 1993). These subdimensions are expected to positively affect outcome quality. Based on these six factors, the third hypothesis is formulated as:

H3: There is a significant positive relationship between the subdimensions of outcome quality (i.e. H3a, H3b, H3c, H3d, H3e and H3f)[11] and the outcome quality primary dimension.

#### 3.2.1.4 Overall Perceived Service Quality

Service quality is viewed as a reflection of the three primary dimensions identified as interaction quality, physical environment quality and outcome quality (Lu et al., 2009; Brady & Cronin, 2001), by retail bank customers. Therefore, the following three hypotheses are formulated as:

H4: There is a significant positive relationship between the interaction quality primary dimension and retail bank customers' overall service quality perceptions.

H5: There is a significant positive relationship between the physical environment quality primary dimension and retail bank customers' overall service quality perceptions.

H6: There is a significant positive relationship between the outcome quality primary dimension and retail bank customers' overall service quality perceptions.

### 3.2.2 Hypotheses Relating to Research Objective 2

Although studies have been conducted to measure customers' perceptions of service quality in the banking industry (Hossain et al., 2014; Bahia & Nantel, 2000; Jun, Peterson, Zsidisin, & Daily, 1999; Marshall & Smith, 1999; Athanassopoulos, 1997; Newman & Cowling, 1996; Blanchard & Galloway, 1994; McDougall & Levesque, 1994), the comparative importance of the service quality dimensions are still under researched. Mixed results have been reported in the marketing literature for the primary dimensions. From among the three dimensions, outcome quality is most reported as having the strongest influence on service quality in various service settings, e.g., sport spectators (Clemes et al., 2011), accommodation (Clemes et al., 2010; Clemes et al., 2009), hairdressers and local telephone service subscribers (Pollack, 2009), and urgent transport (Martínez Caro & Martínez García, 2007). Outcome quality is followed by interaction quality in importance, as

[11] Note: in Figure 3.1, the subdimensions a, b, c, d, e, f are labelled WT, C, V, SP, R, SOD.

reported by Hossain et al. (2014) for retail banks, Clemes et al. (2014) for Chinese mobile communications, and Clemes et al. (2007) for university student satisfaction. Only one study, by Chow, Lau, Lo, Sha, and Yun, (2007) on the restaurant industry, reports that the physical environment quality has the strongest influence on service quality. To extend retail banks' perceptions of the level of importance of the primary dimensions and subdimensions, the following hypotheses are formulated as:

H7a: Customers will vary in their perceptions of the importance of each of the primary dimensions.

H7b: Customers will vary in their perceptions of the importance of each of the subdimensions.

### 3.2.3 Hypotheses Relating to Research Objective 3

Customers' perceptions of service quality have been proposed as positively influencing customer satisfaction (Clemes et al., 2014, 2013; Karatepe, 2011; Ladhari et al., 2011b; Beerli et al., 2004; Jamal & Naser, 2002; Lassar et al., 2000; Yavas, Bilgin & Shemwell, 1997); perceived value (Clemes et al., 2014, 2013; Gera, 2011; Korda & Snoj, 2010; Chen & Chen, 2010; Lu et al., 2009; Cronin et al., 2000; Zeithaml, 1988); corporate image (Clemes et al., 2014, 2013; Ladhari et al., 2011b; Chahal & Kumari, 2010; Hu et al., 2009; Lu et al., 2009; Aydin et al., 2005; Wang et al., 2003; Bloemer et al., 1998; Nguyen & LeBlanc, 1998); switching costs (Clemes et al., 2014; Chou & Lu, 2009; Meng & Elliot, 2009; Aydin et al., 2005); and behavioural intentions (Mason & Nassivera, 2013; Li et al., 2011; Alexandris et al., 2002; Cronin et al., 2000; Zeithaml, 1988). Indirect relationships between service quality and behavioural intentions through customer satisfaction have also been reported (Mosahab et al., 2010; Bei & Chiao, 2006; Ehigie, 2006; Lam & Burton, 2006; Caruana, 2002). Therefore, the following hypotheses are formulated as:

H8: Higher perceptions of service quality positively affect customer satisfaction.

H9: Higher perceptions of service quality positively affect customer perceived value.

H10a: Higher perceptions of service quality positively affect favourable behavioural intentions.

H10b: Higher perceptions of service quality positively indirectly affect favourable behavioural intentions through customer satisfaction.

H11: Higher perceptions of service quality positively affect perceived switching costs.

H12: Higher perceptions of service quality positively affect corporate image.

Customer perceived value is proposed as having a positive influence on both customer satisfaction (Roig et al., 2013; Gera, 2011; Korda & Snoj, 2010; Chen, 2008; Bontis et al., 2007; Gallarza & Gil Saura, 2006; Cronin et al., 2000; Oh, 1999) and behavioural intentions (Chen, 2008; Lewis & Soureli, 2006; Sirdeshmukh et al., 2002; Oh, 1999). Therefore, the following two hypotheses are formulated as:

H13: Higher customer perceived value will positively affect customer satisfaction.

H14: Higher customer perceived value will positively affect behavioural intentions.

Perceived switching costs are claimed to have a positive influence on behavioural intentions (Burnham et al., 2003; Anderson et al., 1994; Dick & Basu, 1994; Fornell, 1992). As switching costs increase, the level of customer loyalty also increases (de Matos et al., 2009; Beerli et al., 2004; Lee & Cunningham, 2001; Jones et al., 2000; Andreassen & Lindestad 1998; Dick & Basu, 1994). Therefore, the following hypothesis is formulated as:

H15: Higher perceived switching costs will positively affect behavioural intentions.

Many studies support a positive link between corporate image and behavioural intentions (Ladhari et al., 2011b; Fathollahzadeh et al., 2011; Lai et al., 2009; Aydin et al., 2005; Hart & Rosenberger, 2004; Hong & Goo, 2004; Johnson et al., 2001; Nguyen & Leblanc, 2001; Kandampully & Suhartanto, 2000; Andreassen & Lindestad, 1998) as well as customer satisfaction (Richard & Zhang, 2012; Lai et al., 2009; Palacio et al., 2002; Andreassen & Lindestad, 1998). However, limited studies have been done to justify these relationship links in a banking context, especially in Malaysia. Therefore, the following hypotheses are formulated as:

H16: Higher perceptions of corporate image will positively affect favourable behavioural intentions.

H17: Higher perceptions of corporate image will positively affect perceptions of customer satisfaction.

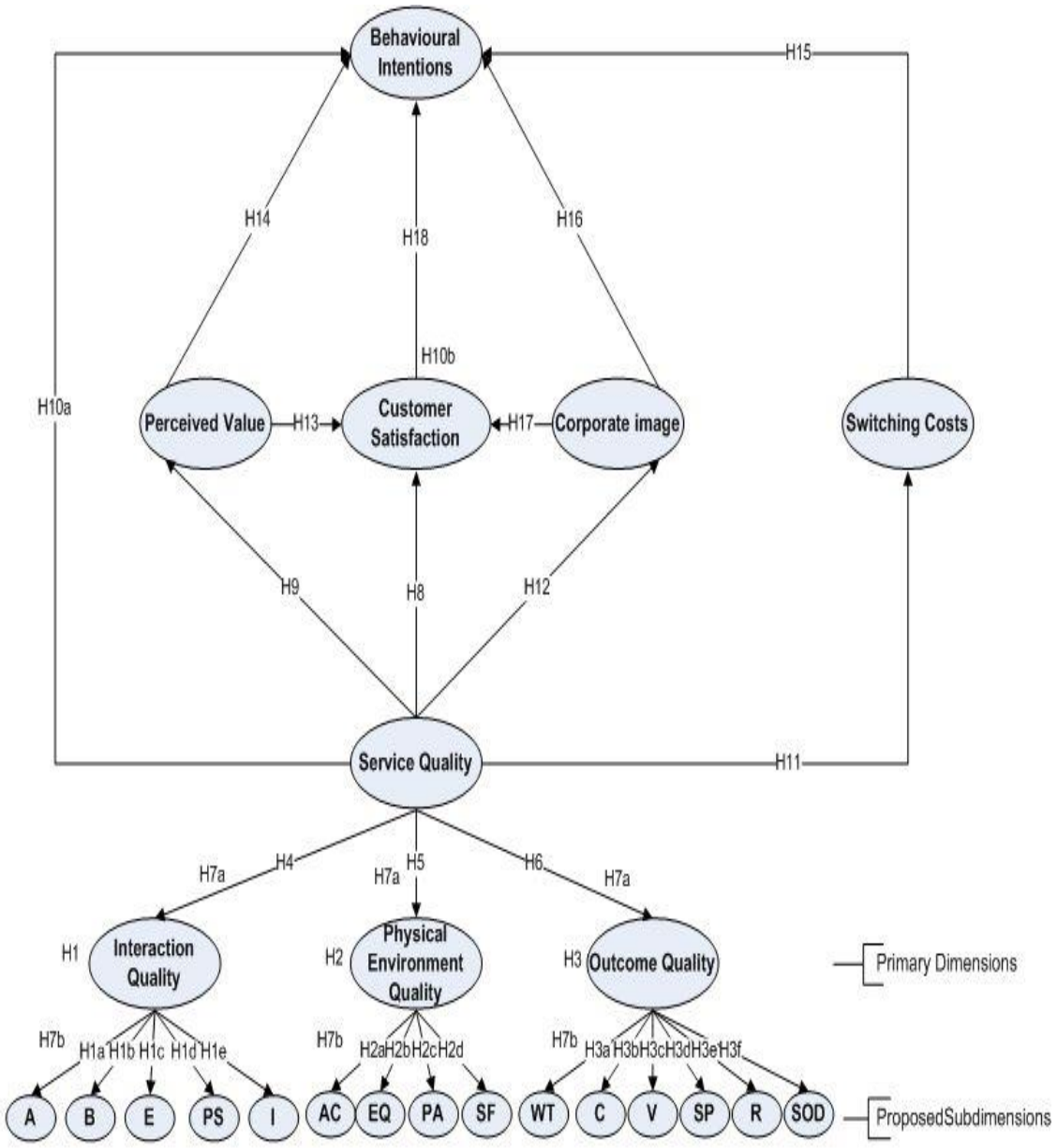
Finally, a considerable number of studies have confirmed a positive link between customer satisfaction and behavioural intentions in various industries, including banking, (Amin et al., 2013; Amin et al., 2011; Baumann, Burton, & Elliott, 2005; Beerli et al., 2004; Cronin & Taylor, 1992). Therefore, the following hypothesis is formulated as:

H18: Higher perceptions of customer satisfaction will positively affect customers' behavioural intentions.

### 3.3 Conceptual Research Model

The hierarchical model of behavioural intentions in the banking industry summarizes the hypotheses formulated in order to test each path in the model (see Figure 3.1).

**Figure 3.1: Behavioural Intentions in the Banking Industry: A Conceptual Research Model and Hypotheses**




Note: A= attitude, B= behaviour, E= expertise, PS= problem solving, I= information, AC= ambient conditions, EQ= equipment, PA= physical appeal, SF= social factors, WT= waiting time, C= convenience, V= valence, SP= security and privacy, R= reliability, SOD= speed of decisions and responses

# Chapter 4
# Research Design and Methodology

This chapter details the methodology used to empirically examine the conceptual model established in Chapter 3 and to address the research objectives discussed in Chapter 1. The research design, sampling method, data collection procedure and data analysis procedures are discussed in the following sections.

## 4.1 Research Design

This study uses a research-based survey after considering the research purpose, model, and hypotheses developed in Chapter 3. According to Zikmund, Babin, Carr, and Griffin, (2013), a survey is a research technique in which a sample population is interviewed in some form, or the behaviour of respondents is observed and described in some way. Surveys provide not only quick, inexpensive and efficient results, but also are an accurate means of assessing information about a population (Zikmund et al., 2013). A survey is categorised as a positivist approach; it involves a deductive process and is used primarily to generate quantitative data (Saunders et al., 2012; Quinlan, 2011; Collis & Hussey, 2009). The positivist approach is associated with quantitative research, namely the production and study of numbers and statistics (Quinlan, 2011). Several methods for collecting survey data are available to a positivist study, one of which is a questionnaire (Saunders et al., 2012; Collis & Hussey, 2009).

A questionnaire is a method for collecting primary data in which a sample of respondents is asked a list of structured questions that have been subjected to a pretest in order to obtain reliable responses (Collis & Hussey, 2009). Questionnaires have two main advantages: (1) they provide an efficient way of collecting responses from a large sample before quantitative analysis (Saunders et al., 2012); and (2) if the questionnaires are worded correctly, less skill and understanding is required to carry out a survey than when using semi-structured or in-depth interviews (Jankowicz, 2005). In fact, questionnaires are the most frequently used method of data collection in empirical research (Saunders et al., 2012) and are relatively popular in bank marketing (see Roig et al., 2013; Karatepe, 2011; Nadiri et al., 2009; Arasli et al., 2005; Wang et al., 2003; Bahia & Nantel, 2000; Bloemer et al., 1998). These considerations justify the use of the questionnaire as an effective data collection technique for this study and as a means to answer the three objectives stated in Chapter 1.

The questionnaire is designed and developed specifically for ascertaining Malaysian retail banking customers' behavioural intentions. In addition, a structured questionnaire is used in this study so all respondents are asked the same questions in the same order (Collis & Hussey, 2009).

### 4.1.1 Construct Operationalization

The most important thing to consider before designing a data collection instrument is the operationalization of the constructs (Davis & Cosenza 1993). Construct operationalization in this study follows the procedure suggested by Churchill (1979) because this procedure has been routinely applied in marketing and consumer behaviour research (Ko & Pastore, 2005; Brady & Cronin, 2001). Once the constructs were conceptually defined (see Chapter 2: Section 2.2), the next step was to generate a set of items for each construct in the conceptual research model. The main goal of item generation is to produce a set of items that fully capture all the essential aspects of the construct as well as minimizing the extent to which items tap concepts outside the domain of the construct (Kline et al., 2011; MacKenzie et al., 2011; Hair et al., 2010).

In this study, a pool of items for the questionnaire development were generated from various sources involving an extensive review of the literature and including previous theoretical and empirical research on the constructs (MacKenzie et al., 2011; Churchill, 1979). All items adopted to represent the constructs were modified to fit the retail banking services context. Based on the literature, three primary dimensions of service quality were identified for retail banking services: interaction quality, physical environment quality and outcome quality (i.e., Lu et al., 2009; Pollack, 2009; Brady & Cronin, 2001). Next, the potential items for measuring the proposed subdimensions of the three primary dimensions of service quality were generated from a literature review and grouped accordingly (see Appendix 1). However, in order to confirm the subdimensions that specifically suited a retail bank in Malaysia, focus groups were employed as encouraged by Churchill (1979) and supported by the comments of Cox, Higginbotham and Burton (1976, p. 79); "focus group interviews can also give direction and guidelines for constructing questionnaires". The focus group procedures applied in this study are discussed in detail in the following subsections.

### 4.1.2 Focus Group Procedure

Three focus groups were conducted for the study because the process can assist in defining and developing a questionnaire, thus generating reliable measurement scales

(Morgan, 1996). A focus group is a group discussion that focuses upon a particular issue or topic by encouraging discussion among participants and the sharing of perceptions in an open and tolerant environment (Krueger & Casey, 2009; Morgan, 1996). As discussed by Sekaran (2005), the main purpose of a focus group is to facilitate a discussion that allows the researcher to obtain the participants' perspectives in an open, free and relaxed setting. Also, participants can feed on each other's comments and develop ideas that would be difficult to express in a different interview format (Zikmund et al., 2013).

According to McLafferty (2004), focus groups have been used since 1926 as a strategy for understanding attitudes and opinions and they offer several advantages: (1) they are relatively fast; (2) they are easy to execute; (3) they allow respondents to piggyback off each other's ideas; (4) they are flexible enough to allow more detailed descriptions; and (5) they may encourage a greater spontaneity in the expression of views than alternative methods of data collection (see Threlfall, 1999; Goldman, 1962). Therefore, focus groups were used in this study to help confirm the subdimensions relating to the three primary dimensions of service quality: interaction quality, physical environment quality and outcome quality, based on the hierarchical service quality model introduced by Brady and Cronin (2001). The same process has been used by previous researchers when developing hierarchical service quality models related to the service under investigation (Clemes, 2014, 2010, 2009; Dagger et al., 2007; Martínez García & Martínez Caro, 2008, 2007; Brady & Cronin, 2001).

Once approval from the Lincoln University Human Ethics Committee (HEC) was received, the focus groups were formed and participants were selected from among Malaysian students studying at Lincoln University and the University of Canterbury, New Zealand. Zikmund et al. (2013) and Cox et al. (1976) suggest that the optimal number of focus group participants is eight to twelve, and that the groups should be as homogeneous as possible (Hair et al., 2000). The groups for this study were homogeneous in terms of the level of education i.e., undergraduate and postgraduate students (McLafferty, 2004). Eight participants, four males and four females, took part in every session conducted. The 24 participants involved were screened to ensure that they were 18 years or older and had been Malaysian retail bank customers during the previous six months.

The focus group sessions started with a brief explanation of the study by the researcher, who acted as the moderator. Following the method of Brady and Cronin (2001), the participants were encouraged to discuss and list all factors that influence their overall perception of service quality according to their previous banking experiences. Next, all participants were asked to place these factors (subdimensions) under each of the three

primary dimensions of service quality: interaction quality, physical environment quality and outcome quality. Finally, participants were asked to identify the most important factors under each of the primary dimensions. Consistent with Brady and Cronin (2001) and Dabholkar et al. (1996), price was eliminated from the list of factors being investigated, based on the argument that price is a determinant of service value (e.g., Bitner & Hubbert, 1994; Zeithaml, 1988) rather than service quality.

Each session lasted for approximately two hours. Factors identified in the focus groups were combined with the review of the relevant literature, to identify variables, to assist in item generation, and to suggest the dimensionality of service quality in retail banking. The focus group discussions provided valuable information for finalizing the research model as well as providing the basis for developing the measurement items of the subdimensions of service quality used in the questionnaire. The initial 82 service quality items were grouped under relevant subdimensions before being transformed into a questionnaire (see Table 4.1) (Clemes, 2014, 2011, 2010, 2009; Martínez García & Martínez Caro, 2008, 2007; Dagger et al., 2007; Brady & Cronin, 2001). The following subsection describes the detailed design of the questionnaire.

### 4.1.3 Questionnaire Design

Since this study has adopted a positivist approach, the closed-ended questionnaire format was chosen for obtaining the data (Fink, 2009). Closed-ended questions require the respondent to select the answer from a number of predetermined options, which usually means the questionnaire is quicker and easier to answer because it requires minimal writing (Saunders et al., 2012). Closed-ended questions usually result in a higher response rate than open-ended questions (Falthzik & Carroll, 1971). Moreover, closed-ended questions are also simpler to analyse because the range of potential answers is limited (Collis & Hussey, 2009).

To measure the conceptual constructs in this study, multi-item scales were employed (Churchill, 1979). Bergkvist and Rossiter (2007, p. 175) claim that "…ever since Churchill's 1979 article, academic researchers have increasingly used multiple item scales to measure every marketing construct". Multi-item scales are preferred over single-item scales because each construct (service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions) proposed in this study is complex. Complex constructs are difficult to summarize in a single question because more than one item is needed to fully represent the conceptual domain of the construct (Kline, 2011; MacKenzie et al., 2011; Hair et al., 2010; Churchill, 1979; Peter, 1979).

The adoption of structural equation modelling techniques in this study further encouraged the use of multi-item scales to ensure dimensionality, reliability and validity (e.g., Baumgartner & Homburg, 1996; Steenkamp & van Trijp, 1991; Anderson & Gerbing, 1982). A single-item scale is unattractive because it does not allow estimation of the internal consistency reliability of the measure (Nunnally, 1978), which creates a problem when using structural equation modelling (Hair et al., 2010; Baumgartner & Homburg, 1996). Subject to structural equation modelling guidelines, a minimum of three (preferably four) items per construct is considered good practice not only to provide minimum coverage of the construct's theoretical domain, but also to provide adequate identification of the construct (Kline, 2011; Hair et al., 2010; Schumacker & Lomax, 2004; Baumgartner & Homburg, 1996; Bollen, 1989; Anderson & Gerbing, 1988; Bentler & Bonett, 1980).

Multi-item scales are better for reducing the level of measurement error (Venkatraman & Grant, 1986), thus leading to increased reliability and the achievement of valid measurements of complex constructs (De Vellis, 2003; Nguyen & Leblanc, 2001; Churchill, 1979; Peter, 1979; Nunnally, 1978). Therefore, all the subdimensions and primary dimensions of service quality and other related constructs proposed in this study have been measured with multiple items.

In line with the multi-item scales employed in this study and in accordance with previous studies on; interaction quality, physical environment quality, outcome quality, service quality, customer satisfaction, perceived value, corporate image, customer switching costs, and behavioural intentions, a Likert-type scale was adopted for measuring the items (Clemes et al., 2014, 2009, 2007; Lu et al., 2009; Martinez Caro & García, 2008; Aydin et al., 2005; Beerli et al., 2004; Brady & Cronin, 2001; Andreassen & Lindestad, 1998). The Likert-scale was developed in 1932 and is now one of the most widely used scale (Leung, 2011). This is because the scale is useful for measuring opinions, preferences and the direction and strength of attitudes (Leung, 2011; Quinlan, 2011). The scale also offers a high likelihood of responses that accurately reflect the opinions of the respondents (Burns & Bush 2002; Zikmund 2000; Wong 1999). Further, the Likert-scale is easy to answer and therefore is less time-consuming for respondents (Frazer & Lawley, 2000; Churchill, 1995; McCelland, 1994).

This study employs a seven-point Likert-type scale ranging from "1=strongly disagree" to "7= strongly agree" (Lu et al., 2009; Dagger et al., 2007; Brady & Cronin, 2001; Babakus & Boller, 1992). Schall (2003) considers that the seven-point Likert-type scale is the optimum size compared with five- and ten-point Likert-type scales; reliability increases as the

number of points increase but levels off at seven points (Allen & Seaman 2007; Neuman, 2006). This scale is more effective than others (such as a five-point Likert-scale) because it allows greater discrimination and finer differences between people's views (De Vaus, 2002). For that reason, the seven-point Likert-type scale is widely used in market research and has been extensively tested in both marketing and social science (Garland, 1991). Besides the Likert-type scale, nominal and ordinal scales were also used to gather respondents' personal information: gender, age group, occupation, monthly income and length of time they had been with the bank.

Consistent with Cronin and Taylor (1994, 1992), the questionnaire used performance-only items to avoid the psychometric problems that are encountered using the expectation-perception disconfirmation approach designed by Parasuraman et al. (1988). A review of studies of service quality in banking found that the use of the expectation-perception disconfirmation approach had little support either theoretically or empirically (Babakus & Mangold, 1992; Cronin & Taylor, 1992). In fact, most service quality studies have used performance-based measures (Vera & Trujillo, 2013; Martinez García & Martinez Caro, 2010; Sachdev & Verma, 2004; Zeithaml et al., 1996; Cronin & Taylor, 1992) because the approach is simpler, more easily understood and ultimately more effective. The expectation-perception disconfirmation approach is both too time consuming and too complex for most respondents (Carman, 1990). Based on previous researchers' recommendations and findings, this study adopted performance-based measures and worded items in the questionnaire positively (Parasuraman et al., 1991; Carman, 1990). The next step is a discussion of measurement validity.

### 4.1.4 Measurement Validity

According to Quinlan (2011), the questionnaire must be a valid measure of the phenomenon under investigation. Valid measurement is achieved when the instrument truly measures the constructs that are meant to be measured (Peter, 1979). Bollen (1989, p. 184), treats validity as being "concerned with whether a variable measures what it is supposed to measure". Essentially, a good measure in research should have a high degree of validity (Zikmund et al., 2013; Churchill, 1979; Peter, 1979). To establish the validity of the measurement, three types of validity: face, content, and construct (convergent and discriminant) validity, are examined in this study. These relate to the internal validity of the scales and their respective items (Zikmund et al., 2013; Bagozzi, 1980; Schwab, 1980; Peter, 1981, 1979; Nunnally, 1978).

Initially, face validity and content validity tests were conducted to validate the accuracy of the measured items in the questionnaire. Face validity is achieved when an assessment of the test items logically reflects the concept being measured as judged and confirmed by one or more groups of experts (i.e., including academics and practitioners from the industry) (Zikmund et al., 2013; Quinlan, 2011). When selecting evaluators, it is important to ensure that they have sufficient intellectual ability to rate the correspondence between items and the theoretical definitions (MacKenzie at al., 2011).

Content validity concerns "the degree that a measure covers the domain of interest" and does not go beyond concept measuring (Zikmund et al., 2013, p. 304). A measurement instrument is said to display content validity when it provides an adequate representation of the concept that it is intended to measure (Churchill, 1979). There are two ways of assessing content validity: (1) through definition of the construct from the literature reviewed; and (2) by using a panel of experts to assess whether each measurement item in the questionnaire actually measures the theoretical definition of the construct (Saunders et al., 2012, p. 429). At this stage, experts have to be sure that the individual item represents the content domain of the construct, and the items as a set collectively represent the entire content domain of the construct (Zikmund, 2013).

Simultaneously, the clarity, conciseness, grammar, reading level, and redundancy of items were also checked by the experts, who also offered suggestions for new items. Items that are unclear or about which there are disagreements between expert reviewers, should either be discarded or rewritten (Noar, 2003). Researchers are encouraged to develop items that are clear, concise and as specific as possible to define the constructs (Peterson, 2000) given that good construct definition is the most critical element in validation measurement (MacKenzie et al., 2011).

Even though content validity develops 'internally consistent' sets of measurement items, this is still insufficient for measurement validity (Nunnally, 1978). Therefore, this study examined construct validity to ascertain the correct, adequate operational measures for the concept being tested (Malhotra, 2004). In order to establish construct validity, two components of construct validity were analysed: (1) convergent validity and (2) discriminant validity. Hair et al. (2010, p. 678) define convergent validity as being "the items that are indicators of a specific construct that should converge or share a high proportion of variance in common", while discriminant validity "is the extent to which a construct is truly distinct from other constructs". There are numerous ways to estimate convergent and discriminant validity among measurement items using a quantitative method (Churchill, 1979).

Specifically, in this study, confirmatory factor analysis (CFA) was used to estimate both convergent and discriminant validity (Kline, 2011; Hair et al., 2010). They are discussed in detail in Subsection 4.3.4.7.

### 4.1.5 Pre-Testing Procedures

Before the survey, a pre-test (pilot study) was conducted. The reason for pre-testing was to receive feedback from Malaysian retail bank customers and experts in the industry. A pre-test helps to refine the questionnaire through the feedback with regard to question wording, question order, redundant questions, missing or inappropriate questions, confusing response categories and poor scale items (Saunders et al., 2012; Randall & Gibson, 1990). Therefore, respondents in the pre-test were encouraged to comment about any questions they considered ambiguous or difficult to answer. The pre-test served mainly to increase the reliability and validity of the measurements, the sequences and the relevance of the questionnaire to this study (Saunders et al., 2012; Cooper & Schindler, 2006).

Following Clemes et al. (2011) and Ko and Pastore's (2005) recommendations, the pre-test was performed in two stages. Stage one involved a panel of experts screening the questionnaire to verify face and content validity (Zikmund et al., 2013). An expert panel of four bank managers and four academics reviewed the items, in particular to assess for relevance, readability, similarity, and ambiguity (De Vellis, 2003; Rossiter, 2002). Several amendments to the questionnaire were made based on their comments and suggestions, thus increasing face and content validity (see Section 4.1.4) (Noar, 2003). The initial pool of items defining constructs was thus finalized for the next stage of the pre-test procedure.

In the second stage, the pre-final draft of the questionnaire was field-tested in Malaysia using a convenience sample of 50 Malaysian retail bank customers to ensure the clarity, usability and reliability of the measurement (Hume & Mort, 2010). Luckas et al. (2004) point out that 50 respondents is ideal for running proper statistical testing procedures. The respondents were over 18 years old and had used bank services for at least the last three months. All the respondents completed a pre-final draft of the questionnaire and were encouraged to give feedback in terms of time taken, clarity and the wording of the items. This is important because clear wording of items using terms familiar to and understood by the respondents can improve a questionnaire's validity (Fink, 2009).

Next, Cronbach's alpha test was performed to test the reliability and internal consistency of each of the items used to measure the constructs in the questionnaire. No reliability alpha was below the threshold point of 0.60, demonstrating internal consistency

(Nunnally & Bernstein, 1994; Churchill, 1979; Nunnally, 1978). Minor modifications to the scales were made (i.e., duplicate or redundant statements were removed) to ensure that the questionnaire would be effective for data collection and would achieve the study's research objectives (see Section 1.4). The final layout of the questionnaire is given in the next subsection.

### 4.1.6 Final Layout of the Questionnaire

According to Saunders et al. (2012), response rates can be improved by careful attention to a questionnaire's appearance, length, content and delivery method, as well as it being clearly worded and well laid out. For this reason, several modifications were made to the questionnaire based on the banking experts' recommendations and the respondents' feedback during the pre-test stage (see Section 4.1.5). The questionnaire was revised to make sure the wording of items and content was clear, concise, readable, distinct, and that they reflected the scale's purpose (i.e., to produce responses that could be scored in a meaningful way in relation to the construct definition).

As shown in Appendix 1, the final questionnaire was divided into five sections and was constructed using a "structured questionnaire format" (Armitage & Conner, 1999). Sections A to C asked respondents to rate their perceptions of bank service quality primary dimensions: interaction quality, physical environment quality, and outcome quality constructs (Brady & Cronin, 2001). Section D sought to obtain information about the respondents' perceptions of bank service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions. Section E, the final section, was designed to obtain socio-demographic profiles and information on the respondents' banking behaviour.

In total, 126 items were retained in the questionnaire after deleting 12 items from the initial pool of 138 items. The decision to remove these items was based on the pre-test results. The final items used in the questionnaire are reported in the following subsection. A covering letter was attached to the questionnaire (see Appendix 1) to briefly explain the aim and purpose of the study and to assure respondent's of confidentiality, as well as providing the contact details of the researcher and supervisor (Saunders et al., 2012; Collis & Hussey, 2009).

#### 4.1.6.1 Section A

Section A covering interaction quality consists of five subdimensions: attitude, behaviour, expertise, problem solving, and information. A total of 33 items measured

interaction quality[12]. As presented in Table 4.1, five items measured attitude, six items measured behaviour, six items measured expertise, five items measured problem solving, seven items measured information, and four items measured customers' overall perceptions of interaction quality.

**Table 4.1: Questionnaire Items for Measuring Interaction Quality**

| | Item Number | Description/Scale Item |
|---|---|---|
| Attitude (5 items) | Aatt1 | The employees of the XYZ Bank are friendly. |
| | Aatt2 | The employees of the XYZ Bank are patient. |
| | Aatt3 | The employees of the XYZ Bank are willing to help me. |
| | Aatt4 | The employees of the XYZ Bank are consistently courteous. |
| | Aatt5 | The employees of the XYZ Bank have a positive attitude towards customer service. |
| Behaviour (6 items) | Abe1 | The employees of the XYZ Bank greet me when it's my turn to be served. |
| | Abe2 | The employees of the XYZ Bank give personal attention to me. |
| | Abe3 | The XYZ Bank has employees who deal with customers in a caring manner. |
| | Abe4 | The XYZ Bank employees understand my specific needs. |
| | Abe5 | The behaviour of employees in the XYZ Bank instils confidence in me. |
| | Abe6 | The XYZ Bank employees do not hesitate to find the time to serve me better. |
| Expertise (6 items) | Aex1 | The employees of the XYZ Bank have adequate knowledge about the bank's services and products. |
| | Aex2 | The employees of the XYZ Bank are knowledgeable when answering my questions. |
| | Aex3 | The XYZ Bank employees have the necessary knowledge to serve me promptly. |
| | Aex4 | The employees of the XYZ Bank give clear and precise answers to my enquiries. |
| | Aex5 | The XYZ bank has competent employees who demonstrate the necessary banking skills. |
| | Aex6 | The employees of the XYZ Bank are efficient in handling my transactions. |
| Problem Solving (5 items) | Aprb1 | The employees of the XYZ Bank have the ability to solve a problem. |
| | Aprb2 | The employees of the XYZ Bank have shown an interest in solving problems. |
| | Aprb3 | The employees of the XYZ Bank are dependable in handling customer service problems. |
| | Aprb4 | The employees of the XYZ Bank have the ability to openly discuss solutions when problems arise. |
| | Aprb5 | I do not have to visit the XYZ Bank many times to solve a particular problem. |

[12] See Appendix 2 for items references

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|---|---|---|
| Information (7 items) | Ainfo1 | The employees of the XYZ Bank keep me informed about matters of concern to me. |
| | Ainfo2 | The employees of the XYZ Bank keep the client informed every time a better solution appears to a problem. |
| | Ainfo3 | The employees of the XYZ Bank always provide clear information. |
| | Ainfo4 | The employees of the XYZ Bank always provide accurate information. |
| | Ainfo5 | The employees of the XYZ Bank explain their services and fees fully to the customer. |
| | Ainfo6 | The XYZ Bank provides information when there is a new banking service. |
| | Ainfo7 | The employees of the XYZ Bank continuously provide me with progress information when I apply for a service that needs time to be completed. |
| Interaction Quality (4 items) | Aall1 | The employees of the XYZ Bank deliver a superior service. |
| | Aall2 | The employees of the XYZ Bank consistently provide quality services. |
| | Aall3 | The level at which the employees of the XYZ Bank understand my needs is very good. |
| | Aall4 | Overall, I'd say the quality of my interaction with the XYZ Bank's employees is excellent. |

#### 4.1.6.2 Section B

Section B consists of 25 items for measuring the second primary dimension of bank service quality; physical environment quality, which comprises four subdimensions. As presented in Table 4.2, five items measured ambient conditions, six items measured equipment, six items measured physical appeal, four items measured social factors and four items measured customers' overall perceptions of the quality of the physical environment.

**Table 4.2: Questionnaire Items for Measuring Physical Environment Quality**

| | Item Number | Description/Scale Item |
|---|---|---|
| Ambient Conditions (5 Items) | Bam1 | Space in the XYZ Bank is adequate. |
| | Bam2 | The XYZ Bank looks attractive from the outside. |
| | Bam3 | The temperature in the XYZ Bank is comfortable. |
| | Bam4 | The noise level in the XYZ Bank is reasonable. |
| | Bam5 | I believe that the XYZ Bank provides a comfortable environment in which to do business. |
| Equipment (6 items) | Beq1 | The XYZ Bank has modern looking equipment. |
| | Beq2 | The XYZ Bank has up to date equipment. |
| | Beq3 | The XYZ Bank employs the latest technology in banking. |
| | Beq4 | The XYZ Bank's ATM is easily accessible. |
| | Beq5 | The XYZ Bank's ATM is easy to operate. |
| | Beq6 | The XYZ Bank's ATM is always working. |
| Physical Appeal (6 items) | Bphy1 | The XYZ Bank's physical facilities are attractive. |
| | Bphy2 | The XYZ Bank's physical facilities are comfortable. |
| | Bphy3 | The XYZ Bank has a superb layout and furniture arrangement. |

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| | Bphy4 | The XYZ Bank's interior design (furnishing) gives me the appearance of a quality branch. |
| | Bphy5 | Material associated with the service (such as pamphlets or statements) are visually appealing at the XYZ Bank. |
| | Bphy6 | The employees of the XYZ Bank are well dressed and neat in appearance. |
| Social Factors (4 Items) | Bsoc1 | The attitudes of other customers do not disturb me in the XYZ Bank. |
| | Bsoc2 | The behaviour of other customers does not disturb me in the XYZ Bank. |
| | Bsoc3 | I am not disturbed when other customers interact with the employees in the XYZ Bank. |
| | Bsoc4 | The presence of other customers of the XYZ Bank does not affect its ability to provide me with good service. |
| Physical Environment Quality (4 Items) | Ball1 | I feel comfortable in the physical environment of the XYZ Bank. |
| | Ball2 | I would rate the XYZ Bank's physical environment highly. |
| | Ball3 | I think that XYZ Bank's physical environment is one of the best in the industry. |
| | Ball4 | Overall, the physical environment of the XYZ Bank is excellent. |

#### 4.1.6.3 Section C

Section C investigates outcome quality, the third dimension of bank service quality, by measuring six subdimensions: waiting time, convenience, valence, security and privacy, reliability, and speed of decisions and responses. Table 4.3 shows five items for measuring waiting time, six for measuring convenience, three for measuring valence, seven for measuring security and privacy, six for measuring reliability, five for measuring speed of decisions and responses, and three for measuring customers' overall perceptions of outcome quality. In total, 35 items were used for measuring outcome quality

**Table 4.3: Questionnaire Items for Measuring Outcome Quality**

| | Item Number | Description/Scale Item |
|---|---|---|
| Waiting Time (5 Items) | Cwa1 | I find queues in the XYZ Bank move rapidly. |
| | Cwa2 | I do not have to wait long to be served in the XYZ Bank. |
| | Cwa3 | I am able to conduct a transaction immediately or after a short waiting period in the XYZ Bank. |
| | Cwa4 | There are no long queues in front of ATMs at the XYZ Bank. |
| | Cwa5 | The XYZ Bank provides the service at the time the service was promised. |
| Convenience (6 Items) | Cco1 | The XYZ Bank offers sufficient and convenient operating hours. |
| | Cco2 | I find the XYZ Bank has convenient branch locations. |
| | Cco3 | It is easy to find the XYZ Bank ATMs in places other than its branches. |
| | Cco4 | I find a variety of transactions can be performed at the XYZ Bank ATMs. |
| | Cco5 | I find clear guidance and information on signs on how to use the XYZ Banks' services and facilities. |
| | Cco6 | The XYZ Bank offers alternative channels for transactions (e.g. e-banking, internet banking, and phone-banking). |
| Valence (3 Items) | Cval1 | When I leave the XYZ Bank, I usually feel I have had a good experience. |
| | Cval2 | I believe the XYZ Bank tries to give me a good experience. |
| | Cval3 | I believe the XYZ Bank knows the type of experience its customers want. |
| Security and Privacy (7 Items) | Csec1 | I feel safe at the XYZ Banks' ATM site. |
| | Csec2 | I feel safe inside the XYZ Bank. |
| | Csec3 | The employees of the XYZ Bank respect the privacy of my financial affairs when I am standing at the counter. |
| | Csec4 | I feel secure in my dealings with the employees of the XYZ Bank. |
| | Csec5 | I find all transactions in the XYZ Bank are confidential. |
| | Csec6 | I believe the XYZ Bank is a bank that is worth trusting. |
| | Csec7 | The XYZ Bank offers privacy in problem solving situations. |
| Reliability (6 Items) | Crel1 | I find an absence of errors in the service delivered by the XYZ Bank. |
| | Crel2 | The XYZ Bank performs the service right the first time. |
| | Crel3 | The XYZ Bank performs the service accurately. |
| | Crel4 | When the XYZ Bank promises to do something by a certain time it does so. |
| | Crel5 | The XYZ Bank guarantees a reliable service. |
| | Crel6 | The XYZ Bank employees are always available for service. |
| Speed of Decisions and Responses (5 Items) | Csp1 | The XYZ Bank responds efficiently to customer feedback. |
| | Csp2 | The XYZ Bank is responsive to my requests. |
| | Csp3 | The XYZ Bank offers a fast and efficient service. |

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| | Csp4 | The employees of the XYZ Bank give a prompt service. |
| | Csp5 | The employees of the XYZ Bank are efficient in handling complaints. |
| Outcome Quality (3 Items) | Call1 | It is always a good experience to use the services of the XYZ Bank. |
| | Call2 | I feel good about what the XYZ Bank provides to its customers. |
| | Call3 | Overall, I achieve the desired outcome when using the services of the XYZ Bank. |

#### 4.1.6.4 Section D

Section D consists of 33 items for measuring customers' overall perceptions of service quality, customer satisfaction, customer perceived value, corporate image, switching costs, and behavioural intentions. Table 4.4 shows five items for measuring customers' overall perceptions of service quality, five items for measuring customer satisfaction, five items for measuring customer perceived value, five items for measuring corporate image, six items for measuring switching costs and seven items for measuring behavioural intentions.

**Table 4.4: Questionnaire Items for Measuring Six Higher-Order Constructs**

| | Item Number | Description/Scale Item |
|---|---|---|
| Service Quality (5 Items) | Dsq1 | I believe that the XYZ Bank provides superior services in every way. |
| | Dsq2 | The quality of the service provided at the XYZ Bank is of a high standard. |
| | Dsq3 | The quality of the service provided at the XYZ Bank is impressive. |
| | Dsq4 | The XYZ Bank consistently provides high quality products. |
| | Dsq5 | Overall, the service quality of the XYZ Bank is excellent. |
| Customer Satisfaction (5 Items) | Dcs1 | My choice to be a customer of the XYZ Bank is a wise one. |
| | Dcs2 | I believe that purchasing services from the XYZ Bank is usually a satisfying experience. |
| | Dcs3 | I am pleased with what the XYZ Bank does for me. |
| | Dcs4 | I feel delighted with the services and products delivered by the XYZ Bank. |
| | Dcs5 | Overall, the XYZ Bank provides a very satisfying experience. |
| Perceived Value (5 Items) | Dpv1 | The XYZ Bank offers the best loan interest rates. |
| | Dpv2 | The XYZ Bank offers the best deposit interest rates. |
| | Dpv3 | The XYZ Bank charges reasonable service fees and commissions. |
| | Dpv4 | The services I receive from the XYZ Bank provide value for money. |
| | Dpv5 | Overall, I feel the XYZ Bank services and products are valuable. |

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|---|---|---|
| Corporate Image (5 Items) | Dci1 | The XYZ Bank has a good reputation. |
| | Dci2 | The XYZ Bank has a better image than its competitors. |
| | Dci3 | The XYZ Bank contributes to society. |
| | Dci4 | In my opinion, the XYZ Bank has a good image in the minds of consumers. |
| | Dci5 | Overall, I have a good impression of the XYZ Bank. |
| Switching Costs (6 Items) | Dsc1 | To change to another bank involves investing time in searching for information about other banks. |
| | Dsc2 | To change to another bank involves much effort in deciding which other bank to use. |
| | Dsc3 | To change to another bank involves a risk as another bank might not satisfy me. |
| | Dsc4 | I will have difficulties familiarising myself with the procedures of a new bank. |
| | Dsc5 | I think that changing from one bank to another is too much of a bother. |
| | Dsc6 | Overall, it is not worthwhile to switch to a new retail bank provider. |
| Behavioural Intentions (7 Items) | Dbi1 | I will say positive things about the XYZ Bank to other people. |
| | Dbi2 | I would always recommend the XYZ Bank to someone who seeks my advice on banking. |
| | Dbi3 | I would encourage friends and acquaintances to do business with the XYZ Bank. |
| | Dbi4 | I would consider the XYZ Bank as my primary bank. |
| | Dbi5 | I intend to continue doing business with the XYZ Bank. |
| | Dbi6 | I intend to do more business with the XYZ Bank in the next few years. |
| | Dbi7 | Overall, given the other choices of retail banking service providers, I will remain as a customer of the XYZ Bank. |

#### 4.1.6.5 Section E

Section E (See Appendix 1) includes five items for gathering socio-demographic information regarding gender, age, occupation, and monthly income. In addition, information regarding the length of time that customers have been with their bank was also gathered.

### 4.1.7 Reliability of the Measurement

Reliability and validity tests of the measurement scales are necessary in this study because multi-item scales are used to measure the constructs (Peter, 1979). Reliability is concerned with the ability of a measure to generate consistent results of what it is measuring, due to the degree to which measures are free from error (Zikmund et al., 2013; Schumacker & Lomax, 2004; Peter, 1979; Nunnally, 1978). Reliability is an indicator of a measure's internal consistency; each indicator of a concept converges on some common meaning (Zikmund et al., 2013). They are methods for estimating internal consistency; one of the most

frequently used is Cronbach's coefficient alpha (Saunders et al., 2012; Kline, 2011; Nunnally, 1978; Cronbach, 1951). Cronbach's coefficient alpha helps to examine a multiple-item scale's reliability, as well as confirming the quality of the instrument (Zikmund et al., 2013; Kline, 2011; Churchill, 1979). The rule of thumb is that a Cronbach's coefficient alpha of between 0.80 and 0.95 is considered to show very good reliability; scales with an alpha of between 0.70 and 0.80 have good reliability and values between 0.60 and 0.70 indicate fair reliability (Zikmund et al., 2013, p. 302). Overall, a coefficient alpha of 0.70 or higher is generally acceptable (Nunnally & Bernstein, 1994) because it indicates that the questions combined in the scale are measuring the same thing (Saunders et al., 2012).

Besides the Cronbach's coefficient alpha, the most rigorous approach for estimating the reliability of a construct measurement through its indicators is to use confirmatory factor analysis (CFA) (Kline, 2011; Jöreskog & Sörbom, 1981). In CFA, the reliability of the construct is assessed by using the construct reliability (CR), also known as composite reliability (Hair et al., 2010; Schumacker & Lomax, 2004). A CR of 0.70 or higher is generally acceptable (Nunnally, 1978). Although the analysis for each reliability test is undertaken after data collection, the tests also need to be considered at the questionnaire design stage (Saunders et al., 2012). Therefore, Cronbach's coefficient alpha was used earlier in the pre-testing stage (see Subsection 4.1.5).

## 4.2 Sampling Method and Data Collection Procedure

### 4.2.1 Sample Size

McQuitty (2004) suggests that before data collection, it is important to determine the minimum sample size required to achieve the desired level of statistical power within a given model. In this study, two analysis techniques are used: Exploratory Factor Analysis (EFA) and Structural Equation Modelling (SEM). Therefore, the estimated sample size in this study corresponds to the requirements of the two techniques.

For EFA, studies have found that in most cases, it requires a minimum sample size ranging from 100-500 observations (Hair et al., 2010; Pallant, 2007; Comfrey & Lee, 1992; Gorsuch, 1983). Experts also recommend that the minimum item-to-response ratio range of 3:1 to 10:1 for each set of scales be factor analysed (Cattell, 1978; Everitt, 1975). A few researchers claim that any ratio less than a minimum of three participants per item are generally inadequate (Thompson, 2004; Reise, Waller, & Comrey, 2000; Velicer & Fava, 1998). In this study, since the potential observations identified for the proposed

subdimensions are 88 items, the minimum item-to-response ratio is 264:1. Therefore, the sample needs to consist of at least 264 respondents. However, other researchers have argued that item-to-response ratio guidelines are not sufficiently sensitive to a variety of important characteristics of the data (MacCallum et al., 1999; Velicer & Fava, 1998).

The primary limitation of such guidelines is that an adequate sample size is not a function of the number of measured variables per se but is instead, influenced by the extent to which factors are over-determined and the level of the communalities of the measured variables (MacCallum et al., 1999). As an alternative to item-to-response ratios, this study considers the number of items per factor and item communalities, since evidence demonstrates they are the most important determinants of an adequate sample size for EFA (Guadagnoli & Velicer, 1988).

Based on these guidelines, when the factors are strongly determined (i.e., at least three or four measured items for each factor) and the communalities are high (i.e., an average of 0.70 or higher), accurate estimates of population parameters can be obtained with samples as small as 100 (MacCallum et al., 1999). However, under moderate conditions of communalities (i.e., 0.40 to 0.70) and moderate over-determination of factors, a sample size of at least 200 or more seems advisable (Fabrigar et al., 1999; MacCallum et al., 1999). Conversely, larger sample sizes (e.g., 300 to 500) are required when communalities are low and the factors are weakly determined. Following the suggestions, a sample size of 240 for EFA was set for this study. The sample size of 240 is likely to be adequate because data sets for this study contain communalities higher than 0.50 (Worthington & Whittaker, 2006). Additionally, the factors are strongly determined with at least three measured items for each factor (Fabrigar et al., 1999; MacCallum et al., 1999).

Although there is little consensus on the recommended sample size for SEM, as a rule of thumb, a few researchers suggest a minimum sample size of 200, merely to ensure the appropriate use of Maximum Likelihood Estimation (MLE) in the analysis (Kline, 2011; Hair et al., 2010; Boomsma & Hoogland, 2001; Garver & Mentzer, 1999; Kelloway, 1998; Bollen, 1989; Boomsma, 1982). According to Hoe (2008), any number above 200 provides sufficient statistical power for data analysis, as well as reducing biases in parameter estimates to an acceptable level for any type of SEM estimation (Boomsma & Hoogland, 2001; Kline, 1998).

Although SEM is a large sample technique (Kline, 2005, p. 111), a sample size of 400 and over is considered undesirable because the methods become “too sensitive” as almost any difference is detected, which leads to poor goodness-of-fit (Hair et al., 1998; 1992; Tanaka, 1987; Carmines & McIver, 1981). Accordingly, the ideal sample size for SEM in this study is

between 200 and 400 observations. Considering the requirements of EFA and SEM, the minimum sample size set for this study is therefore at least 440 observations.

### 4.2.2 Sample Derivation

All retail bank customers who purchase products or services using traditional banking (bank branches) are the population for this study. The customers of two retail banks, Malayan Banking Berhad (Maybank) and the Public Bank Berhad (Public Bank) are the main target for the sample. These banks were chosen because they are categorized as two of the major local banks in the Malaysian retail banking sector.

Established in 1960 as a government-linked corporation, Maybank has the largest asset base in Malaysia, consisting of MYR560 billion, with total deposits of MYR396 billion, and total loans of MYR356 billion[13].

The Public Bank, established in 1966, is the largest non-government-linked corporation in Malaysia by market capitalisation[14]. Relative to assets, the bank ranks as the third largest banking group in Malaysia with total assets of MYR305.73 billion[15], total deposits of MYR247.3 billion, and total loans of MYR215.6 billion[16].

The Public Bank is regarded as the closest competitor to Maybank. Both banks engage in all principal aspects of business banking and offer a comprehensive and innovative range of financial services and products including commercial banking, investment banking, Islamic banking, offshore banking, leasing and hire purchase, insurance, factoring, trustee services, asset management, stock broking, nominee services, venture capital, internet banking and mobile banking services.

Throughout the years, both banks have received numerous local and international awards for their great performance and excellent service, as well as for leadership, innovation, technology and corporate responsibility to the community[17].

Accessibility and the availability of branches are also major decision factors in selecting these two banks. Maybank has the largest banking network in Malaysia with 401 branches and 2,910 automatic teller and cash deposit machines scattered all over the country[18]. The Public Bank has 252 branches supported by 529 automatic teller machines,

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[13] As at 31 December 2013: www.maybank.com/en/investor-relations/investing-in-maybank/why-invest.page
[14] www.pbebank.com/corporate/
[15] As at the end of 2013: https://www.pbebank.com/corporate/index.html
[16] As at September 2013: http://www.freemalaysiatoday.com/category/business/2013/10/23/public-bank-net-profit-rises-6-8-to-rm3b/
[17] http://www.maybank.com/en/about-us/who-we-are/awards-recognition.page; www.pbebank.com/corporate/
[18] www.maybank.com/en/investor-relations/investing-in-maybank/why-invest.page

506 cheque deposit machines and 496 cash deposit terminals[19]. The banks are reported to serve the financial needs of over 17 million retail customers from all walks of life in Malaysia[20].

The sample unit consists of bank customers who are residents of major cities around the Klang Valley, particularly Kuala Lumpur and Shah Alam, the capital of the Selangor State. Klang Valley is Malaysia's most highly developed and fastest growing metropolitan region, with regard to population and to the economy. Including Kuala Lumpur city, its suburbs and adjoining towns in the State of Selangor, Klang Valley is the most populous area in Malaysia, currently home to about 7.2 million people out of 29 million, Malaysia's total population[21]. All banking activities are centred there due to its economic position as well as due to the status of Kuala Lumpur; the capital city of Malaysia. The residents of Klang Valley also have access to all types of banking channels including traditional banking, i.e., branch banking. In Kuala Lumpur itself, Maybank has 63 branches and a further 90 branches in Selangor, considered to be the highest bank branch density in Malaysia. Public Bank has 39 branches in Kuala Lumpur and 51 branches in Selangor. Additionally in this area, there is high competition between commercial banks and other financial institutions, and therefore increasing customer loyalty is essential for maintaining the business. Hence, Klang Valley contains a good representation of retail bank customers for evaluating the service quality offered by banks (Kumar et al., 2009).

### 4.2.3 The Data Collection Method and Procedure

A survey was conducted to test the hypotheses listed (see Section 3.2) because a survey is regarded as the most appropriate method for testing, where the research is based on factors such as: type of population, sampling, question form, question content, response rate, costs, and duration of data collection (Aaker, Day, Kumar, & Lawley, 2005). Survey-based methods can assemble a large sample of data quickly and efficiently (Hair et al., 2010; Zikmund & Babin, 2007; Sekaran, 2005; Kumar et al., 1999). Accordingly, a self-administered questionnaire survey (see Section 4.2.3.3) was adopted for this research with respondents taking responsibility for reading and answering the questions (Zikmund et al., 2013). The questionnaires were administered using the mall-intercept approach based on

[19]http://www.pbebank.com/corporate/
[20]http://biz.thestar.com.my/news/story.asp?file=/2012/11/29/business/12384449&sec=businesshttp://www.pbebank.com/corporate/
[21]http://thestar.com.my/news/story.asp?file=/2013/1/2/nation/12522345&sec=nation& http://www.statistics.gov.my/portal/index.php?lang=en

convenience sampling. Briefly, the procedures used for data collection in this study are: (1) the mall-intercept approach; (2) convenience sampling; and (3) self-administered. Each of these steps is described in the following subsections.

#### 4.2.3.1 The Mall-Intercept Approach

The mall-intercept approach produces better quality data, as according to Bush and Hair (1985, p. 165) "more accurate or less distorted responses appear to be obtained in the mall-intercept method". The approach not only can provide complete or in-depth responses but is also known as a useful method for studies seeking information on forms of desirable and/or undesirable behaviour (Bush & Hair, 1985). In fact, the approach has become increasingly popular and is heavily used by marketing researchers for data collection (Al-Hawari, 2011; Clemes, Gan & Zhang, 2010; Hume & Mort, 2010; Grace & O'Cass, 2004).

Several advantages are offered by this approach: (1) the convenience of using a central location frequented by large numbers of the target population; (2) an inexpensive way to collect data since no travel is required to the respondent's home, the respondent comes to the interviewer; (3) it is a relatively fast way to collect the data; and (4) it generates a higher response rate (Zikmund et al., 2013; Bush & Hair, 1985). However, it can be very time consuming if a wide geographic region is involved. Therefore, data collection for this research is restricted to the largest and the most densely populated metropolitan area in Malaysia, which is Klang Valley.

After considering all the above and due to the retail banking nature of the study (Handelman & Arnold, 1999), the mall-intercept approach was deemed appropriate for this study (Dabholkar et al., 1996). The questionnaire was administered at major shopping malls in the Klang Valley (i.e., KLCC, Mid Valley, SOGO, One Utama, Sunway Pyramid, Plaza Masalam). The shopping malls selected are high profile, high traffic shopping complexes with a few malls having a bank branch operating inside the mall (Grace & O'Cass, 2004). Questionnaires were administered to respondents in the malls' rest areas as well as areas near the bank branches, from 11.00 a.m. to 7.00 p.m. daily over a period of four weeks (1-31 October, 2011).

The location where the questionnaires were administered, the time of day (i.e., morning, noon and evening) and the days of the week, were rotated in accordance with the recommendations of Bush and Hair (1985), to make the final sample as representative as possible of the target population who shop at these particular shopping malls (Wong & Sohal, 2002). Additionally, different locations and times of day were used in this study mainly to

reduce sampling bias in the mall-intercept approach based on convenience sampling (see Section 4.2.3.2) (Grace & O'Cass, 2004; Wong & Sohal, 2002).

Data collection involved the researcher first approaching every third person to pass by the research spot, to determine if they qualified for the sample. The respondents had to be over age 18, who had experience with one of the bank brands (Maybank or Public Bank) and who had held an account with the particular bank for at least the last three months. If a respondent did not meet these conditions during the initial screening, then the survey was not carried out. Upon approaching the customer, the researcher and research assistant identified themselves, gave a brief introduction to the study as well as an assurance of respondent confidentiality and anonymity before requesting his or her participation.

Participation in the survey was voluntary and participants were assured that information provided would be kept private and confidential. Interested participants were invited to fill out the questionnaire and immediately return the completed questionnaire to the researcher or research assistant. The participants were also informed of further assistance available from the researcher for the clarification of questions (Wong & Sohal, 2002). A small gift (i.e., a pen) was provided as a gesture of appreciation for their participation.

#### 4.2.3.2 Convenience Sampling

A convenience sampling technique was utilised in this study because this technique is easily accessible, and requires little effort and time (Zikmund & Babin, 2007). According to Creswell (2008, p. 155), convenience sampling is appropriate when "the researcher selects participants because they are willing and available to be studied". This is consistent with the approach used in this study (see Section 4.2.3.1) where participation by respondents in the survey was completely voluntary. The mall-intercept approach discussed in Section 4.2.3.1 is simply a classic example of convenience sampling (Mallett, 2006). Convenience-sampling is one form of non-probability sampling (Zikmund et al., 2013) and has been used in many studies, particularly in bank marketing (i.e., Narteh, 2013a, b; Vera & Trujillo, 2013; Ladhari et al., 2011b; Jamal & Anastasiadou, 2009).

In non-probability sampling, the probability of any particular member of the population being chosen is unknown (Zikmund et al., 2013). The selection of sampling units in non-probability sampling is quite arbitrary. Unlike probability sampling, non-probability sampling does not allow sampling error to be estimated (Lohr, 1999). Although probability sampling is preferable, the technique is often not possible for a variety of reasons, including

the lack of reliable population data and the absence of suitable sampling frames (Craig & Douglas, 2000; Malhotra, Agarwal, & Peterson, 1996).

In this study, probability sampling was ruled out because of the confidentiality of the bank customer's information. It is impossible to obtain a list of customers' information because of the need to adhere to a secrecy provision under Section 133 of the Financial Services Act (2013)[22]. The secrecy provision clearly prohibits a director or officer of any licensed banking institution from producing or disclosing any information pertaining to the affairs and conduct of customer accounts to another party (Bank Negara Malaysia, 2014). Given the situation, the use of a non-probability method is acceptable. This is consistent with Saunders et al. (2012, p. 290) who suggest that "where it is not possible to construct a sampling frame you will need to use non-probability sampling techniques".

Based on previous arguments, non-probability sampling, i.e., convenience sampling, is appropriate when the purpose of the study is to test theory (Leary, 2004; Reynolds et al., 2003; Calder et al., 1981). Given that this research intends to test the theory of the bank customers' behavioural intentions model and the relationship between the five antecedents (i.e. service quality, customer satisfaction, perceived value, corporate image and switching costs), the use of convenience sampling is not a major issue. Theory application research does not require a representative sample nor does it require the ability to estimate sampling error, "because statistical generalization of the findings is not the goal. It is the theory that is applied beyond the research setting that is the goal, and homogeneous samples are preferred because they typically provide a stronger test of the theory" (Calder et al., 1981, p. 200). Similarly, Reynolds et al. (2003) maintain that non-probability sampling is an acceptable method for theoretical test purposes.

Although the sample is selected on the basis of convenience and ease, the data was gathered at different locations (major shopping malls within Klang Valley), on different days of the week, and at different times of the day (see Section 4.2.3.1), and this certainly helps to reduce location and timing biases (Bush & Hair, 1985). Therefore, the use of non-probability sampling, i.e., convenience sampling, is considered acceptable for this study.

#### 4.2.3.3 Self-Administered Questionnaire

As discussed in Section 4.2.1, the minimum sample size needed in this study is 440. Due to the large sample size required, self-administered questionnaires were considered the most appropriate tool. By using this technique, many questionnaires can be distributed

[22] http://www.bnm.gov.my/index.php?ch=en_legislation&pg=en_legislation_act&ac=1079

simultaneously to many respondents in different places. For instance, in this study, the data can be collected from various shopping malls at multiple locations in a relatively short time (Zikmund & Babin, 2007; Malhotra et al., 2002). Overall, this technique is quick, inexpensive, efficient, and can be administered to a large sample (Zikmund, 2013; Sekaran, 2000; Churchill, 1995; McCelland, 1994), partly because self-administered questionnaires is a survey method in which the respondent takes the responsibility for reading and answering the questions (Zikmund et al., 2013).

According to Malhotra (2004) and Sekaran (2000), a higher response rate can also be achieved because the questionnaire can be collected immediately after it is completed. Furthermore, with the researcher present, respondents can clarify any question and will provide answers in accordance with consistent question objectives (Aaker et al., 2005; Sekaran, 2000). This technique also highly motivates respondents to respond because they are not obliged to admit their confusion or ignorance to the interviewer and it produces higher anonymity since respondents are not required to disclose their identity (Burns & Bush, 2002; Sekaran, 2000).

A total of 544 questionnaires were administered over four weeks (1-31 October, 2011), to guarantee that at least 440 usable questionnaires would be collected (see Section 4.2.1). This is because, according to Hair et al. (2010), 100% completion of questionnaires is highly unlikely. Some questionnaires may be unusable or incomplete and invalid; incomplete questionnaires must be excluded from the analysis (Ryu et al., 2012; Tabachnick & Fidell, 2007).

### 4.3 Data Analysis Procedures

All valid responses were analysed using the Statistical Package for Social Sciences (SPSS) Version 18 and Analysis of Moment Structures (AMOS) Version 18, because two data analysis techniques are involved in this study: Exploratory Factor Analysis (EFA) and Structural Equation Modelling (SEM). Therefore, a two-stage process was involved to analyse the data in order to satisfy all research objectives discussed in Chapter 1. During the first stage, the raw data were entered into SPSS Version 18 and were reviewed to ensure that data entry did not include any typographical or other errors. SPSS was used: (1) for data screening procedures or preliminary analyses; (2) to produce the descriptive analysis (frequencies, means and standard deviations for each item) and demographic characteristics of the respondents; (3) to perform EFA; (4) to test for internal consistency (Cronbach's alpha); and (5) to act as an interface for the next analysis, SEM.

The second stage of data analysis involved the use of AMOS software Version 18. The software was used to assess the SEM based on a two-step approach: the measurement model and the structural model (Anderson & Gerbing, 1988). AMOS, introduced by Dr James Arbuckle in 1997, is a software tool using the SPSS interface. Further, the software is a latent variable structural equations program that assists in developing and testing a theoretical model with a unique graphical interface and was specifically designed to make SEM easier without having to think about writing syntax or programming statements (Babin, Hair, & Boles, 2008). AMOS also provides extensive model fit diagnostics, including a large number of the fit indices used in the SEM literature (Bacon, 2009; Bollen, 1989; Tanaka, 1993).

AMOS offers three different modes of model specification: (1) AMOS Graphics (path diagram); (2) AMOS VB.NET; and (3) AMOS C# (work directly from equation statements). "The choice of which AMOS method to use is purely arbitrary and bears solely on how comfortable you feel in working within either a graphical interface or a more traditional programming interface" (Byrne, 2010 p. 17). AMOS Graphics was employed in this study to test the hypothesized model discussed in Chapter Three.

### 4.3.1 Data Screening

Before using EFA and SEM in this study, data screening was conducted to ensure the data were "clean" (Aaker et al., 2005; Bentler & Chou, 1987). Data screening is not only useful for making sure that data have been correctly entered (Coakes, 2006), but it is also crucial for SEM analysis because the procedure helps to clean all the "messy data" (Jackson, Gillaspy, & Purc-Stephenson, 2009). "Messy data" (i.e., missing data, outliers, and non-normal data distribution) always contributes to unsuccesful model estimation in SEM (Kline, 2011; Schumacker & Lomax, 2004). For instance, biased parameter estimates, convergence failures (unable to compute a set of parameter estimates) and inflated fit indices can occur as a result of significant missing data (Brown, 2012; Schumacker & Lomax, 2004).

Outliers are always associated with non-normal data (excessive skewness and/or kurtosis) and most model estimation methods in SEM are based on an assumption of multivariate normality (Ullman, 2006). Therefore assessing data normality is important since non-normal data may result in underestimated or biased standard errors and inflated goodness-of-fit statistics (Yuan & Bentler, 2001; Hu & Bentler, 1995; Chou, Bentler, & Satorra, 1991). However, these effects are lessened with larger sample sizes (Lei & Lomax,

2005). Details of each of the data screening procedures used in this study are described in the following subsection.

#### 4.3.1.1 Missing Data

Ignoring the cases that have missing values can result in biased and/or inefficient inference (Jamshidian & Jalal, 2010). According to Hair et al. (2010 p. 633), "...missing data must always be addressed if the missing data are in a nonrandom pattern or more than 10 percent of the data items are missing". Four approaches are normally used for solving missing data problems: (1) listwise deletion, (2) pairwise deletion, (3) mean substitution, and (4) model-based approaches (Hair et al., 2010; Jackson et al., 2009; Schreiber, Nora, Stage, Barlow, & King 2006). In general, pairwise deletion is not recommended and listwise deletion is problematic unless the missing data are missing at random (MAR) (Schreiber et al., 2006). If missing data account for a small proportion of the sample data or the data is less than 10 percent, Schumacker and Lomax (2004) suggest that mean substitution is the most applicable approach for handling missing data. Additionally, according to Sekaran (2005), questionnaires of more than 25% incomplete responses or left unanswered should be excluded from the analysis. This is due to excessive missing data in the questionnaire. However, the incomplete demographic data such as age and gender could be retained for analysis provided the responses to the items for testing the hypotheses were satisfactory.

#### 4.3.1.2 Outliers

According to Kline (2011 p. 54) "outliers are scores that are different to the rest" or observations that have an extreme value, which are unusually large or unusually small values in a data set (Hair et al., 2010; Anderson, Sweeney & Williams, 2009). The presence of extreme outliers possibly will lead to non-normality of the data and distorted statistics (Tabachnick & Fidell, 2007). There are two methods for detecting outliers: univariate and multivariate, which were used in this study. First, an examination of the univariate outliers was carried out. According to Kline (2011, p. 54), "a case can have a univariate outlier if it is extreme on a single variable" and was identified based on standardized values, *Z*-scores (Kline, 2011; Hair et al., 2010; Tabachnick & Fidell, 2007). Following Hair et al. (2010), a common rule of thumb (for samples of more than 80), is that any cases with a standardized value of less than -4 or greater than +4 should be removed from the database because such a value indicates an outlier.

Further, when several variables are combined, some univariate outliers may also become multivariate outliers (Hair et al., 2010; Tabachnick & Fidell, 2007). Accordingly,

multivariate outliers in a dataset are determined using the Mahalanobis distance (Byrne, 2010; Tabachnick & Fidell, 2007). The existence of multivariate outliers was evaluated based on a cut-off value of p1, and p2 less than 0.05 in the Mahalanobis $d^2$ test (Kline, 2011). Deletion of an outlier will decrease Mardia's multivariate kurtosis. Outliers can be deleted, one at a time, until the multivariate kurtosis index reaches the desired level.

However, deletion of outliers is not easy; it should be handled carefully (see Barnett & Lewis, 1994) because deletion often results in the generation of further outliers (Pallant, 2007). According to Gao, Mokhtarian, and Johnston (2008), the drawback in deleting outliers is obvious; it means the loss of observations and hence, information and model power. The next step is to assess the normality.

#### 4.3.1.3 Normality Test

After the outlier tests, an assessment of normality was carried out (Hair et al., 2010; Tabachnick & Fidell, 2007; Churchill & Iacobucci, 2004). Normality describes the degree to which the data are normally distributed (Hair et al., 2010; Ferdinand, 2006; Anderson & Gerbing, 1988). Normality can be assessed using two standard measures: (1) skewness; and (2) kurtosis (Field, 2009; Ullman, 2006; McDonald & Ho, 2002; Bollen, 1989). Skewness implies the degree of asymmetry of the distribution whereas kurtosis relates to the 'peakedness' of a distribution (Tabachnick & Fidell, 2007). A distribution is said to be normal when the values of skewness and kurtosis equal zero (Tabachnick & Fidell, 2007).

In this study, both univariate and multivariate normality distributions were tested using SPSS 18 and AMOS 18. Univariate normality describes the distribution of only one variable in the sample, whereas multivariate normality describes the joint distribution of all variables in the sample (Gao, Mokhtarian, & Johnston, 2008). For univariate normality, several researchers suggest that an absolute value of skewness greater than 3.0 indicates problems with normality (Kline, 2011; Chou & Bentler, 1995; West et al., 1995; Hu et al., 1992). Conversely, an absolute value of kurtosis greater than 8.0 may suggest a problem and values greater than 20.0 may indicate serious deviations from normality (Kline, 2011; Hoyle, 1995).

Next, multivariate normality was evaluated using Mardia's (1970) coefficient based on multivariate kurtosis (Gao et al., 2008; Ullman, 2006; McDonald & Ho, 2002). The value of multivariate kurtosis reflects the multivariate normality distribution for a data set. The value of multivariate kurtosis should for example, for a model with three constructs, be less than 50.0 otherwise the assumption of multivariate normality is not satisfied (Awang, 2012).

### 4.3.2 Procedures for Splitting the Data

After data screening, the finalized data set was randomly split into two sub-samples for further analysis. The sample size of each sample group was according to the minimum size requirements explained in Section 4.2.1. One portion of the sample was subjected to EFA (principal-components analysis with varimax rotation); the other portion was subjected to SEM (Tabachnick & Fidell, 2007).

The procedure of splitting the data set was based on the recommendations of several researchers (Kline, 2011; Hair et al., 2010; Schumacker & Lomax, 2004). According to Schumacker and Lomax (2004, p. 108) "...a researcher could begin model generation by using exploratory factor analysis (EFA) on a sample of data to find the number and type of latent variables in a plausible model. Once a plausible model is identified, another sample of data could be used to confirm or test the model, that is, confirmatory factor analysis (CFA)". Kline (2011) claims that it is not appropriate to run EFA and CFA using the same data. This is because factor structures identified through EFA sometimes may have a poor fit to the same data when evaluating using CFA, which eventually may lead to rejection of the CFA model (van Prooijen & van der Kloot, 2001). Considering all the suggestions, splitting the sample into two data sets in this study was deemed appropriate.

### 4.3.3 Exploratory Factor Analysis

EFA was first conducted using SPSS 18 to identify the underlying factors that make up the subdimensions of each primary dimension of retail bank service quality in Malaysia (Clemes 2014, 2011, 2010; Tabachnick & Fidell, 2007; Brady & Cronin, 2001; DeVellis, 1991). In this study, EFA serves a subsidiary role, merely helping to prepare for the hypothesis testing that is the central purpose of the study (Conway & Huffcutt, 2003). Basically, EFA, a data-driven approach, provides procedures for determining the underlying structure of a relatively large set of variables (Fabrigar, 1999; Stewart, 1981).

According to Schumacker and Lomax (2004), EFA can help a researcher identify a number of factors, identify whether the factors are correlated, and which observed variables appear to best measure each factor. EFA is also known as a useful scale development technique for reducing large numbers of indicators to a more manageable set (Russell, 2002; Gerbing & Anderson, 1988). This study purified the service quality scales using factor analysis as suggested by Worthington and Whittaker (2006).

#### 4.3.3.1 Performing Exploratory Factor Analysis – Tests and Interpretation

##### 4.3.3.1.1 *Factor Loadings*

As no prior theory is required in EFA, factor loadings were used to decide the factor structure of the data (Hair et al., 2003). Factor loadings represent the direction and size of the correlations between factors and variables (Hair et al., 2010; Kim & Mueller, 1978). Hair et al., (2010) propose that factor loadings in the range ±0.30 to ±0.40 meet the minimal level for interpretation of structure. Loadings of ±0.50 or greater are considered practically significant and loadings exceeding ±0.70 indicate a well-defined structure. The goal of any factor analysis is to achieve loadings exceeding ±0.70. However, if the absolute value of a factor loading is above ±0.30, the results are considered meaningful.

There are also suggestions that the significance of factor loadings depends on sample size (Hair et al., 2010; Field, 2009). Guidelines proposed by Hair et al. (2010) show that the smaller the sample size, the larger the loadings that are to be considered statistically meaningful (see Appendix 3). Items with factor loadings of less than ±0.50 were removed since the sample size for EFA set in this study is 240. Crossloading items were also removed from the item pool.

##### 4.3.3.1.2 *Tests for Determining Appropriateness of Exploratory Factor Analysis*

Before proceeding with factor analysis, various examinations and tests need to be conducted. The objective of the tests is to confirm that the data matrix has sufficient correlations. This probably justifies the appropriateness of the application of factor analysis (Pallant, 2007). There are several approaches available for ensuring the data matrix is suitable for factor analysis including:

1. *Examination of the Correlation Matrix*

   A correlation matrix displaying the relationships between individual variables is a simple method for determining the appropriateness of factor analysis (Hair et al., 2010). The correlation matrix for correlation coefficients must be over 0.30 since that value indicates that the items share common factors (Pallant, 2007; Tabachnick & Fidell, 2007). Conversely, correlations in the range 0.10 to 0.30 are considered weak and not suitable for factor analysis (Hardy & Bryman, 2004; Stewart, 1981). If there are not considerable numbers of correlations greater than 0.30 in a data matrix, the researcher should reconsider whether factor analysis is the appropriate statistical method to use (Hair et al., 2010; Tabachnick & Fidell, 2007).

2. *Inspection of the Anti-Image Correlation Matrix*

The Anti-image correlation matrix represents the negative matrix values of partial covariance and correlations among items (Cooper et al., 2003). The values examined for this analysis are the off diagonal values. If there are many large values in the off-diagonal, factor analysis should not be used because this indicates that the unexplained correlations are high in the data matrix (Hair et al., 2010). Small anti-image correlations indicate that the data matrix is appropriate for factor analysis (Field, 2009; Tabachnick & Fidell, 2007).

3. *Bartlett's Test of Sphericity (Bartlett, 1950)*

Bartlett's Test of Sphericity is a statistical test for the presence of correlations among variables (Hair et al., 2010). Bartlett's Test of Sphericity should be significant ($p < .05$) for factor analysis to be suitable (Hair et al., 2010; Tabachnick & Fidell, 2007).

4. *The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (Kaiser, 1970)*

The Kaiser-Meyer-Olkin measure (KMO) is an index that measures the degree of intercorrelations among the variables (Stewart, 1981). The KMO index ranges from 0 to 1, with an index below 0.50 considered unacceptable; 0.50 to 0.59, miserable; 0.60 to 0.69 mediocre; 0.70 to 0.79, middling; 0.80 to 0.89, meritorious; and 0.90 and above, marvellous (Kaiser & Rice, 1974). Based on these guidelines, values greater than 0.50 are considered acceptable and appropriate for factor analysis (Hair et al., 2010; Tabachnick & Fidell, 2007).

#### 4.3.3.1.3 *Factor Extraction Method*

Factor extraction was performed once the data matrix was confirmed appropriate for factor analysis. Principal Components Analysis (PCA) was chosen as the factor extraction method for extracting the factors for all 82 items proposed. Besides PCA, there is another factor extraction method known as common factor analysis (Costello & Osborne, 2005; Conway & Huffcutt, 2003; Russell, 2002; Fabrigar, 1999). The objective of common factor analysis is to explain the interrelationships among the original variables. The objective of PCA is to select the components that explain as much of the variance in a sample as possible (Hutcheson & Sofroniou, 1999). PCA was applied in this study because many researchers claim it gives almost identical results to factor analysis (i.e., Goldberg & Digman, 1994; Schoenmann, 1990; Steiger, 1990; Velicer & Jackson, 1990; Guadagnoli &Velicer, 1988).

#### 4.3.3.1.4 *Number of Factors Retained*

After factor extraction, the researcher must decide how many factors to retain as meaningful or important for rotation (Costello & Osborne, 2005; Russell, 2002). Available options commonly used by researchers include: (1) Kaiser's (1958) "eigenvalues greater than one" rule or the latent root criterion; (2) the percentage of variance criterion; and (3) the scree test criterion (Hair et al., 2010; Janssens et al., 2008; Pallant, 2007; Stewart, 1981). Gorsuch (1983) suggests using eigenvalues greater than 1.0 or the latent root criterion, whenever PCA is chosen as the extraction procedure. Eigenvalues refer to the amount of variance explained by a factor and are computed by squaring the loadings on a factor and summing them (Russel, 2002). Only factors with eigenvalues of greater than 1.0 are retained and considered significant (Pallant, 2007; Costello & Osborne, 2005).

However, a number of studies demonstrate that eigenvalues greater than 1.0 or the latent root criterion are among "the least accurate methods" because it does not consistently give a precise number of factors (Henson & Roberts, 2006; Russell, 2002; Fabrigar et al., 1999; Gorsuch, 1997; Velicer & Jackson, 1990). As a result, this study uses multiple techniques to determine the number of factors i.e., eigenvalues greater than 1.0 or the latent root criterion; percentage of variance criterion; and the scree test criterion (Henson & Roberts, 2006).

Based on the percentage of variance criterion, a solution that accounts for 60 percent of the total variance is considered satisfactory (Hair et al., 2010). The purpose of this criterion is to ensure practical significance for the derived factors by ensuring that they explain at least a specified amount of total variance (Hair et al., 2010). Next, the scree test procedure (Cattel, 1958) is tested by examining the graph of the eigenvalues using SPSS. Costello and Osborne (2005 p. 3) describe the scree test as "looking for the natural bend or break point in the data where the curve flattens out". To decide how many factors to retain, the number of data points above the "break" commonly are taken into account (Costello & Osborne, 2005). Several studies indicate that examining the scree plot for breaks is a reasonably accurate indication of the number of factors (Fabrigar et al., 1999; Stewart 1981).

#### 4.3.3.1.5 *Factor Rotation*

The goal of rotation is to simplify and clarify the data structure (Costello & Osborne, 2005). Rotation of the factors involves reorienting them or altering the location of the factors in the dimensional space to improve the interpretability of the results (Russell 2002). Two basic types of rotation can be conducted: (1) orthogonal rotation; and (2) oblique rotation

(Hair et al., 2010; Pallant, 2007; Henson & Roberts, 2006). Orthogonal rotation involves rotating the factors that have been extracted, forcing the factors to be uncorrelated with one another (Costello & Osborne, 2005; Russell 2002; Fabrigar et al., 1999). Conversely, oblique rotation allows the factors to correlate with one another (Henson & Roberts, 2006; Costello & Osborne, 2005; Fabrigar et al., 1999).

To simplify and clarify the data structure, orthogonal rotation with VARIMAX rotation was used in this study because this particular method simplifies the columns of the factor matrix (Larose, 2006). A VARIMAX rotation is by far the most common choice because it produces more easily interpretable results (Meyers et al., 2006; Costello & Osborne, 2005; Conway & Huffcutt, 2003; Fabrigar et al., 1999). "Interpretable results" are referred to as "simple structure" by Thurstone (1947). Fabrigar et al. (1999) describe "simple structure" as each factor having a subset of variables with high loadings, and the rest with low loadings.

### 4.3.4 Structural Equation Modelling Procedures

Structural equation modelling (SEM), a second-generation multivariate technique, is considered an important branch in multivariate analysis, that integrates factor analysis and path analysis (Bollen, 1989; Fornell, 1982). The technique provides different angles and opportunities of analysis in social science research (Babin & Svensson, 2012; Ullman, 2007; Bollen, 1989). Over the years, SEM has been increasingly recognized as a useful quantitative method in specifying, estimating, and testing a series of hypothesized theoretical models that describe multiple and interrelated dependency relationships between a set of latent (unobserved) constructs (Hair et al., 2010, p. 609). Each construct is measured by one or more observed variables demonstrating how sets of observed variables (indicators) define latent constructs (Reisinger & Mavondo, 2007; Schumacker & Lomax, 2004). One of the primary reasons for this recognition is the ability of the technique to assess simultaneously the fit of measurement models and the structural models (Byrne, 2010; Schumacker & Lomax, 1996). Measurement models test relationships (i.e., paths) between observed variables (i.e., indicators) and the constructs (i.e., latent variables) that they represent, whereas structural models specify relationships between the latent variables of interest (Hoe, 2008; Landis, Beal, & Tesluk, 2000). By these means, researchers can assess the psychometric properties of measures and estimate relationships among constructs that are corrected for biases attributable to random error and construct-irrelevant variance (Bollen 1989). Overall, the SEM technique is known for theory testing and confirming theoretical

models in a quantitative approach (Babin & Svensson, 2012; Kline, 2011; Hair et al., 2010; Schumacker & Lomax, 2004; Anderson & Gerbing, 1988; Bagozzi, 1980). SEM offers several advantages over multiple regression and other traditional multivariate techniques. The discussion follows:

(1) SEM can be used to study the relationships among multiple latent constructs that are indicated by multiple measures (Henseler, 2012; Holmbeck, 1997) and simultaneously test a series of dependence relationships (Babin & Svensson, 2012; Shook et al., 2004). This technique can test the relationships among independent variables (exogenous constructs) and dependent variables (endogenous constructs), even when the dependent variable becomes an independent variable in other relationships. Most importantly, SEM can be statistically modelled and tested even in complex phenomena, with intervening variables (i.e., mediator and moderator) between independent and dependent variables (Schumacker & Lomax, 2004).

(2) SEM can also test models that include multiple levels of hierarchically structured data (Duncan et al., 2002). Ullman (2007, p. 679) claims that "when the phenomena of interest are complex and multidimensional, SEM is the only analysis that allows complete and simultaneous tests of the relations".

(3) There is greater recognition of SEM dedicated to the validity and reliability of measurement instruments (Schumacker & Lomax, 2004). The SEM technique provides much more rigorous tests of construct reliability, convergent validity and discriminant validity (e.g., Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Bagozzi, 1980) as well as a way of correcting structural relationships for error variance (Babin & Svensson, 2012). According to Chau (1997), SEM can be used to examine scale validation and possibly modify scales for better psychometric properties, and re-specify the hypothesized model for better model fit (model testing).

(4) Another great advantage of SEM is that measurement error is present together with latent and observed variables in the model (Henseler, 2012). Measurement error refers to differences between a respondent's true value on the construct of interest and the obtained measurements (Baumgartner & Steenkamp, 2000). Measurement error has become a major issue in many disciplines (Schumacker & Lomax, 2004, p. 7). This is because the measurement error biases parameter estimates, and the bias does not go away as the number of observations increase. Most econometric approaches typically used to model observed variables, do not take into account measurement error in the exogenous variables (Steenkamp & Baumgartner, 2000). However, SEM makes it

possible to identify measurement errors and remove them from the data (Henseler, 2012; Steenkamp & Baumgartner, 2000; Bagozzi & Phillips 1982). Taking measurement error into account helps improve the statistical estimation of the relationships between concepts. This is due to the fact that a concept cannot be perfectly measured, some degree of measurement error is always present (Hair et al., 2010).

(5) Finally, SEM usage has increased since the 1990s due to the accessibility of various user-friendly software packages (e.g., AMOS) and also the literature provides easy to follow guidelines for usage (i.e., Kline, 2011; Byrne, 2010; Hair et al., 2010; Schumacker & Lomax, 2004). Most SEM software contains features similar to other Windows-based software packages such as using pull-down menus or drawing programs to generate the program syntax internally (Schumacker & Lomax, 2004). As a result, the frequency of marketing papers applying SEM has continued to rise (Babin, Hair, & Boles, 2008).

Because of these advantages, SEM is regarded as a powerful statistical technique and has been used extensively to test the relationships among latent constructs across different disciplines including the behavioural and social sciences (Hair et al., 2010; Hooper, Coughlan & Mullen, 2008; Reisinger & Mavondo, 2007; Sudhahar, Israel, Britto, & Selvam, 2006; McDonald & Ho, 2002; MacCallum & Austin, 2000; Bagozzi & Yi, 1988). According to Babin and Svensson (2012, p. 321), "the methodological benefits and potential of SEM in social science research are appealing (though challenging) as it may contribute to moving theory to new levels of understanding and explanations of human perceptions, behaviours and phenomena". This technique has long been known in marketing and has turned out to be an important statistical tool in theory testing (Babin et al., 2008; Steenkamp & Baumgartner, 2000; Bollen, 1989; Bagozzi, 1980).

Considering all the advantages discussed, as well as satisfying the objectives of this study (see Section 1.4) that involve theory testing, employing the SEM technique as a primary research vehicle in this study is therefore acceptable.

#### 4.3.4.1 Two-Step Approach

The data were analyzed following Anderson and Gerbing's (1988) two-step model building approach to assess the fit of the hypothesized model: (1) the measurement model and (2) the structural model. Following this approach, the measurement model is first refined and

confirmed before testing the structural model. If the measurement model provides an acceptable fit to the data, the structural model then provides an assessment of the extent of the relationships between the hypothesized constructs (Byrne, 2010).

The rationale behind this two-step approach was highlighted by Anderson and Gerbing (1982, p. 453): "...proper specification of the measurement model is necessary before meaning can be assigned to the analysis of the structural model". In addition, Jöreskog and Sörbom (1993, p. 113) emphasize that: "The testing of the structural model, i.e., the testing of the initially specified theory, maybe meaningless unless it is first established that the measurement model holds. If the chosen indicators for a construct do not measure that construct, the specified theory must be modified before it can be tested".

The combined analysis of the measurement and structural models enables: (1) measurement errors of the observed variables to be analyzed as an integral part of the model, and (2) factor analysis to be combined in one operation with hypotheses testing. The result is a more rigorous analysis of the proposed research model and very often, a better methodological assessment tool (Bullock, Harlow, & Mulaik, 1994; Bollen, 1989). On this basis, many researchers agree that the measurement model should be tested before the structural relationships are tested, and they encourage this two-step approach to be applied in future studies (Hair et al., 2010; Schreiber et al., 2006; Schumacker & Lomax, 2004; McDonald & Ho, 2002). A considerable number of marketing studies have adopted this two-step approach (e.g., Clemes et al., 2014, 2011; Lu et al., 2009; Pollack, 2009; Martínez García & Martínez Caro, 2008; 2007; Olorunniwo et al., 2006; Kim, 2003; Brady & Cronin, 2001). Accordingly, the two-step approach is applied in this study. Further discussion on the measurement and structural models is presented in the following subsections.

#### 4.3.4.2 The Measurement Model

The measurement model is a sub-model in structural equation modelling that (1) specifies the links between the observed measures (a set of indicators) and their posited underlying constructs; and (2) accounts for measurement error by identifying common variances and covariances among the observed variables (Kline, 2011; MacKenzie et al., 2011; Byrne 2010; Muthén & Muthén, 2010; Jarvis, MacKenzie, & Podsakoff, 2003; McDonald & Ho, 2002; Jöreskog & Sörbom, 1993; Anderson & Gerbing, 1982).

According to Chau (1997), the measurement model is developed based on a priori information about the data structure in the form of a specified theory or hypothesis or knowledge from previous studies. In a measurement model, it is a common practice not to

have an indicator load on more than one construct (McDonald & Ho, 2002). Multiple-indicator measurement models (Anderson & Gerbing, 1982) are preferred because they allow the most unambiguous assignment of meaning to the estimated constructs (Anderson & Gerbing, 1988).

#### 4.3.4.3 Reflective Versus Formative Factor Models

In a measurement model, the latent constructs can have reflective indicators or formative indicators (Kline, 2011; McKenzie et al., 2011; Jarvis et al., 2003; Bollen & Lennox, 1991; Bagozzi & Fornell, 1982; Fornell & Bookstein, 1982). "A reflective measurement theory is based on the idea that latent constructs cause the measured variables and that the error results in an inability to fully explain these measured variables. Thus, the arrows are drawn from latent constructs to measured variables", (Hair et al., 2006, p. 786). These types of construct can be viewed as underlying factors (Bagozzi, 1982; Fornell & Bookstein, 1982). In contrast, a formative measurement theory is modelled based on the assumption that the measured variables cause the construct (Hair et al., 2010). The measurement error is at the construct level, meaning that part of the construct is not explained by the measures. Simply, reflective indicators depend on the constructs whereas formative indicators influence the constructs (Bollen, 1989).

Three things need to be considered when choosing either reflective or formative modes: (1) the study objective; (2) the theory; and (3) the empirical contingencies (Fornell & Bookstein 1982). Based on Fornell and Bookstein's (1982) guidelines, the reflective mode should be applied if the study intends to account for observed variance; the theory that views the unobserved constructs as underlying factors that give rise to something that is observed, and high correlations between observable indicators are expected. Due to the high correlations between the indicators, the indicators are also interchangeable and dropping an indicator should not alter the conceptual meaning of the construct (Jarvis et al., 2003). The reverse scenario suggests the formative mode. Following Fornell and Bookstein's (1982) guidelines, all constructs in this study are modelled as reflective.

#### 4.3.4.4 Confirmatory Factor Analysis

The purpose of evaluating the measurement model is to investigate the relationships between the latent variables and their indicators, and to determine the reliability and validity of the indicators measured, to represent the constructs of interest (Jöreskog & Sörbom, 1993), or simply to verify the psychometric properties of the measurement model. Hence, a confirmatory factor analysis (CFA) using AMOS 18 was conducted to test the measurement

model in this study (Kline, 2011; Hair et al., 2010; Chau, 1997). The CFA method was first developed by Karl Jöreskog in the 1960s to test whether a set of items defines a construct (Schumacker & Lomax, 2004). The method, widely used for assessing a latent structure, develops an a priori model based on previous studies and is driven by a theoretical basis (Byrne, 2010; Ullman, 2006; Kim & Mueller, 1978). The main role of CFA is to focus on developing and refining measurement instruments, and assessing construct validity (Brown, 2012; Hair et al., 2010).

In this study, CFA was performed on the remaining samples to serve as cross-validation for the exploratory factor analysis. Next, as CFA provides diagnostic information about the reliability and validity of a construct, satisfactory psychometric properties are further verified (Dagger et al., 2007; Noar, 2003; Fornell & Larcker, 1981). The psychometric properties of interest are convergent validity (i.e., average variance extracted and construct reliability) and discriminant validity, for each latent construct. Further discussion of psychometric properties is reported in Section 4.3.4.7. Obviously, if the measurement properties prove to be inadequate, it is not appropriate to proceed to theory testing (Fornell & Larcker, 1981). This is because the validity of the final results of the structural model depends on capturing and establishing the reliability of the underlying constructs. Without empirical evidence for this, the relationships found significant in the structural model maybe misleading (Kline, 2011).

CFA was carried out to assess the psychometric properties of the measurement models developed in this study: subdimensions, primary dimensions and the six major constructs. Analysis of the subdimensions and primary dimensions of service quality were performed separately because of the large number of items used to define the constructs (Brady & Cronin, 2001). Accordingly, two types of analysis model are involved: (1) a first-order CFA model; and (2) a second-order CFA model (Byrne, 2010). The purpose of the first-order CFA model is to test the correspondence between the first-order latent factors and the observed indicators. The second-order CFA model was performed to assess whether the second-order latent variable is a multidimensional construct composed of multiple first-order factors, explained by their corresponding observed indicators.

First, three first-order models of the subdimensions, (1) Interaction Quality (see Figure 4.1); (2) Physical Environment Quality (see Figure 4.2); and (3) Outcome Quality (see Figure 4.3); were tested and confirmed, followed by the primary dimensions (see Figure 4.4); and ultimately the six major constructs (see Figure 4.5).

**Figure 4.1: First Order Model for the Interaction Quality Subdimensions**

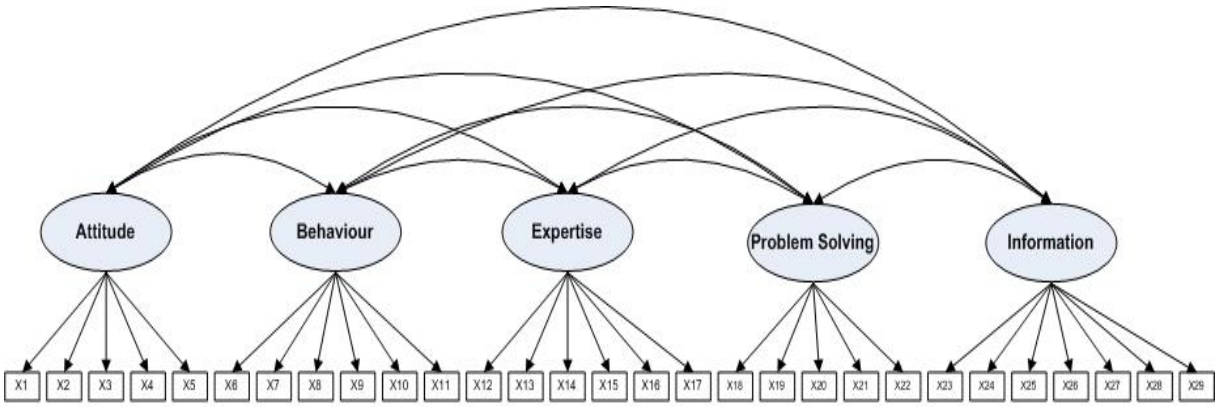



**Figure 4.2: First Order Model for the Physical Environment Quality Subdimensions**

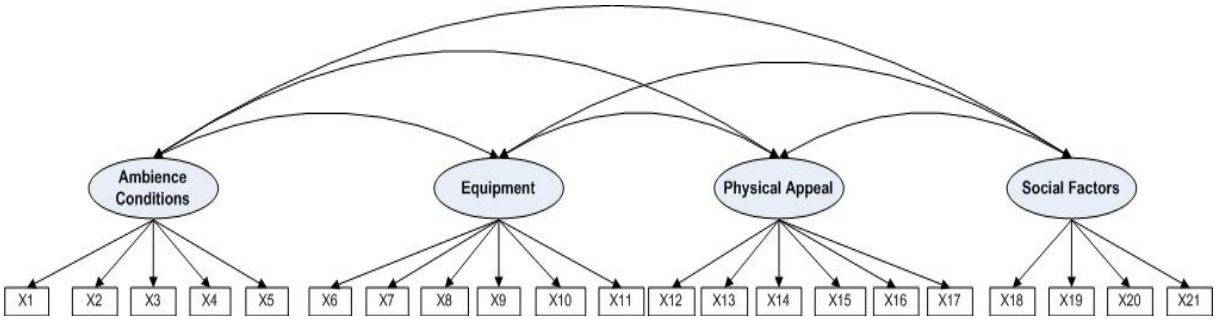



**Figure 4.3: First Order Model for the Outcome Quality Subdimensions**

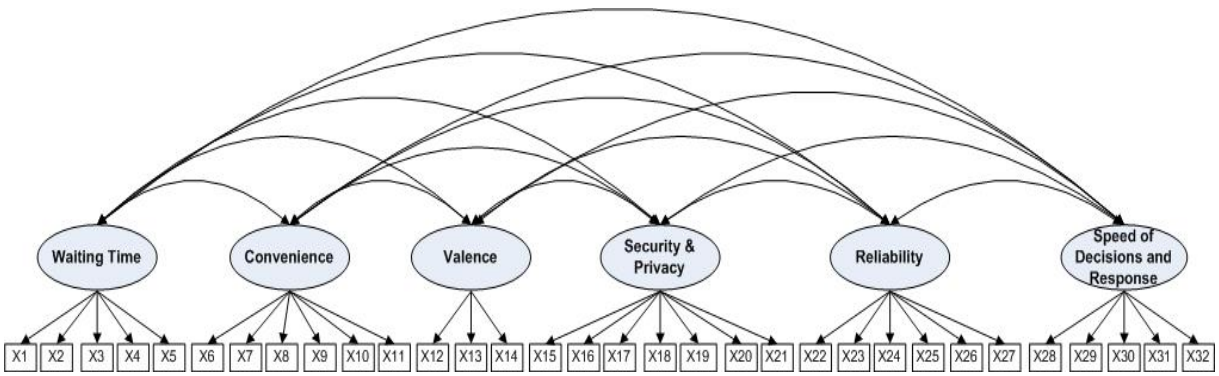


**Figure 4.4: First Order Model for the Primary Dimensions**

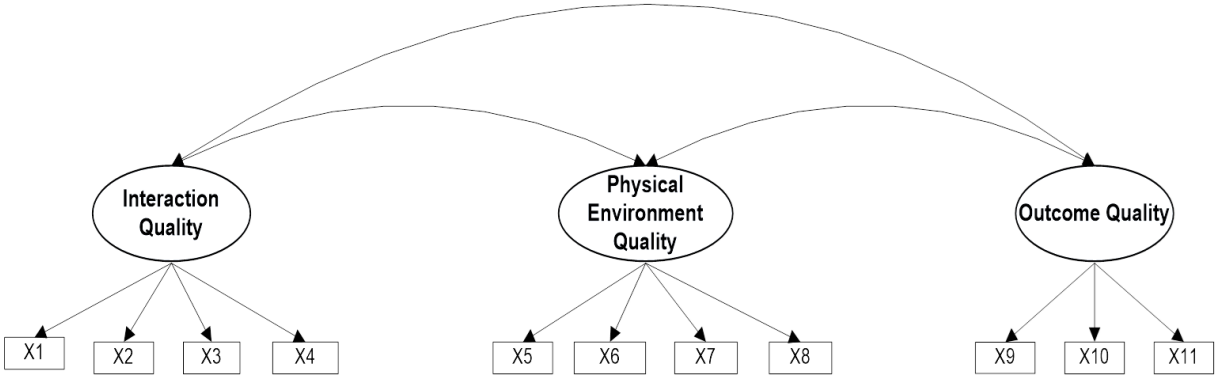
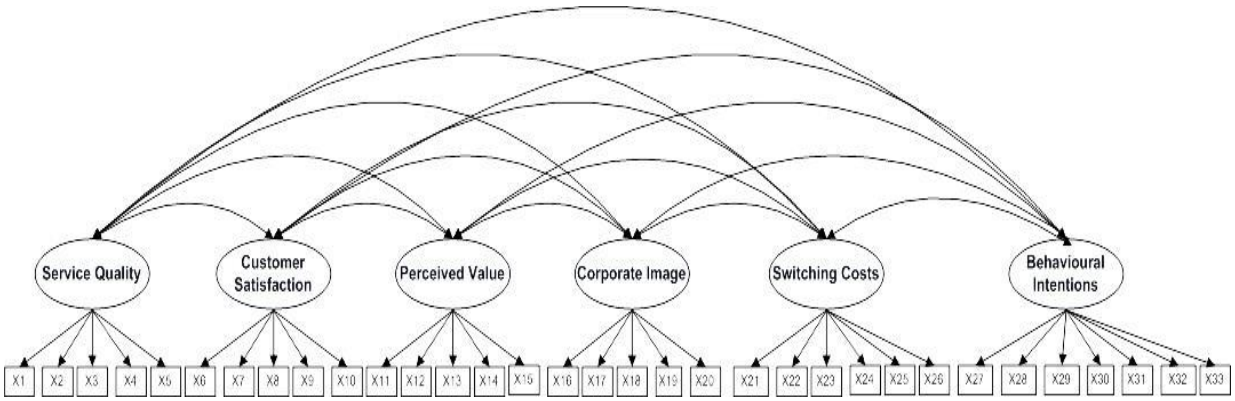



**Figure 4.5: First Order Model for the Six Constructs**




Four second-order CFA models for, (1) Interaction Quality (see Figure 4.6); (2) Physical Environment Quality (see Figure 4.7); (3) Outcome Quality (see Figure 4.8); and (4) Service Quality (see Figure 4.9); were tested.

**Figure 4.6: Second Order Model for the Interaction Quality**

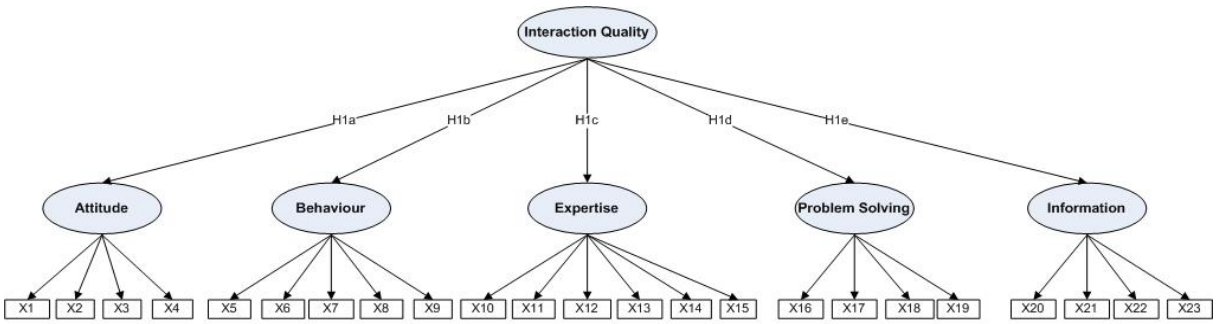


**Figure 4.7: Second Order Model for the Physical Environment Quality**

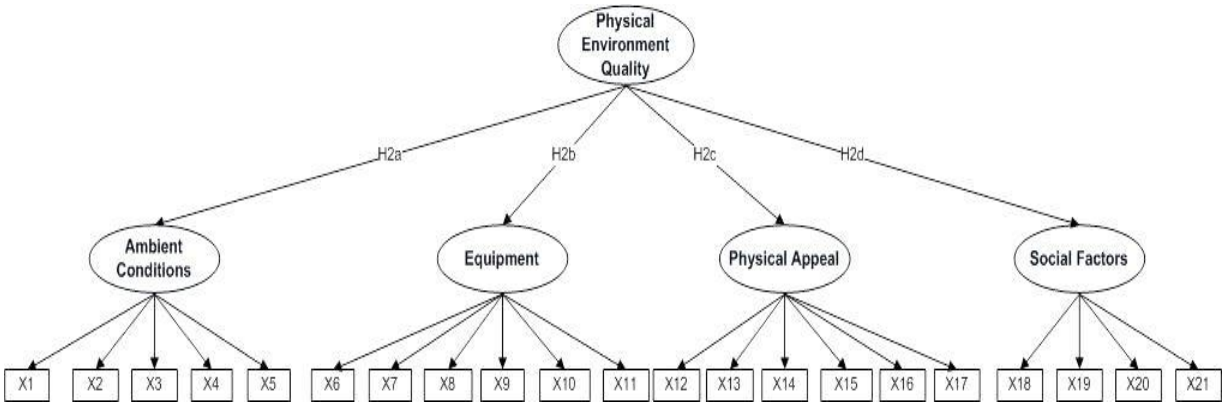



**Figure 4.8: Second Order Model for the Outcome Quality**

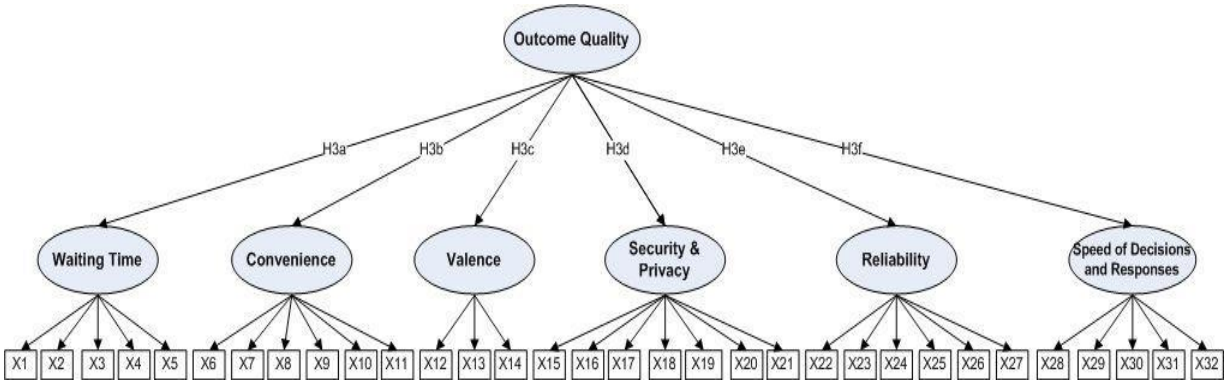
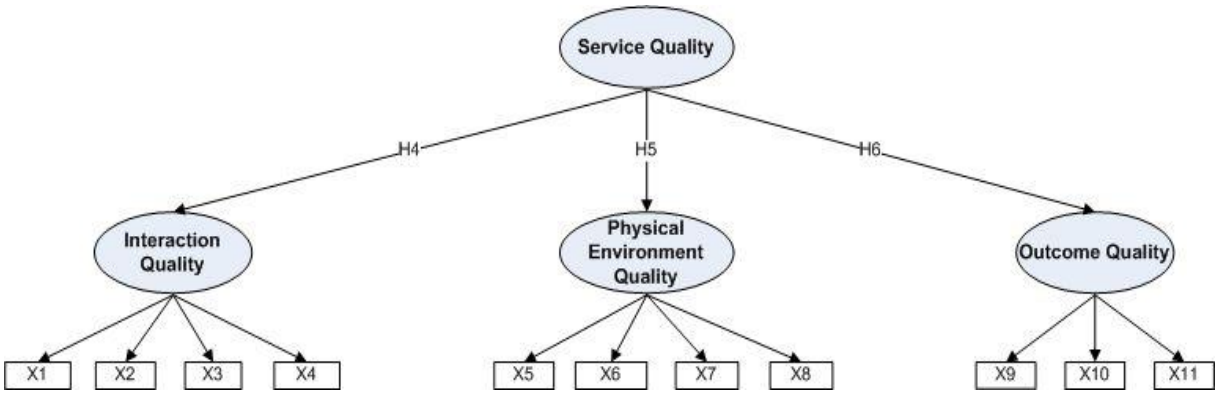



**Figure 4.9: Second Order Model for the Service Quality**



The CFA used in this study involves several procedures: (1) develop a priori model based on previous studies and hypothesized relationships between observed indicators and unobserved constructs; (2) fit the model to sample data; (3) evaluate the model in terms of goodness of fit and parameter estimates; and (4) re-specify or modify the model to improve its fit to the data (Hair, et al., 2010; Chau, 1997; Segars, 1994). The next subsection explains further details regarding CFA and SEM procedures.

#### 4.3.4.5 Modelling Assessment Procedures

SEM applications typically follow a five-step process (Kline, 2011; Hair et al., 2010; Schumacker & Lomax, 2004; McDonald & Moon-Ho, 2002; Bollen & Long, 1993). The five-steps are: (1) model specification; (2) model identification; (3) model estimation; (4) model evaluation; and (5) model modification. Issues pertaining to each of these steps are discussed below.

- **Step 1: Model Specification**

Model specification is usually guided by a combination of theory and empirical results from previous research (Hox & Bechger, 1998, p. 4). The procedure involves determining every relationship and parameter in the model that is of interest to the researcher (Kline, 2011; Schumacker & Lomax, 2004). The estimated loadings, error variances and covariances in the measurement model, and the estimated directed arc coefficients and disturbance variances and covariances in the path model, are the parameters in SEM (Reisinger & Mavondo, 2007). The measurement model in this study was specified based on the following suggestions:

(1) one of the factor loadings on each construct needs to be fixed to a specific value (1 is typically used) and all other factor loadings either freely estimated on a specific factor or fixed to zero on other factors;

(2) all covariance parameters need to be correlated and freely estimated in the first-order CFA; covariations among the first-order factors need to be fully explained by their regression on the higher-order factor in the second-order; and

(3) error terms related to each measured item need to be uncorrelated.

(Byrne, 2010; Hair et al., 2010; Reisinger & Mavondo, 2007)

- **Step 2: Model Identification**

Issues in model identification need to be resolved before estimation of the parameters in measurement models or structural models are made (Ullman, 2006; Schumacker & Lomax, 2004; Bollen, 1989). A model is said to be identified if there is a unique numerical solution for each parameter in the model (Kline, 2011; Ullman, 2006). A necessary identification condition is that the number of parameters of the model do not exceed the degrees of freedom in the model (Byrne 2010; Ullman, 2006). Basically, three levels of model identification are recognized (Kline, 2011; Byrne 2010; Ullman 2006):

(1) *Under-identified:* the model is said to be *under-identified* when there are fewer data points (i.e., variances and covariances) than parameters to be estimated. As such, the model contains insufficient information (from the input data) and if this condition occurs, parameters cannot be estimated.

(2) *Just-identified:* if there are the same number of data points as parameters to be estimated, the model is said to be *just-identified*. In this case, the estimated parameters perfectly reproduce the sample covariance matrix, and the chi-square test statistic and degrees of freedom are equal to zero. Although this type of model is able to yield a unique solution for all parameters, it is not scientifically interesting because it has no degrees of freedom and therefore can never be rejected.

(3) *Over-identified:* hypothesized models with more data than parameters to be estimated are said to be *over-identified*. This is the most desirable situation and means that there is more than enough information supplied and that the net degrees of freedom are greater than 0, for the model to be satisfied. Basically, only models that are identified can be estimated.

One of several tests associated with identification is known as the t-rule (Kline, 2011; Byrne, 2010; Kelloway, 1998; Bollen, 1989). The t-rule refers to the requirement that the number of variances and covariances (p[p+1]/2) must equal or be greater than the total number of parameters, where p is the total number of observed variables. A model is identified when the t-rule is satisfied (Byrne, 2001). For these reasons, three significant indicators per factor are recommended (Hair et al., 2010; Schumacker & Lomax, 2006). Another alternative test is the order condition (Hair et al., 2010). The order condition requires that the net degrees of freedom for a model must be greater than zero (i.e., positive degrees of freedom). According to Schumacker and Lomax (2004), the number

of free parameter estimates must be less than or equal to the number of unique covariance and variance terms. A CFA model is identified when the order condition is satisfied.

- **Step 3: Model Estimation**

Once the identification problem has been satisfied, the next step is to estimate the parameters in the hypothesized structural model. Several parameter estimate methods are available in any standard SEM software package. Maximum likelihood estimate (MLE) is among them. MLE was employed in this study as an estimation method for several reasons. Under the assumption of a multivariate normal distribution, MLE has been considered most appropriate, especially with larger samples (Jöreskog & Sörbom, 1982). In this study, a larger sample size (i.e., 251 respondents) was used to test the hypotheses. Additionally, MLE is robust compared with other methods even if multivariate normality is violated (Boomsma, 1983). MLE is a relatively unbiased estimation of path estimates and does not depend on the measurement scale. Further, this method is not only consistent and efficient, it also demonstrates higher accuracy in terms of empirical and theoretical fit compared with other estimators (Olsson, Foss, Troye, & Howell, 2000; Anderson & Gerbing, 1988; Boomsma, 1983).

- **Step 4: Model Evaluation**

After parameter estimation is completed, researchers need to examine to what extent the theoretical model is supported by the obtained sample data or how well the data fits the model. This study evaluated the model based on: (1) model fit criteria; and (2) individual parameters of the model (Schumacker & Lomax, 2004). In line with the first approach (i.e., model fit criteria), Bollen (1990) concludes that given a lack of consensus on the best measure of fit, it is prudent to report multiple measures rather than rely on a single choice (Kline, 2011; Byrne, 2010; Hair et al., 2010; Schumacker & Lomax, 2004; Tanaka, 1993; Wheaton, 1987). Many researchers recommend using a selection of absolute, incremental and parsimonious fit indexes for measurement, structural, and overall models (Jackson et al., 2009; Chin et al., 2008; Shah & Goldstein, 2006; Fan et al., 1999; Garver & Mentzer 1999; Hu & Bentler, 1999; Bollen & Long, 1993; Bollen, 1990, 1989).

According to Hu and Bentler (1995), fit indexes quantify the degree of correspondence between a hypothesized latent variable model and the data. Hair et al. (2010, 2006) suggest depending on at least one absolute fit index; and one incremental fit index, chi-square ($\chi^2$), and the associated degrees of freedom are needed to assess overall fit. Kline (2011) suggests and advocates the use of the chi-square test, the RMSEA, the CFI and the SRMR. Boomsma (2000) makes similar recommendations but also advises that the squared multiple correlations of each equation be reported. Based on these authors' guidelines and suggestions, it is reasonable to report a variety of fit indices in this study. Fit indices derived from the three categories are described in more detail below.

**(1) Model Fit Criteria**

**Category One: Absolute fit indices**

Absolute fit indexes evaluate the degree to which the specified model fits the sample data (Kenny & McCoach, 2003; McDonald & Ho, 2002) and demonstrates which proposed model has the most superior fit. These measures provide the most fundamental indication of how well the proposed theory fits the data. The absolute fit indexes calculation does not rely on a comparison with a baseline model but is instead a measure of how well the model fits compared with no model at all (Jöreskog & Sörbom, 1993). Included in this category are the Chi-squared test ($\chi^2$), the root mean squared error of approximation (RMSEA), (Steiger, 1990), Goodness of Fit Index (GFI), (Jöreskog & Sörbom, 1982), and the Standardized Root Mean Square Residual (SRMR).

**(a) Model chi-square ($\chi$2)**

The chi-square value, is the traditional measure for evaluating overall model fit and assesses the magnitude of discrepancy between the sample and fitted covariances matrices (Iacobucci, 2010; Hu & Bentler, 1999). A low $\chi^2$ value points to a good fit because it means that the covariances predicted by the model are not significantly different from the sample covariances (Hair et al., 2010). The model chi-square should be reported along with its degrees of freedom and associated p-value (Kline, 2011; Hayduk et al., 2007).

Although the chi-square statistic provides the best inferential test of overall model fit, its usefulness is greatly undermined by the fact that it is sensitive to sample size, model complexity and non-normality (see Byrne, 2010; Hu & Bentler, 1999; Jöreskog & Sörbom, 1993; Bentler & Bonnet, 1980). Therefore, alternative goodness-of-fit measures have been

developed in descriptive measures (i.e. GFI, RMSEA, SRMR, CFI, TLI, PNFI) and it is necessary to rely on these goodness-of-fit indices to assess model fit (MacKenzie et al., 2011).

**(b) Root mean square error of approximation (RMSEA)**

RMSEA was first proposed by Steiger and Lind in 1980 and is recognized as one of the most informative criteria in covariance structure modelling (Diamantopoulos & Siguaw, 2000) due to its sensitivity to the number of estimated parameters in the model. RMSEA takes into account the error of approximation in the population and asks the question, "How well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?" (Browne & Cudeck, 1993, pp. 137-138).

MacCallum and Austin (2000) strongly urge reseachers to incorporate RMSEA in model evaluation for three reasons: (a) it would appear to be adequately sensitive to model misspecification (Hu & Bentler, 1998); (b) commonly used interpretative guidelines would appear to yield appropriate conclusions regarding model quality (Hu & Bentler, 1999, 1998); and (c) it is possible to build confidence intervals around RMSEA values (MacCallum et al., 1996). In addition, RMSEA is relatively independent of sample size, favours parsimonious models (Kaplan, 2009; Browne & Cudeck, 1993) and is not affected by the size of factor loadings (Sharma et al., 2005).

RMSEA is a 'badness-of-fit" index in that a value of zero indicates the best fit and higher values indicate a worse fit. The values $\leq 0.05$ can be considered as a good fit, values between 0.05 and 0.08 as an adequate fit, values between 0.08 and 0.10 as a mediocre fit, and values $> 0.10$ are not acceptable and indicate a poor fit (Browne & Cudeck, 1996; MacCallum et al., 1993). Even though there is general agreement that the value of RMSEA for a good model should be less than 0.05, Hu and Bentler (1999) suggest a RMSEA of less than 0.06 as a cutoff criterion (see also Ullman, 2007). One of the greatest advantages of the RMSEA is its ability to calculate a confidence interval around its value (MacCallum et al., 1996). It is generally reported in conjunction with the RMSEA and in a well-fitting model, that the lower limit be close to 0 and the upper limit should be less than 0.08 (Hooper et al., 2008; MacCallum et al., 1996).

**(c) Standardised root mean square residual (SRMR)**

The SRMR indicates the average value of the standardized residuals between observed and predicted covariances (Matsunaga, 2010). Based on a rule of thumb, SRMR should be less than 0.05 for a good fit (Diamantopoulos & Siguaw, 2000; Byrne, 1998; Hu & Bentler, 1995) whereas values less than 0.09 may be interpreted as acceptable (Hu & Bentler, 1999). SRMR will be lower when there is a high number of parameters in the model and in models based on large sample sizes (Hooper et al., 2008). According to Iacobucci (2010, p. 91), SRMR "is a pretty good indicator of whether the specified model captures the data, since it is relatively less sensitive to other issues such as violations of distributional assumptions".

**(d) Goodness-of-fit statistic (GFI)**

The Goodness-of-Fit statistic (GFI) was created by Jöreskog and Sörbom (1982) as an alternative to the chi-square test and calculates the proportion of variance accounted for by the estimated population covariance (Tabachnick & Fidell, 2007). According to Jöreskog and Sörbom (1993, p. 123), this implies testing how much better the model fits than "no model at all" (null model), i.e., when all parameters are fixed to zero. The rule of thumb for GFI is that values greater than 0.90 usually indicate an acceptable fit (Hair et al., 2010; Schumacker & Lomax, 2004; Marsh & Grayson, 1995; Bentler, 1992; Bentler & Bonett, 1980).

However, previous studies have found that the GFI is more sensitive to sample size than other indices such as NFI, NNFI, and CFI (Chin, Peterson, & Brown, 2008; Lei & Lomax, 2005; Fan, Thompson, & Wang, 1999; Marsh, Balla, & McDonald, 1988). Hu and Bentler (1998) advise against using GFI because not only is it significantly influenced by sample size but it is also insufficiently sensitive to model misspecification. According to Sharma et al. (2005), the GFI has a downward bias when there are a large number of degrees of freedom compared to sample size. Similarly, GFI has an upward bias with large samples (Miles & Shevlin, 1998; Bollen, 1990) and it also increases as the number of parameters increase (MacCallum & Hong, 1997).

Given the sensitivity of this index, it has been recommended that GFI should not be used (Sharma et al., 2005). However, given the historical importance of GFI, the index is often reported in covariance structure analyses (Hooper et al., 2008).

**Category Two: Incremental fit indices**

Incremental fit indices, also known as comparative indices (Miles & Shevlin, 2007) are indices that do not use $\chi^2$ in its raw form but compare the $\chi^2$ value to a baseline model (i.e., a hypothetical model that features no structural path, factor loading, or inter-factor correlations). For these models, the null hypothesis is that all variables are uncorrelated (McDonald & Ho, 2002). Miles and Shevlin (2007, p. 870) describe incremental fit indices as "how well is my model doing, compared with the worst model that there is?". Major incremental fit indices include the comparative fit index (CFI), (Bentler, 1990) and the Tucker-Lewis index (TLI), (Tucker & Lewis, 1973).

**(a) Comparative fit index (CFI)**

Research by Gerbing and Anderson (1992) reports that CFI is among the most stable and robust fit indices (Hu & Bentler, 1999) and provides a better estimation of model fit than many alternative indexes (Bentler, 1990). This index is included in all SEM programs and is one of the most popularly reported fit indexes because it is one of the measures least affected by sample size (Fan et al., 1999), as well as being insensitive to model complexity (Hair et al., 2010). The index was first introduced by Bentler (1990) and is an adjusted version of the Normed Fit Index (NFI) developed by Bentler and Bonett (1980). Compared with NFI, CFI takes into account sample size (Byrne, 2010) and performs well even with small sample sizes (Tabachnick & Fidell, 2007).

According to Iacobucci (2010), the CFI takes the fit of one model to the data and compares it to the fit of another model to the same data. Therefore, it captures the relative goodness-of-fit, or the fit of one's hypothesized model as an empirical increment above a simpler model (in particular, one in which no paths are estimated). As well, the CFI attempts to adjust for model complexity or parsimony. It does so by including the degrees of freedom used in the model directly into the computation (Iacobucci, 2010). A cut-off criterion of CFI $\geq 0.90$ is needed in order to ensure that misspecified models are not accepted (Byrne, 2010; Hair et al., 2010; Hu & Bentler, 1999; Bentler, 1992; Bentler & Bonett, 1980). However, a value of CFI $\geq 0.95$ is presently recognised as indicative of good model fit (Hu & Bentler, 1999).

**(b) Tucker-Lewis index (TLI)**

The TLI is actually a comparison of the normed chi-square values for the null and specified model, which to some degree takes into account model complexity (Hair et al., 2010). Consistent with CFI, values close to 0.95 (for large samples) indicate a good fit (Hu & Bentler, 1999). However, Hair et al. (2010) suggest that in a model with more than 30 observed variables and a sample size of less than 250, the acceptable cutoff value for TLI is 0.92 and above.

**Category Three: Parsimony fit indexes**

Parsimony is important in assessing model fit (Hu & Bentler, 1995; Mulaik et al., 1989) and serves as a criterion for choosing between alternative models. The indices diagnose whether model fit has been achieved by "over-fitting" the data with too many coefficients. Given two models with similar fit to the same data, a parsimony-adjusted index would generally favour the simpler model. This study selected the Parsimony Goodness-of-Fit Index (PGFI ) and Normed Chi-Square ($\chi^2$ /df) as indexes that represent this category.

**(a) Parsimony goodness-of-fit index (PGFI)**

The Parsimony Goodness-of-Fit index (PGFI), a modification of the GFI, was introduced by James, Mulaik, and Brett (1982) to address the issue of parsimony in SEM. The PGFI takes into account the complexity (i.e., number of estimated parameters) of the hypothesized model in the assessment of overall model fit (Byrne, 2010) and exerts a stronger penalty on complex models with fewer degrees of freedom (Tanaka, 1993). The PGFI ranges from between zero and one, with higher values indicating a more parsimonious fit. However, no threshold levels have been recommended for this index. Mulaik et al. (1989) note that it is possible to obtain parsimony fit indices within the 0.50 region (Hooper et al., 2008).

**(b) Normed Chi-Square ($\chi^2$/df)**

This ratio is the chi square statistic divided by the degrees of freedom ($\chi^2$/df) and is one example of a statistic that minimises the impact of sample size on the Model Chi-Square (Jöreskog & Sörbom, 1993; Wheaton et al., 1977). In AMOS output, it appears as CMIN/DF (Byrne, 2010). For a good model fit, the ratio $\chi^2$/df should be as small as possible (Hoe, 2008). Although there is no absolute standard regarding an acceptable ratio for this statistic, a ratio of between 5.0 (Wheaton et al., 1977) and 2.0 (Tabachnick & Fidell, 2007) is accepted. Kline (1998) suggests that a $\chi^2$/ d.f. ratio of 3 or less is a reasonably good indicator of model fit.

Table 4.5 summarises the recommended thresholds for the model-fit-indices used in this study.

**Table 4.5 : Summary of Goodness-of-Fit-Indices**

| Fit Indices | Level of acceptance | Source |
|---|---|---|
| **Absolute Index** | | |
| Chi-square ($\chi^2$) | $\rho > 0.05$ | Hair et al., 2010; Iacobucci, 2010 |
| RMSEA | Between 0.05 and 0.08 | Hu & Bentler, 1998; MacCallum et al., 1996; Browne & Cudeck, 1993; Steiger, 1989 |
| SRMR | Less than 0.09 | Kline, 2005; Bollen & Ting, 2000; Hu & Bentler, 1999 |
| GFI | 0.90 or greater | Hair et al., 2010; Schumacker & Lomax, 2004; Bentler, 1992; Bentler & Bonett, 1980 |
| **Incremental fit indices** | | |
| CFI | 0.90 or greater | Byrne, 2010; Hair et al., 2010; Hu & Bentler, 1999; Bentler, 1992; Bentler & Bonett, 1980 |
| TLI | 0.92 or greater | Hair et al., 2010 |
| **Parsimonious fit indices** | | |
| $\chi^2$/df | $1.0 \leq \chi^2/df \leq 5$ | Tabachnick & Fidell, 2007; Kline, 1998; Wheaton et al, 1977 |
| PGFI | 0.50 or greater | Byrne, 2010; Hair et al., 2010; Mulaik et al., 1989 |

These indices have been chosen because they are most insensitive to sample size, model misspecification and parameter estimates (Hooper et al., 2008) except for GFI and Chi-square, which are biased to sample size (Byrne, 2010; Chin et al., 2008; Sharma et al., 2005; Hu & Bentler, 1998; Marsh et al., 1988; Bentler & Bonnet, 1980). Furthermore, these indices generally have performed well in Monte Carlo studies (i.e., Fan et al., 1999; Hu & Bentler, 1999) and are heavily used in marketing research to evaluate models in which the three categories are reflected.

It is observed that some of these measures will indicate an acceptable model fit while others will contradict the result. According to Narayan, Rajendran, and Prakash Sai (2008), if a majority of the fit indices indicate a good fit, then it can be considered that the proposed model has an acceptable overall model fit. Additionally, a cutoff value close to 0.95 for CFI, 0.08 for SRMR, and 0.06 for RMSEA is indicative of a good fitting model. The results can be

interpreted as evidence in favour of the validity of the hypothesized model (McKenzie et al. 2011).

**(2) Individual Parameters of the Model**

Jackson et al. (2009) mention that, apart from global fit measures, other aspects such as examining the standardized residuals and parameter estimates are important to ensure all individual parameters are meaningful (Kaplan, 2009). This study examined the individual parameters in the model following Schumacker and Lomax's (2004) suggestions. Accordingly, three main features can be considered. The first feature is whether a free parameter (i.e., parameter estimate, standard error) is significantly different from zero. The statistical significance of individual parameter estimates is referred to as a t-value or a critical value (i.e., computed by dividing the parameter estimates by their respective standard errors) and is typically compared to a tabled t-value of 1.96 at the 0.05 significance level. In AMOS, all this information (free parameters) plus critical values are available in the output. The second feature is whether the sign of the parameter agrees with what is expected from the theoretical model (Boomsma, 2000). Finally, the third feature is that parameter estimates should make sense; that is, they should be within an expected range of values. For instance, variances should not have negative values and correlations should not exceed 1, as well as standard errors of the parameter estimates being a reasonable size (Marsh & Grayson, 1995). Thus, all free parameters should be in the expected direction, be statistically different from zero, and make practical sense.

- **Step 5: Model Modification**

The final step in SEM is to consider changes in a specified model that has poor model fit indices; that is, model modification or respecification. If the hypothesized structural model has model fit indices that are less than satisfactory, a researcher typically performs a specification search to find a better fitting model to the sample variance-covariance matrix (Schumacker & Lomax, 2004). Respecification is common in the social sciences because a priori models often do not adequately fit the data (Shook, Ketchen, Hult, & Kacmar, 2004) but any respecifications should be based on theory and content considerations to avoid exploiting sampling error to achieve satisfactory goodness-of-fit (Hair et al., 2010; Jackson et al., 2009; McDonald & Ho, 2002; Baumgartner & Homburg,

1996; Anderson & Gerbing, 1988). For the less satisfied model, this study employed several strategies in order to diagnose and respecify the model:

(a) comparing the *t* statistic for each parameter to a tabled t-value (e.g., $t > 1.96$) to determine statistical significance. Parameters that produce t-values lower than 1.96 and low factor loadings (< 0.50) are candidates for elimination (Byrne, 2010; Chin et al., 2008; Bentler & Chou, 1987).

(b) examining the standardized residual outputs, because "residuals are the individual differences between observed covariance terms and the fitted (estimated) covariance terms" and can occur either in negative or positive forms (Hair et al., 2010, p. 681). Standardized residuals of more than a 2.58 critical value indicate that a particular relationship is not well accounted for (Janssens et al., 2008; Schumacker & Lomax, 2004; Jöreskog & Sörbom, 1982) whereas residuals greater than 4.0 suggest a potentially unacceptable degree of error (Hair et al., 2010).

(c) inspecting the modification index (MI) that estimates how much chi-square is expected to decrease if its corresponding parameter is set free and the model is reestimated (Chau, 1997). The expected parameter change statistic (EPC) was also used with the MI. The EPC shows the approximate value of the new parameter (Schumacker & Lomax, 2004). A MI greater than 3.84 and large expected change estimates of EPC are candidates for elimination, provided that all essential aspects of the construct domain are captured by the remaining items (McKenzie, 2011). Byrne (2010, p. 108) states that "...large MIs argue for the presence of factor cross-loadings (i.e., a loading on more than one factor) and error covariances, respectively".

Most importantly in this study, is that model modification is not only based on statistical principles, but is also guided by careful consideration that is theoretically meaningful (Kline, 2011; Hair et al., 2010; Jackson et al., 2009; Chin et al., 2008; Worthington & Whittaker, 2006; Baumgartner & Homburg, 1996; Bentler & Chou, 1987). As well, in the process of model modification, subsequent changes are preferably made one at a time since dropping one indicator or a measure may simultaneously affect other parts of the model (Boomsma, 2000; Segars & Grovers, 1993).

#### 4.3.4.6 Unidimensionality Analysis

Before examining construct validity and reliability, unidimensionality was assessed (Hair et al., 1995). This is to minimise the possibility of misspecification (Gerbing & Anderson, 1988) since analysis of reliability and validity is based on the assumption of unidimensionality (Nunnally & Bernstein, 1994). Unidimensional is defined as "a set of measured variables (indicators) that can be explained by only one underlying construct" (Hair et al., 2010, p. 666) and is important when more than two constructs are involved.

In this study, CFA was conducted on measurement models for each construct to test for unidimensionality (Al-Hawari, 2011; Bollen, 1989; Anderson & Gerbing, 1988). A comparative fit index (CFI) of 0.9 or above for the model implies that there is strong evidence of unidimensionality of the constructs (Sureshchandar et al., 2001; Kline, 1998).

#### 4.3.4.7 Construct Validity and Reliability of the Measurement

Construct validity is "the extent to which a set of measured items actually reflects the theoretical latent construct those items are designed to measure" (Hair et al., 2010, p. 678). It also concerns the degree to which a construct achieves empirical and theoretical meaning (Peter, 1981; Bagozzi, 1980). Additionally, construct validity is a necessary prerequisite for theory development and testing (Jarvis et al., 2003; Steenkamp & Van Trijp, 1991; Bagozzi, 1980). In this study, construct validity of an instrument was tested in terms of content validity, face validity, and convergent and discriminant validity (Straub, 1989), following a similar approach to previous studies (Clemes et al., 2014, 2011; Lin & Lee, 2004; Ryu et al., 2003; Bock & Kim, 2002). Content validity and face validity were discussed in Section 4.1.4; convergent and discriminant validity are further discussed below.

**Convergent Validity**

Convergent validity refers to the degree to which multiple attempts to measure the same concept by maximally different methods agree (Campbell & Fiske 1959). The items that are the indicators of a specific construct should converge or share a high proportion of variance in common (Hair et al., 2010). Several ways were employed in this study to test convergent validity using CFA (Hair et al., 2010; Straub, 1989; Fornell & Larcker, 1981) and are as follows:

a. *Factor loadings:* a good rule of thumb is that standardized factor loading estimates should be 0.5 or higher, and ideally 0.7 or higher (Hair et al., 2010). Factor loadings higher than 0.5 demonstrate that convergent validity exists because each item contributes to forming

only the dimension that it corresponds to, and further indicates that they converge on a common point, the latent construct (Hair et al., 2010; Moliner, Sanchez, Rodriguez & Callarisa, 2007; Roig et al., 2006). Kline (2011) suggest that convergent validity is attained if all factor laodings of items on their constructs are significant and have item squared multiple correlations (SMCs) or multiple R-squares greater than 0.2.

b. *Average Variance Extracted (AVE):* indicates the amount of variance captured by a construct compared with the variance caused by measurement error (Segars, 1997; Fornell & Larcker, 1981). The AVE can be calculated by averaging the squared completely standardized factor loadings for the indicators, or by averaging the squared multiple correlations for the indicators (Fornell & Larcker, 1981). An AVE of 0.5 or higher is a good rule of thumb and suggests that the constructs have captured a relatively high level of variance and also suggests adequate convergence (MacKenzie et al., 2011; Hair et al., 2010; Segars, 1997; Bagozzi & Yi, 1988; Fornell & Larcker, 1981). Conversely, if AVE is less than 0.5, it shows that more error remains in the items than variance, as explained by the latent factor structure imposed on the measure (Hair et al., 2010).

c. *Reliability*: as discussed in Section 4.1.7, this study used Cronbach's alpha to estimate the internal consistency reliability of the measures (Nunnally, 1978; Cronbach, 1951). Additionally, construct reliability (CR) was assessed. It is a measure of the internal consistency of the construct indicators, depicting the degree to which they indicate the common latent construct. A commonly acceptable cut-off value is 0.70, which indicates good reliability (Nunnally & Bernstein, 1994; Nunnally, 1978). However, a CR between 0.6 and 0.7 is also acceptable provided that other indicators of a model's construct validity (i.e. factor loadings and AVE) are good. "High construct reliability indicates that internal consistency exists, meaning that the measures all consistently represent the same latent construct", (Hair et al., 2010, p. 679).

The calculations for AVE and CR were performed manually using the equation in Appendix 4 (Janssens et al., 2008).

**Discriminant Validity**

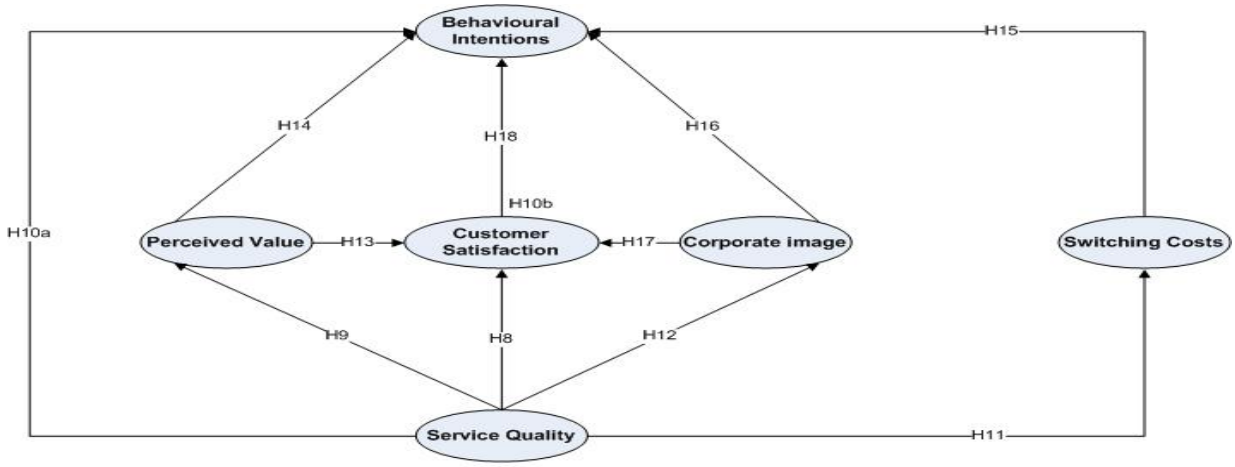
The establishment of discriminant validity is crucial for conducting latent variable analysis (Bollen, 1989; Fornell & Larcker, 1981). Discriminant validity is the degree to which a concept differs from other concepts (Churchill, 1999; Campbell & Fiske, 1959). Discriminant validity between two constructs is demonstrated if the average variance extracted is greater than the squared correlation between the constructs (Fornell & Larcker, 1981). The square root of average variance extracted (AVE) for each construct is compared with correlations between the construct and other constructs. If the square root of AVE for each construct is greater than the correlations, it indicates discriminant validity (Bhattacherjee, 2002; Segars, 1997; Fornell & Larcker, 1981). The alternative is using CFA; if estimated correlations between the factors are not excessively high (e.g., < .85 in absolute value), the constructs are said to be distinct, which indicates discriminant validity (Kline, 2011; Kline, 2005).

#### 4.3.4.8 Structural Model

A structural model is a theoretical model representing the composite of a measurement model and a path model (Reisinger & Mavondo, 2007; McDonald & Ho, 2002). Likewise, a structural model is nested within the measurement model (Bentler, 2000; Bollen, 2000; Mulaik & Millsap, 2000; Anderson & Gerbing, 1992; Fornell & Yi, 1992). The model specifies certain relationships among latent constructs (i.e., the direct and indirect relations) depicted by the direction of the arrows (dependent and independent constructs) as posited by underlying theories (Kline, 2011; Hair et al., 2010; Schumacker et al., 2004, Chau, 1997). Basically, this stage of analysis involves the evaluation of the relationships or linkages between the latent constructs that reflect the hypotheses (see Section 3.2.3).

Figure 4.10 displays the theoretical paths specified for this study, i.e., the relationships between service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions.

**Figure 4.10: The Structural Model for Behavioural Intentions**




The structural model was formed after all the measurement models were confirmed. The theoretical structural model was tested to determine the extent to which the a priori hypothesized relationships are supported by the sample variance-covariance data (Schumacker et al., 2004) as well as the significance and direction of the hypothesized paths (Hair et al., 2010). Hair et al. claim that "...if the model shows good fit, and if the hypothesized paths are significant and in the direction hypothesized, then the model is supported" (2010, p.703). Accordingly, a similar set of model-fit-indices (see Table 4.5) as used to examine the measurement model was also used to assess the model-fit-indices for the structural model (Hair et al., 2010; Bagozzi & Yi, 1988). With regard to the hypothesized paths, the model is significant when the t-value (critical ratio) is >1.96.

#### 4.3.4.8.1 *The Mediation Effect*

According to Hair et al. (2010), a mediating effect or indirect effect is created when a third construct intervenes between two other related constructs. Hypothesis H10b proposes an indirect effect of service quality on behavioural intentions through satisfaction. This study follows Baron and Kenny's (1986) procedure and SEM is used as an analytical approach to testing the mediating effects (Iacobucci, 2010). To establish the existence of mediation, four conditions should hold: (1) the predictor variable (PV) should significantly influence the mediator variable (M); (2) the mediator variable should significantly influence the dependent variable (DV); (3) the predictor variable should significantly influence the dependent variable; and (4) after controlling for the mediator variable, the impact of the predictor on the dependent variable must be insignificant or be reduced (Baron & Kenny, 1986).

There are two main types of mediation: (1) partial and (2) full or complete. Partial mediation means that both the direct and indirect effects from the predictor variable (PV) on the dependent variable (DV) are significant once the role of the mediator is accounted for in the process (Holbert & Stephenson, 2003). Full or complete mediation means the relationship between a predictor and a dependent variable becomes insignificant when the mediator is added (Hair et al., 2010). Based on SEM, the mediation role of the M construct is supported when the sequence P→M→DV provides a good fit. If the addition of the P→DV path improves the fit of the model significantly, as indicated by the $\Delta\chi^2$, complete mediation is not supported. However, if the two models produce similar $\chi^2$, this indicates that mediation is supported (Hair et al., 2010).

### 4.4 Summary

This chapter has discussed the methodology used to satisfy the three research objectives outlined in Section 1.4. Firstly the research design, such as construct operationalization, focus group procedures, questionnaire design, measurement validity and reliability, and pre-testing procedures, was reviewed. The sampling method was then reviewed followed by a discussion about the data collection procedure (i.e., the mall-intercept approach, convenience sampling, self-administered questionnaire). The final section discussed the statistical analysis procedures involving EFA and SEM.

# Chapter 5
# Data Analysis and Result

This chapter presents the results of the data analysis and hypothesis testing based on the research methodology discussed in Chapter 4. The discussion starts with an explanation of the sample and usable responses, followed by data screening (i.e., missing data, outliers and normality tests). Next, the sample characteristics and descriptive analysis results are presented. The data set for the service quality measurement scale is then examined to ensure its appropriateness for EFA. The results of the EFA and SEM analyses are presented in the subsequent sections with the illustrated model incorporated.

## 5.1 The Sample and Usable Responses

The survey was carried out from 1–31 October, 2011 in various selected shopping mall complexes in the Klang Valley in Malaysia. A total of 544 self-administered questionnaires were distributed and returned. However, 23 questionnaires were excluded from analysis because they were over 25% incomplete (Sekaran, 2005). Therefore, 521 usable questionnaires were valid for further analysis, i.e., data screening, a response rate of 96%. For most studies, Babbie (2014) advises that a response rate of at least 50% is adequate for analysis and reporting, 60% is good, and 70% or more is very good. The total of 521 usable questionnaires is adequate for this study because there are over 440 usable questionnaires (i.e., the required minimum sample size needed for this study) (see Section 4.2.1).

## 5.2 Data Screening

### 5.2.1 Missing Data

Screening of the data in SPSS showed that there was no missing data. This is because the 23 incomplete questionnaires were excluded from the analysis. All 521 usable questionnaires were free from missing data and therefore could be tested for outliers and normality.

### 5.2.2 Outliers

Sixteen cases were identified in the data set as univariate outliers based on standardized value (*Z*-scores) less than -4 or greater than +4 (Hair et al., 2010). These cases were extreme, either

strongly agreeing or disagreeing with the interval scaled statements. Simultaneously, for multivariate outliers, based on the Mahalanobis $d^2$ test (Kline, 2011), 14 cases that had p1 and p2 less than 0.05 were deleted. Other cases that had p1 and p2 less than 0.05 were retained. Several reseachers agree that it is possible for outliers to occur and these outliers should be retained because excluding these extreme cases will affect the generalizability to the entire population and the loss of observations will occur and hence, information and model power will be lost (Anderson et al., 2009; Gao et al., 2008; Tabachnick & Fidell 2007; Hair et al., 1998). Therefore, only 30 cases were classified as outliers and excluded from the database. After this initial preparation of the data, 491 cases remained for subsequent analysis.

### 5.2.3 Normality Test

After deletion of the univariate outliers, univariate normality was checked. The results show that for univariate normality, skewness and kurtosis were satisfactorily within the range of criteria for normality. No observed variables had *Z*-skewness scores of greater than 3.0 and none had a kurtosis index of greater than 8.0 (Kline, 2011; Chou & Bentler 1995; West, Finch, & Curran, 1995; Hu et al., 1992). The maximum absolute values of skewness and kurtosis were 0.631 and 1.070 respectively (see Appendix 5). These figures indicate that univariate normality was satisfied.

For multivariate normality, the structural model shows that most of their *Z*-scores (critical ratio) are between +2.58 (significant level at $p < 1\%$) and +1.96 (significant level at $p < 5\%$) (see Appendix 6) (Hair et al., 2010). The value for multivariate kurtosis in the overall sample ($N$=491) was 198.896 and dropped to 56.530 in the second subsample ($N$=251)[23]. The value of 56.530 is acceptable as more than three constructs are involved. Hence it was safe to assume that multivariate normality generally existed (Awang, 2012). Most importantly, since maximum likelihood (ML) estimation was applied in this study, a mild departure from multivariate normality is assumed to be acceptable. This is because ML estimation is relatively robust and performs well against departures from multivariate normality, and has little effect on the standard errors and parameter estimates (Tabachnick & Fidell, 2007; Diamantopoulos, 1994; Hu et al., 1992; Chou, Bentler, & Satorra, 1991; Anderson & Gerbing, 1988).

[23] Second subsample was subjected to SEM

### 5.3 Sample Characteristics

The demographic characteristics of the sample and the number of years with the bank are presented in Tables 5.1 and 5.4, respectively. All the information was from Section E of the questionnaire.

**Table 5.1: The Profile of the Bank Questionnaire Respondent (*N*=491)**

| Variable | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Gender | Male | 234 | 47.7 |
| | Female | 257 | 52.3 |
| Age | 18-25 years | 154 | 31.4 |
| | 26-35 years | 137 | 27.9 |
| | 36-45 years | 137 | 27.9 |
| | 46-55 years | 47 | 9.6 |
| | 56-65 years | 14 | 2.9 |
| | More than 66 years | 2 | 0.4 |
| Occupation | Sales | 14 | 2.9 |
| | Business owners | 43 | 8.8 |
| | Students | 156 | 31.8 |
| | Executives | 106 | 21.6 |
| | Managers | 39 | 7.9 |
| | Professionals | 69 | 14.0 |
| | Others | 64 | 13.0 |
| Monthly Income | Less than RM2,000 | 169 | 34.4 |
| | RM2,000-RM3,999 | 112 | 22.8 |
| | RM4,000-RM5,999 | 107 | 21.8 |
| | RM6,000-RM7,999 | 48 | 9.8 |
| | RM8,000-RM9,999 | 22 | 4.5 |
| | More than RM10,000 | 33 | 6.7 |

The results in Table 5.1 show that the percentages of male and female respondents are almost equal, 52.3% being female and 47.7% being male. Most respondents (87.2%) belong to the 18-45 years age group. The largest group of respondents were students (31.8%), followed by executives (21.6%), professionals (14%) and others (13%). Fewest respondents were business owners (8.8%), managers (7.9%) and in sales (2.9%). Students encompass a high proportion in the sample due to two reasons. Firstly, the survey was conducted in a shopping mall and many of the shoppers are students. The study by Ahmed, Ghingold, and

Dahari (2007) found that post-secondary students in the Klang Valley of Malaysia were frequent and long-staying visitors to shopping malls, typically visiting six stores per 2.5 hour of mall visits. Ahmed et al. (2007) reported that shopping malls are the major spending destinations for Malaysian students. Secondly, a number of shopping complexes that were selected for the survey were located in close proximity to a university.

Almossawi (2001) notes that the student market is a large and important market segment for financial services. The increasing levels of competition in the Malaysian market for financial services have increased the need for retail banks to identify and attract new market segments (Mokhlis, Salleh, & Nik Mat, 2009). University or college students became a focus of attention in the bank market both as a source of new accounts and future profitability (Narteh & Owusu-Frimpong, 2011; Mokhlis, Salleh, & Nik Mat, 2009). In fact, many studies have investigated the behavior of this target group (Matzler, Würtele, & Renzl, 2006; Almossawi, 2001).

However, students are more likely to switch banks than other groups as they normally have a limited asset base (Clemes et al., 2010). Therefore, a one-way ANOVA[24] test was conducted to determine whether students perceive switching costs any differently than the rest of the sample.

**Table 5.2: One-way ANOVA**

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 12.361 | 6 | 2.060 | 2.168 | 0.045 |
| Within Groups | 459.871 | 484 | 0.950 | | |
| Total | 472.231 | 490 | | | |

Hair et al. (2010) stated that ANOVA is used to determine, whether the samples are from populations with equal means and are appropriate when the number of groups is two or more. In this study, there are seven occupational groups: executives, managers, professionals, sales, business owners, students and others. Table 5.2 shows the p-value of one-way ANOVA is 0.045 which indicates that there is a significant difference among groups as the p-value is less than 0.05. However, the Turkey post-hoc test further revealed that all the seven groups of occupation are grouped together (refer to Table 5.3). The results suggest that there are no statistically significant mean differences appeared among the seven groups. Therefore it can

[24] Student's t-test also can be used as an alternative method to check mean differences between two groups.

be concluded that the students do not perceive switching costs any differently than the rest of sample.

**Table 5.3 : Post Hoc Tests (Tukey HSD)**

| Occupation | N | Subset for alpha = 0.05 |
|---|---|---|
| | | 1 |
| Others | 64 | 4.7005 |
| Executive | 106 | 4.7296 |
| Business owner | 43 | 4.7636 |
| Manager | 39 | 4.7949 |
| Professional | 69 | 4.8961 |
| Students | 156 | 5.0769 |
| Sales | 14 | 5.1429 |
| Sig. | | 0.365 |

Means for groups in homogeneous subsets are displayed.

Over 70% of the respondents had an income of less than RM5,999 whereas only 6.7% had an income over RM10,000. The other 14.3% belong to the income range RM6,000-RM9,999. Most respondents (73.4%) had been with the bank for ten years or less. The longest time as a customer with a bank was 40 years (0.4%) (see Table 5.4).

**Table 5.4 : Respondents' Number of Years with their Bank**

| Category (years) | Frequency | Percentage (%) | Category (years) | Frequency | Percentage (%) |
|---|---|---|---|---|---|
| 1 | 44 | 9.0 | 15 | 24 | 4.9 |
| 2 | 46 | 9.4 | 16 | 7 | 1.4 |
| 3 | 50 | 10.2 | 17 | 7 | 1.4 |
| 4 | 30 | 6.1 | 18 | 12 | 2.4 |
| 5 | 47 | 9.6 | 20 | 9 | 1.8 |
| 6 | 31 | 6.3 | 21 | 5 | 1.0 |
| 7 | 28 | 5.7 | 22 | 3 | 0.6 |
| 8 | 26 | 5.3 | 23 | 4 | 0.8 |
| 9 | 10 | 2.0 | 25 | 3 | 0.6 |
| 10 | 48 | 9.8 | 30 | 3 | 0.6 |
| 11 | 15 | 3.1 | 31 | 2 | 0.4 |
| 12 | 14 | 2.9 | 35 | 1 | 0.2 |
| 13 | 11 | 2.2 | 40 | 2 | 0.4 |
| 14 | 9 | 1.8 | | | |

## 5.4 Descriptive Statistics

The descriptive analysis comprises the mean and standard deviation for each item of the service quality dimensions: service quality, customer satisfaction, perceived value, corporate image, switching costs and behavioural intentions. All results presented in Tables 5.5 to 5.14 are based on a seven-point Likert-type scale: 1 = strongly disagree to 7 = strongly agree.

### 5.4.1 Service Quality Dimension

#### 5.4.1.1 Primary Dimensions

Table 5.5 summarises the means and standard deviations of service quality's primary dimensions. The lowest mean is 4.86 and the highest is 5.03; the standard deviations range from 0.911 to 1.163. On average, the means of the primary dimensions' measured items are above the midpoint of the scale (mean = 4.96, standard deviation = 1.046). This demonstrates that on average, most bank customers agree with the positive statements about the primary dimensions of service quality for the retail banks represented in the sample.

**Table 5.5: The Means and Standard Deviations of the Primary Dimensions of Service Quality**

| Item | Min | Max | Mean | Standard Deviation | Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|---|---|---|---|---|
| Aall1 | 1 | 7 | 4.86 | 1.156 | Ball3 | 1 | 7 | 4.93 | 1.090 |
| Aall2 | 2 | 7 | 4.97 | 1.031 | Ball4 | 1 | 7 | 5.03 | 1.047 |
| Aall3 | 1 | 7 | 4.97 | 1.051 | Call1 | 1 | 7 | 4.94 | 1.000 |
| Aall4 | 1 | 7 | 5.01 | 1.056 | Call2 | 2 | 7 | 5.00 | 0.923 |
| Ball1 | 2 | 7 | 4.99 | 1.083 | Call3 | 2 | 7 | 5.00 | 0.911 |
| Ball2 | 1 | 7 | 4.90 | 1.163 | | | | | |

##### 5.4.1.1.1 *Interaction Quality*

Table 5.6 shows that the means of the measured items for interaction quality range from 4.70 to 5.21, and the standard deviations range from 0.943 to 1.210. On average, the means of the interaction quality measured items are above the scale midpoint (mean = 4.95, standard deviation = 1.051). This suggests that on average, bank customers agree with the positive statements about the level of the interaction quality with their retail bank.

**Table 5.6: The Means and Standard Deviations of the Measured Items of Interaction Quality**

| Item | Min | Max | Mean | Standard Deviation | Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|---|---|---|---|---|
| Aatt1 | 1 | 7 | 4.97 | 1.124 | Aex5 | 1 | 7 | 5.00 | 1.003 |
| Aatt2 | 1 | 7 | 4.99 | 1.086 | Aex6 | 2 | 7 | 5.05 | 0.954 |
| Aatt3 | 2 | 7 | 5.16 | 1.024 | Aprb1 | 2 | 7 | 4.98 | 1.024 |
| Aatt4 | 1 | 7 | 5.01 | 1.070 | Aprb2 | 2 | 7 | 5.00 | 1.038 |
| Aatt5 | 1 | 7 | 5.21 | 1.044 | Aprb3 | 2 | 7 | 4.92 | 1.012 |
| Abe1 | 1 | 7 | 5.10 | 1.098 | Aprb4 | 1 | 7 | 4.86 | 1.048 |
| Abe2 | 2 | 7 | 4.93 | 1.016 | Aprb5 | 1 | 7 | 4.96 | 1.115 |
| Abe3 | 1 | 7 | 5.04 | 1.054 | Ainfo1 | 1 | 7 | 4.71 | 1.186 |
| Abe4 | 1 | 7 | 5.02 | 1.068 | Ainfo2 | 1 | 7 | 4.70 | 1.210 |
| Abe5 | 2 | 7 | 4.99 | 1.007 | Ainfo3 | 1 | 7 | 4.83 | 1.064 |
| Abe6 | 1 | 7 | 4.95 | 1.040 | Ainfo4 | 2 | 7 | 4.87 | 1.039 |
| Aex1 | 2 | 7 | 4.92 | 1.003 | Ainfo5 | 1 | 7 | 4.88 | 1.119 |
| Aex2 | 2 | 7 | 4.95 | 0.945 | Ainfo6 | 1 | 7 | 4.80 | 1.108 |
| Aex3 | 2 | 7 | 4.92 | 0.951 | Ainfo7 | 1 | 7 | 4.82 | 1.079 |
| Aex4 | 2 | 7 | 4.95 | 0.943 | | | | | |

#### 5.4.1.1.2 *Physical Environment Quality*

Table 5.7 summarises the means and standard deviations of physical environment quality. The lowest mean is 4.72 and the highest is 5.34; the standard deviations range from 1.004 to 1.229.

**Table 5.7: The Means and Standard Deviations of the Measured Items of the Physical Environment Quality**

| Item | Min | Max | Mean | Standard Deviation | Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|---|---|---|---|---|
| Bam1 | 2 | 7 | 5.00 | 1.176 | Bphy1 | 2 | 7 | 5.09 | 1.127 |
| Bam2 | 1 | 7 | 5.01 | 1.229 | Bphy2 | 1 | 7 | 5.10 | 1.144 |
| Bam3 | 1 | 7 | 5.13 | 1.163 | Bphy3 | 1 | 7 | 5.01 | 1.180 |
| Bam4 | 2 | 7 | 5.10 | 1.055 | Bphy4 | 1 | 7 | 5.10 | 1.077 |
| Bam5 | 3 | 7 | 5.23 | 1.004 | Bphy5 | 2 | 7 | 5.21 | 1.052 |
| Beq1 | 1 | 7 | 5.12 | 1.222 | Bphy6 | 1 | 7 | 5.18 | 1.083 |
| Beq2 | 1 | 7 | 5.20 | 1.163 | Bsoc1 | 2 | 7 | 4.72 | 1.104 |
| Beq3 | 2 | 7 | 5.34 | 1.068 | Bsoc2 | 2 | 7 | 4.78 | 1.046 |
| Beq4 | 2 | 7 | 5.22 | 1.155 | Bsoc3 | 1 | 7 | 4.85 | 1.093 |
| Beq5 | 1 | 7 | 5.30 | 1.122 | Bsoc4 | 2 | 7 | 4.95 | 1.083 |
| Beq6 | 2 | 7 | 5.11 | 1.156 | | | | | |

On average, the means of the physical environment quality measured items are also above the midpoint of the scale (mean = 5.083, standard deviation = 1.119). The mean demonstrates that bank customers agree with the positive statements about the physical environment quality of their retail bank.

#### 5.4.1.1.3 *Outcome Quality*

Table 5.8 summarises the means and standard deviations of the outcome quality. The lowest mean is 4.48 and the highest is 5.54; the standard deviations range from 0.910 to 1.292. On average, the means of the outcome quality measured items are also above the midpoint of the scale (mean = 4.92, standard deviation = 1.070). This demonstrates that bank customers on average, agree with the positive statements about outcome quality with their retail bank.

**Table 5.8: The Means and Standard Deviations of the Measured Items of the Outcome Quality**

| Item | Min | Max | Mean | Standard Deviation | Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|---|---|---|---|---|
| Cwa1 | 1 | 7 | 4.50 | 1.218 | Csec3 | 1 | 7 | 4.89 | 1.125 |
| Cwa2 | 1 | 7 | 4.59 | 1.236 | Csec4 | 2 | 7 | 4.88 | 0.990 |
| Cwa3 | 1 | 7 | 4.64 | 1.146 | Csec5 | 1 | 7 | 4.90 | 1.128 |
| Cwa4 | 1 | 7 | 4.48 | 1.199 | Csec6 | 2 | 7 | 5.04 | 0.977 |
| Cwa5 | 1 | 7 | 4.72 | 1.149 | Csec7 | 2 | 7 | 4.99 | 1.005 |
| Cco1 | 1 | 7 | 5.04 | 1.082 | Crel1 | 2 | 7 | 4.75 | 1.052 |
| Cco2 | 2 | 7 | 5.13 | 1.023 | Crel2 | 2 | 7 | 4.90 | 0.979 |
| Cco3 | 2 | 7 | 5.21 | 1.067 | Crel3 | 2 | 7 | 4.95 | 0.927 |
| Cco4 | 2 | 7 | 5.30 | 1.048 | Crel4 | 1 | 7 | 4.88 | 0.910 |
| Cco5 | 2 | 7 | 5.19 | 0.977 | Crel5 | 2 | 7 | 5.00 | 0.937 |
| Cco6 | 2 | 7 | 5.54 | 1.052 | Crel6 | 1 | 7 | 4.97 | 0.961 |
| Cval1 | 2 | 7 | 4.84 | 1.106 | Csp1 | 1 | 7 | 4.91 | 1.112 |
| Cval2 | 2 | 7 | 5.00 | 1.051 | Csp2 | 2 | 7 | 4.97 | 1.059 |
| Cval3 | 2 | 7 | 4.96 | 1.037 | Csp3 | 2 | 7 | 4.97 | 1.076 |
| Csec1 | 1 | 7 | 4.71 | 1.247 | Csp4 | 2 | 7 | 4.93 | 1.016 |
| Csec2 | 1 | 7 | 4.74 | 1.292 | Csp5 | 1 | 7 | 4.89 | 1.070 |

### 5.4.2 Higher-Order Constructs

#### 5.4.2.1 Service Quality

Table 5.9 presents the five items used to measure a bank's service quality. The lowest mean is 4.96 and the highest is 5.11; the standard deviations range from 0.994 to 1.056. On

average, the means of the service quality measured items are above the midpoint of the scale (mean = 5.014, standard deviation = 1.031). This demonstrates that bank customers perceived they were receiving an acceptable level of service quality.

**Table 5.9: The Means and Standard Deviations of the Measured Items of the Service Quality Construct**

| Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|
| Dsq1 | 2 | 7 | 4.96 | 1.041 |
| Dsq2 | 2 | 7 | 5.02 | 1.023 |
| Dsq3 | 3 | 7 | 4.98 | 0.994 |
| Dsq4 | 2 | 7 | 5.00 | 1.056 |
| Dsq5 | 1 | 7 | 5.11 | 1.040 |

#### 5.4.2.2 Customer Satisfaction

Table 5.10 presents the five items used to measure customer satisfaction. The means range from 5.03 to 5.13; the standard deviations range from 0.951 to 1.029. On average, the means of the customer satisfaction measured items are above the scale midpoint (mean = 5.072, standard deviation = 0.991). The means suggest that most respondents agree with the positive statements about bank customer satisfaction. Therefore, most bank customers are satisfied with their bank's service.

**Table 5.10: The Means and Standard Deviations of the Measured Items of the Customer Satisfaction Construct**

| Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|
| Dcs1 | 2 | 7 | 5.13 | 1.029 |
| Dcs2 | 2 | 7 | 5.11 | 0.951 |
| Dcs3 | 2 | 7 | 5.05 | 0.952 |
| Dcs4 | 2 | 7 | 5.03 | 1.026 |
| Dcs5 | 2 | 7 | 5.04 | 0.996 |

#### 5.4.2.3 Perceived Value

Table 5.11 presents the five items used to measure a bank's perceived value. The means range from 4.28 to 4.71; the standard deviations range from 1.018 to 1.226. On average, the means of the perceived value measured items are within the scale midpoint (mean = 4.444, standard deviation = 1.145). This demonstrates that bank customers had a neutral perception with respect to the perceived value statements asked in this study.

**Table 5.11: The Means and Standard Deviations of the Measured Items of the Perceived Value Construct**

| Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|
| Dpv1 | 1 | 7 | 4.28 | 1.226 |
| Dpv2 | 1 | 7 | 4.35 | 1.221 |
| Dpv3 | 1 | 7 | 4.37 | 1.204 |
| Dpv4 | 1 | 7 | 4.51 | 1.056 |
| Dpv5 | 2 | 7 | 4.71 | 1.018 |

#### 5.4.2.4 Corporate Image

Table 5.12 presents the five items used to measure a bank's corporate image. The means range from 5.21 to 5.33; the standard deviations range from 1.023 to 1.146. On average, the means of the corporate image measured items are above the scale midpoint (mean = 5.28, standard deviation = 1.066). This suggests that most bank customers perceived the retail banks in the sample as having a favourable image.

**Table 5.12: The Means and Standard Deviations of the Measured Items of the Corporate Image Construct**

| Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|
| Dci1 | 2 | 7 | 5.32 | 1.146 |
| Dci2 | 2 | 7 | 5.33 | 1.032 |
| Dci3 | 2 | 7 | 5.26 | 1.023 |
| Dci4 | 2 | 7 | 5.21 | 1.055 |
| Dci5 | 2 | 7 | 5.28 | 1.073 |

#### 5.4.2.5 Switching Costs

Table 5.13 shows the six items used to measure a bank's switching costs. The lowest mean is 4.79 and the highest is 4.99; the standard deviations range from 1.118 to 1.172. On average, the means of the bank's switching costs' measured items are within the scale midpoint (mean = 4.88, standard deviation = 1.14). This suggests that the bank customers had a neutral perception with respect to the switching cost statements made in this study.

**Table 5.13: The Means and Standard Deviations of the Measured Items of the Switching Costs Construct**

| Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|
| Dsc1 | 1 | 7 | 4.99 | 1.118 |
| Dsc2 | 1 | 7 | 4.93 | 1.150 |
| Dsc3 | 1 | 7 | 4.88 | 1.172 |
| Dsc4 | 1 | 7 | 4.79 | 1.149 |
| Dsc5 | 1 | 7 | 4.82 | 1.134 |
| Dsc6 | 1 | 7 | 4.85 | 1.126 |

#### 5.4.2.6 Behavioural Intentions

Table 5.14 presents the means and standard deviations for the seven items used to measure behavioural intentions. The means range from 5.03 to 5.13; the standard deviations range from 0.966 to 1.066. On average, the means of the behavioural intentions measured items are above the midpoint of the scale (mean = 5.08, standard deviation = 1.020). This suggests that on average, bank customers of the retail banks represented in the sample agree with the positive behavioural intentions statements in the questionnaire.

**Table 5.14: The Means and Standard Deviations of the Measured Items of the Behavioural Intentions Construct**

| Item | Min | Max | Mean | Standard Deviation |
|---|---|---|---|---|
| Dbi1 | 2 | 7 | 5.10 | 1.015 |
| Dbi2 | 2 | 7 | 5.05 | 0.997 |
| Dbi3 | 3 | 7 | 5.09 | 0.994 |
| Dbi4 | 1 | 7 | 5.03 | 1.066 |
| Dbi5 | 2 | 7 | 5.13 | 0.966 |
| Dbi6 | 1 | 7 | 5.06 | 1.059 |
| Dbi7 | 1 | 7 | 5.10 | 1.045 |

## 5.5 Data Analysis

After data screening (see Section 5.2), the "clean" sample (i.e., 491 responses) was randomly split into two subsamples for further analysis. The size of each sample group was determined according to the minimum size requirements explained in Section 4.2.1. The first subsample, 240 responses, was subjected to EFA and the second subsample, 251 responses, was subjected to CFA and structural analysis (SEM). The results of EFA and SEM analysis are presented and discussed in the following subsections.

### 5.5.1 Exploratory Factor Analysis (EFA)

#### 5.5.1.1 Test of the Appropriateness of EFA for Interaction Quality

Initially, 29 items were proposed for measuring the five subdimensions of interaction quality: attitude, behaviour, expertise, problem solving and information. The data set was first examined to ensure its appropriateness for EFA (see Section 4.3.3.1.2). The result for the interaction quality data shows that most of the correlation matrix (see Appendix 7) is above the recommended level of 0.30 and no correlations are beyond 0.90 (Hair et al., 2010; Pallant, 2007; Tabachnick & Fidell, 2007) with small anti-image correlations (see Appendix 8) (Field, 2009; Tabachnick & Fidell, 2007).

Bartlett's Test of Sphericity ($\chi 2$ = 5914.170, df = 406, p<.000) was statistically significant at the 0.001% level, which indicates that the variables are related and therefore good candidates for structure detection (SPSS, Inc., 2010). The Kaiser-Meyer-Olkin (KMO) test result was 0.940, with values close to 1.0 being desirable (Kaiser & Rice, 1974). All the required test results were above the recommended levels indicating that the data set is adequate for EFA (Hair et al., 2010).

#### 5.5.1.2 Results of EFA for Interaction Quality

Principal components analysis (PCA) with VARIMAX rotation over the 240 responses (i.e., the first subsample) was used to extract the 29 items that had been generated for interaction quality from the focus groups and the literature review (Malhotra, 2004; Steiger, 1990). Based on the initial latent root criterion (eigenvalues), five factors had eigenvalues of greater than one that account for 72.68% of the total variance (see Table 5.15). The total explained variance was above the recommended threshold of 60% suggested by Hair et al. (2010). The screeplot (see Figure 5.1) further confirms that the extraction of five factors is appropriate for this analysis.

The results of the VARIMAX rotation (see Table 5.15) reveal that all 29 items had significant loadings above ±0.50 (Hair et al., 2010). In fact, all items loaded exactly on five factors as originally proposed, based on the literature review and the focus group discussions. Therefore, the measurement items for interaction quality used in this study exhibit adequate content validity. The factor loading values range from 0.583 to 0.806; no item highly loaded on more than one factor, indicating adequate unidimensionality (Bernard, 2000).

**Figure 5.1: The Scree Plot of Eigen Values for Interaction Quality**


The five factors are: information (seven items), expertise (five items), behaviour (six items), attitude (five items), and problem solving (five items). After identifying the factors, a reliability test was performed. Cronbach's coefficient alpha (Cronbach, 1951) was used to measure the reliability of all items. All factors had a Cronbach's coefficient alpha of greater than 0.70, the critical value suggested by Nunnally and Bernstein (1994) (see Table 5.15). The results indicate there is internal consistency of the variables in the exploratory study.

**Table 5.15: The EFA Results for the Interaction Quality Items using the VARIMAX Rotation**

| Item | Attribute | Component | | | | |
|---|---|---|---|---|---|---|
| | | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 |
| Aatt1 | The employees of the XYZ Bank are friendly. | | | | 0.785 | |
| Aatt2 | The employees of the XYZ Bank are patient. | | | | 0.761 | |
| Aatt3 | The employees of the XYZ Bank are willing to help me. | | | | 0.769 | |
| Aatt4 | The employees of the XYZ Bank are consistently courteous. | | | | 0.760 | |
| Aatt5 | The employees of the XYZ Bank have a positive attitude towards customer service. | | | | 0.769 | |
| Abe1 | The employees of the XYZ Bank greet me when it's my turn to be served. | | | 0.583 | | |
| Abe2 | The employees of the XYZ Bank give personal attention to me. | | | 0.744 | | |
| Abe3 | The XYZ Bank has employees who deal with customers in a caring manner. | | | 0.744 | | |
| Abe4 | The XYZ Bank employees understand my specific needs. | | | 0.678 | | |
| Abe5 | The behaviour of employees in the XYZ Bank instils confidence in me. | | | 0.682 | | |
| Abe6 | The XYZ Bank employees do not hesitate to find the time to serve me better. | | | 0.729 | | |
| Aex1 | The employees of the XYZ Bank have adequate knowledge about the bank's services and products. | | 0.759 | | | |
| Aex2 | The employees of the XYZ Bank are knowledgeable when answering my questions. | | 0.788 | | | |
| Aex3 | The XYZ Bank employees have the necessary knowledge to serve me promptly. | | 0.755 | | | |
| Aex4 | The employees of the XYZ Bank give clear and precise | | 0.659 | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | answers to my enquiries. | | | | | |
| Aex5 | The XYZ bank has competent employees who demonstrate the necessary banking skills. | | 0.658 | | | |
| Aex6 | The employees of the XYZ Bank are efficient in handling my transactions. | | 0.615 | | | |
| Aprb1 | The employees of the XYZ Bank have the ability to solve a problem. | | | | | 0.726 |
| Aprb2 | The employees of the XYZ Bank have shown an interest in solving problems. | | | | | 0.700 |
| Aprb3 | The employees of the XYZ Bank are dependable in handling customer service problems. | | | | | 0.712 |
| Aprb4 | The employees of the XYZ Bank have the ability to openly discuss solutions when problems arise. | | | | | 0.729 |
| Aprb5 | I do not have to visit the XYZ Bank many times to solve a particular problem. | | | | | 0.643 |
| Ainfo1 | The employees of the XYZ Bank keep me informed about matters of concern to me. | 0.709 | | | | |
| Ainfo2 | The employees of the XYZ Bank keep the client informed every time a better solution appears to a problem. | 0.806 | | | | |
| Ainfo3 | The employees of the XYZ Bank always provide clear information. | 0.720 | | | | |
| Ainfo4 | The employees of the XYZ Bank always provide accurate information. | 0.633 | | | | |
| Ainfo5 | The employees of the XYZ Bank explain their services and fees fully to the customer. | 0.761 | | | | |
| Ainfo6 | The XYZ Bank provides information when there is a new banking service. | 0.714 | | | | |
| Ainfo7 | The employees of the XYZ Bank continuously provide me with progress information when I apply for a service that needs time to be completed. | 0.772 | | | | |
| | **Eigenvalue** | 14.512 | 2.512 | 1.717 | 1.264 | 1.071 |
| | **Total Variance (%)** | 72.679 | | | | |
| | **Kaiser-Meyer-Olkin Measure of Sampling Adequacy** | 0.940 | | | | |
| | **Cronbach Alpha** | 0.916 | 0.908 | 0.921 | 0.904 | 0.930 |

### 5.5.1.3 Test of the Appropriateness of EFA for Physical Environment Quality

The test shows that most correlation matrix results for the physical environment quality data (see Appendix 9) are above the recommended level of 0.30 (Hair et al., 2010; Pallant, 2007; Tabachnick & Fidell, 2007) with low anti-image correlations (see Appendix 10) (Field, 2009; Tabachnick & Fidell, 2007). Both results indicate that the dataset shares common factors and is appropriate for EFA.

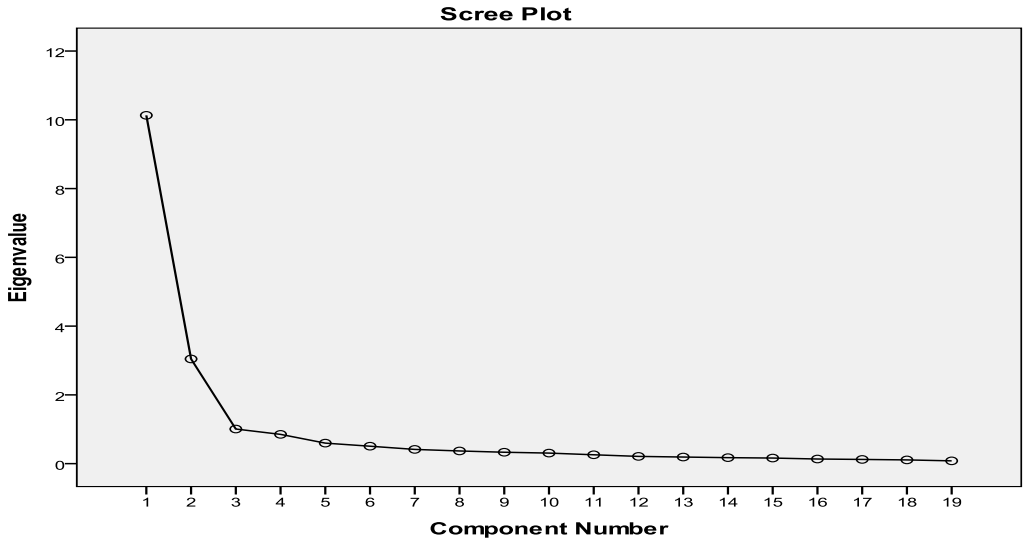
Bartlett's Test of Sphericity ($\chi 2$ = 4418.736, df = 171, p<.000) was statistically significant at the 0.001% level. The Kaiser-Meyer-Olkin (KMO) result was 0.920. A value of 0.90 or above is defined as “marvellous” by Kaiser and Rice (1974). All tests suggest that the physical environment quality dataset is appropriate for EFA (Hair et al., 2010).

#### 5.5.1.3.1 *Results of EFA for Physical Environment Quality*

All the items were extracted using PCA with VARIMAX rotation. Table 5.16 shows that the three factors initially identified based on eigenvalues of greater than one, account for

74.64% of the total variance. The scree plot further confirms that the extraction of three factors is appropriate for this analysis (see Figure 5.2).

**Figure 5.2: The Scree Plot of Eigen Values for Physical Environment Quality**




Initially, 21 items were proposed for measuring the four subdimensions of the physical environment quality: ambient conditions, equipment, physical appeal and social factors. However, only 19 items remained after two rounds of variable reduction were conducted. Two items, Bphy5 and Bphy6, were removed because of cross-loadings of greater than 0.40. This is consistent with Hair et al. (2010) who suggest that items that load highly on more than one factor should be eliminated from the data set to ensure adequate unidimensionality.

The 19 items that loaded on three factors as shown in Table 5.16, change the originally proposed four factors. This is because all the items for ambient conditions (five items) and equipment (6 items) loaded on the same factor. Accordingly, adequate unidimensionality was satisfied because no item loaded on more than one factor (Bernard, 2000). The lowest factor loading is 0.682 and the highest is 0.926. The three final factors are labelled as ambient and equipment (11 items), physical appeal (four items) and social factors (four items). All items were subjected to a reliability test and, as shown in Table 5.16, the Cronbach alphas for the three factors are greater than 0.60 (i.e., 0.953, 0.941, 0.909). This result indicates internal consistency of the variables (Nunnally & Bernstein, 1994; Churchill, 1979).

**Table 5.16: The EFA Results for the Physical Environment Quality using the VARIMAX Rotation**

| Item | Attribute | Component | | |
|---|---|---|---|---|
| | | Factor 1 | Factor 2 | Factor 3 |
| Bam1 | Space in the XYZ Bank is adequate. | 0.759 | | |
| Bam2 | The XYZ Bank looks attractive from the outside. | 0.760 | | |
| Bam3 | The temperature in the XYZ Bank is comfortable. | 0.765 | | |
| Bam4 | The noise level in the XYZ Bank is reasonable. | 0.742 | | |
| Bam5 | I believe that the XYZ Bank provides a comfortable environment in which to do business. | 0.781 | | |
| Beq1 | The XYZ Bank has modern looking equipment. | 0.825 | | |
| Beq2 | The XYZ Bank has up to date equipment. | 0.766 | | |
| Beq3 | The XYZ Bank employs the latest technology in banking. | 0.746 | | |
| Beq4 | The XYZ Bank's ATM machine is easily accessible. | 0.802 | | |
| Beq5 | The XYZ Bank's ATM machine is easy to operate. | 0.747 | | |
| Beq6 | The XYZ Bank's ATM machine is always working. | 0.682 | | |
| Bphy1 | The XYZ Bank's physical facilities are attractive. | | 0.763 | |
| Bphy2 | The XYZ Bank's physical facilities are comfortable. | | 0.812 | |
| Bphy3 | The XYZ Bank has a superb layout and furniture arrangement. | | 0.825 | |
| Bphy4 | The XYZ Bank's interior design (furnishing) gives me the appearance of a quality branch. | | 0.723 | |
| Bsoc1 | The attitudes of other customers do not disturb me in the XYZ Bank. | | | 0.883 |
| Bsoc2 | The behaviour of other customers does not disturb me in the XYZ Bank. | | | 0.926 |
| Bsoc3 | I am not disturbed when other customers interact with the employees in the XYZ Bank. | | | 0.876 |
| Bsoc4 | The presence of other customers of the XYZ Bank does not affect its ability to provide me with good service. | | | 0.839 |
| | **Eigenvalue** | 10.130 | 3.045 | 1.007 |
| | **Total Variance (%)** | 74.638 | | |
| | **Kaiser-Meyer-Olkin Measure of Sampling Adequacy** | 0.920 | | |
| | **Cronbach's Alpha** | 0.953 | 0.941 | 0.909 |

#### 5.5.1.4 Test of the Appropriateness of EFA for Outcome Quality

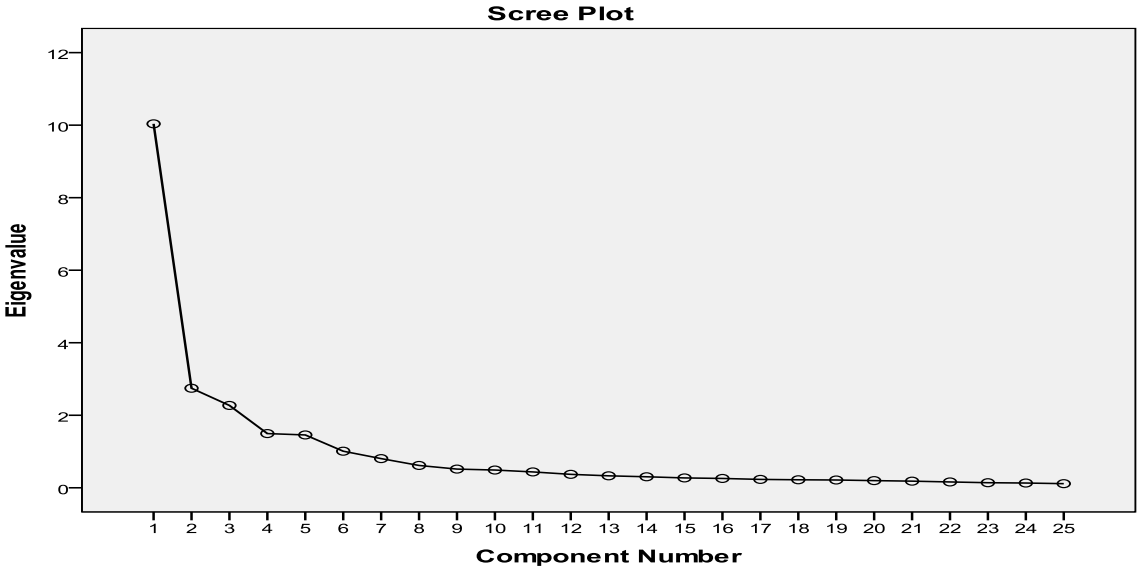
Pallant (2007) suggests factor analysis is appropriate when there are substantial numbers of correlations greater than 0.30 in a data matrix. The test reveals that most of the correlation matrix for outcome quality data (see Appendix 11) is above the recommended level of 0.30, and below 0.90 (Hair et al., 2010; Pallant, 2007; Tabachnick & Fidell, 2007) with low anti-image correlations (see Appendix 12) (Field, 2009; Tabachnick & Fidell, 2007). Both results indicate that the data shares common factors and is appropriate for EFA.

Bartlett's Test of Sphericity ($\chi 2$ = 4545.154, df = 300, p<.000) was statistically significant at the 0.001% level. The Kaiser-Meyer-Olkin (KMO) test resulted in a value of 0.903. An index value of 0.90 or above is defined as "marvellous" by Kaiser and Rice (1974). All tests suggest that the outcome quality dataset is appropriate for EFA because sufficient correlations exist among the variables (Hair et al., 2010).

#### 5.5.1.4.1 *Results of EFA for Outcome Quality*

All items were extracted using PCA with VARIMAX rotation. Table 5.17 shows that six factors initially identified based on eigenvalues of greater than one accounted for 76.05% of the total variance. The scree plot further confirms that the extraction of six factors is appropriate for this analysis (see Figure 5.3).

**Figure 5.3: The Scree Plot of Eigen Values for Outcome Quality**




From the focus group discussions and the literature review, 32 items were generated for measuring the six subdimensions of outcome quality: waiting time, convenience, valence, security and privacy, reliability, and speed of decisions and responses. However, only 25 items were retained after several rounds of variable reduction had been conducted. Six items (i.e., Cco1, Csec4, Crel2, Crel3, Crel5, Crel6) were removed because of cross-loadings greater than 0.40. This is consistent with Hair et al. (2010) study. They suggest that items that are highly loaded on more than one factor should be eliminated from a data set to ensure adequate unidimensionality. One more item (Crel1) was eliminated because the factor loading was lower than 0.50 (Tabachnick & Fidell, 2007).

The rotation results show that the 25 items loaded on the six factors (see Table 5.17). The items for "security and privacy" loaded on two separate factors and not one factor as originally proposed. Among the six items of reliability, only one item (Crel4) loaded highly on the "speed of decisions and responses" factor. The other five items of reliability were removed because of high cross-loadings and low factor loadings. The rest of the items loaded "perfectly" on the original proposed factor. Factor loadings ranged from 0.653 to 0.866; no item loaded on more than one factor, suggesting adequate unidimensionality.

The six final factors are: waiting time (five items), convenience (five items), valence (three items), security (three items), privacy (three items), and speed of decisions and response (six items). All items were subjected to a reliability test. The Cronbach alphas for the six factors are greater than 0.60 (i.e., 0.894, 0.900, 0.904, 0.877, 0.865, 0.905). This result indicates internal consistency of the variables (Nunnally & Bernstein, 1994; Churchill, 1979).

**Table 5.17: The EFA Results for the Outcome Quality using the VARIMAX Rotation**

| Item | Attribute | Component | | | | | |
|---|---|---|---|---|---|---|---|
| | | Factor 1 | Factor 2 | Factor 3 | Factor 4 | Factor 5 | Factor 6 |
| Cwa1 | I find queues in the XYZ Bank move rapidly. | | | 0.742 | | | |
| Cwa2 | I do not have to wait long to be served in the XYZ Bank. | | | 0.736 | | | |
| Cwa3 | I am able to conduct a transaction immediately or after a short waiting period in the XYZ Bank. | | | 0.812 | | | |
| Cwa4 | There are no long queues in front of ATM machines at the XYZ Bank. | | | 0.737 | | | |
| Cwa5 | The XYZ Bank provides the service at the time the service was promised. | | | 0.820 | | | |
| Cco2 | I find the XYZ Bank has convenient branch locations. | | 0.772 | | | | |
| Cco3 | It is easy to find the XYZ Bank ATMs in places other than its branches. | | 0.819 | | | | |
| Cco4 | I find a variety of transactions can be performed at the XYZ Bank ATMs. | | 0.866 | | | | |
| Cco5 | I find clear guidance and information on signs on how to use the XYZ Banks' services and facilities. | | 0.807 | | | | |
| Cco6 | The XYZ Bank offers alternative channels for transactions (e.g. e-banking, Internet banking, and phone-banking). | | 0.786 | | | | |
| Cval1 | When I leave the XYZ Bank, I usually feel I have had a good experience. | | | | | 0.863 | |
| Cval2 | I believe the XYZ Bank tries to give me a good experience. | | | | | 0.864 | |
| Cval3 | I believe the XYZ Bank knows the type of experience its customers want. | | | | | 0.743 | |
| Csec1 | I feel safe at the XYZ Banks' ATM site. | | | | | | 0.759 |
| Csec2 | I feel safe inside the XYZ Bank. | | | | | | 0.804 |
| Csec3 | The employees of the XYZ Bank respect the privacy of my financial affairs when I am standing at the counter. | | | | | | 0.683 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Csec5 | I find all transactions in the XYZ Bank are confidential. | | | | 0.802 | | |
| Csec6 | I believe the XYZ Bank is a bank that is worth trusting. | | | | 0.824 | | |
| Csec7 | The XYZ Bank offers privacy in problem solving situations. | | | | 0.848 | | |
| Crel4 | When the XYZ Bank promises to do something by a certain time it does so. | 0.653 | | | | | |
| Csp1 | The XYZ Bank responds efficiently to customer feedback. | 0.784 | | | | | |
| Csp2 | The XYZ Bank is responsive to my requests. | 0.798 | | | | | |
| Csp3 | The XYZ Bank offers a fast and efficient service. | 0.768 | | | | | |
| Csp4 | The employees of the XYZ Bank give a prompt service. | 0.706 | | | | | |
| Csp5 | The employees of the XYZ Bank are efficient in handling complaints. | 0.710 | | | | | |
| | **Eigenvalue** | 10.036 | 2.745 | 2.271 | 1.495 | 1.457 | 1.009 |
| | **Percentage of Variance (%)** | 76.050 | | | | | |
| | **Kaiser-Meyer-Olkin Measure of Sampling Adequacy** | 0.903 | | | | | |
| | **Cronbach's Alpha** | 0.894 | 0.900 | 0.904 | 0.877 | 0.865 | 0.905 |

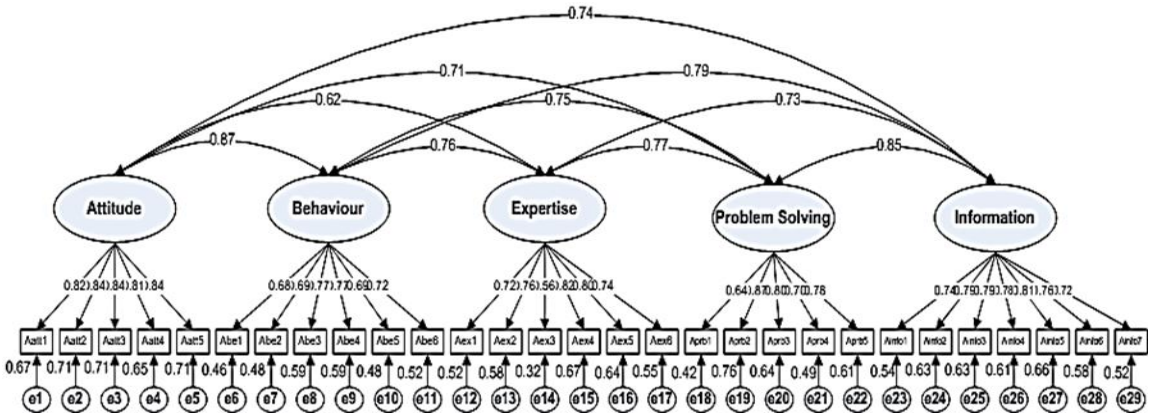
### 5.5.2 Structural Equation Modelling (SEM)

#### 5.5.2.1 The First-Order Measurement Model for the Interaction Quality of Malaysian Retail Banks

After EFA (see Section 5.5.1.1.1), the preliminary first-order measurement model was developed (see Figure 5.4) to assess the relationships between the five subdimensions of Interaction Quality: Attitude, Behaviour, Expertise, Problem Solving, and Information, together with their observed indicators. The preliminary model consists of the 29 items that generated 435 pieces of information (29 [29+1]/2 = 435); the number of estimated parameters were p = 68 parameters (24 regression weights, 10 covariances, and 34 variances) so the model was over-identified with 367 *df* (435 pieces of information - 68 parameters) (Kline, 2011; Byrne, 2010).

Figure 5.4 shows that the model was a misfit because most of the goodness-of-fit indices were beyond their recommended thresholds, i.e., chi-square was significant ($\chi^2$ =778.562, df =367, P = 0.000, *N*= 251), GFI = 0.819, and TLI = 0.908; but CFI = 0.917, RMSEA = 0.067, SRMR = 0.0463, $\chi^2$/df = 2.121, and PGFI = 0.691 indices relatively fitted. The confirmatory factor analysis (CFA) results also indicate that the coefficient correlations between constructs, i.e., Attitude and Behaviour, are higher than 0.85, suggesting a lack of discriminant validity of the constructs (Kline, 2011; Bagozzi & Yi, 1988).

**Figure 5.4: The Preliminary First-Order Model for the Interaction Quality**




$\chi^2$: 778.562, df: 367, GFI: 0.819, RMSEA: 0.067, SRMR: 0.0463, CFI: 0.917, TLI: 0.908, $\chi^2$/df: 2.121, PGFI: 0.691

The standardized factor loadings range from 0.56 to 0.84 (see Figure 5.4), all of which are well above the acceptable value of 0.50 (Bagozzi & Yi, 1988; Nunnally & Bernstein, 1994). All items are statistically siginificant at the 0.001% level, indicating unidimensionality among the items. Although the standardized parameter estimates are all significant (P<0.001), the results of the CFA suggest that the preliminary model needs to be modified. Therefore, a further modification was made.

First, the standardized residuals were assessed; the matrix shows all residual values are less than 2.58 (Janssens et al., 2008; Schumacker & Lomax, 2004). Conversely, an examination of the modification indices (MI) reveals a few items have an MI greater than 3.84 with large expected change estimates demonstrated by the expected parameter change (EPC) (MacKenzie et al., 2011). The EPC shows the approximate value of the new parameter in the model (Schumacker & Lomax, 2004). In addition to the standardized residuals and MI, the goodness-of-fit of the model, reliability and validity, and the number of items in the constructs were considered simultaneously during the process. However, above all statistical considerations, the theory and conceptual appropriateness is extremely important in model modification (Chin et al., 2008; Worthington & Whittaker, 2006; Anderson & Gerbing, 1988a; Bentler & Chou, 1987). Holmes-Smith et al. (2006, p.15) advocate that, "the researcher should guard against making changes solely based on data-driven grounds in an attempt to get a model that fits the data better".

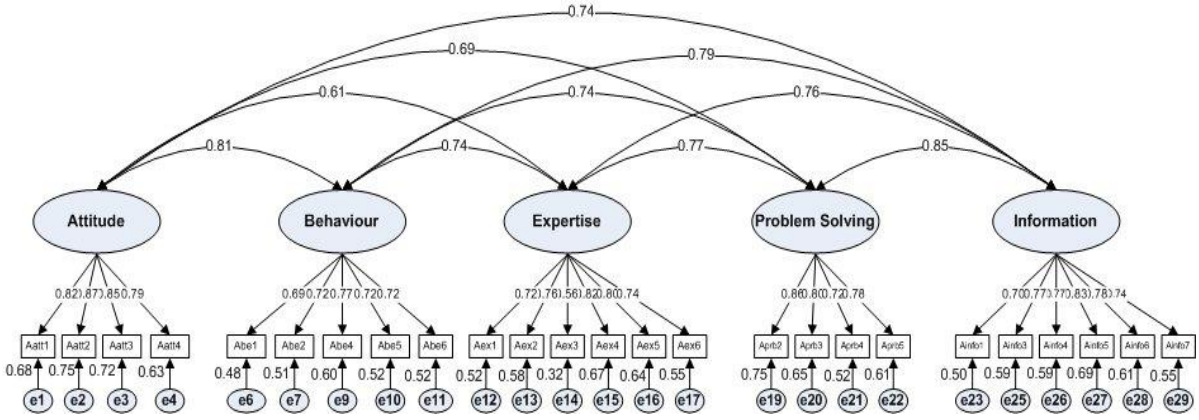
**Table 5.18: The Deleted Items for Interaction Quality**

| Item | Attribute | Reason for deletion |
|---|---|---|
| Aatt5 | The employees of the XYZ Bank have a positive attitude towards customer service. | MI: 15.045 (with Abe1) |
| Abe3 | The XYZ Bank has employees who deal with customers in a caring manner. | MI: 14.430 (with Attitudes) |
| Ainfo2 | The employees of the XYZ Bank keep the client informed every time a better solution appears to a problem. | MI: 29.485 (with Ainfo1) |
| Aprb1 | The employees of the XYZ Bank have the ability to solve a problem. | MI: 14.145 (with Ainfo3) |

*Note: MI: Modification index for error term correlation*

Accordingly, the preliminary first-order model for Interaction Quality was re-specified four times because of the unacceptably high values of MI shown in Table 5.18. The removal of these items was done one at a time, starting with item Aatt5, Abe3, Ainfo2, and then Aprb1, because dropping one item may simultaneously affect other parts of the model (Boomsma, 2000). The respecification did not significantly change the conceptualised content of the construct since the essential aspects of the construct are captured by the remaining items. Most importantly, as suggested by Hair et al. (2010), the removal of the items must not exceed a 20% deletion of the overall items of the construct. The final (modified) model shows that four to six items remain for each construct (see Figure 5.5). This is consistent with Kline's (2011) suggestion that ideally a construct should have four items and a minimum of three items.

**Figure 5.5: The Modified First-Order Model for the Interaction Quality**




$\chi^2$: 481.868, df: 265, GFI: 0.863, RMSEA: 0.057, SRMR: 0.0405, CFI: 0.946, TLI: 0.939, $\chi^2$/df: 1.506, PGFI: 0.704

The modified first-order Interaction Quality model presents 25 items generating 325 pieces of information (25 [25+1]/2 = 325) with the number of estimated parameters equal to 60 (20 regression weights, 10 covariances and 30 variances). The model was over-identified with 265 *df* (325 pieces of information - 60 parameters) (Kline, 2011; Byrne, 2010).

The modified model's standardized factor loadings are statistically significant at $p < 0.001$ and range from 0.561 to 0.865, i.e., above the acceptable value of 0.50 (see Table 5.20) (MacKenzie et al., 2011; Bagozzi & Yi, 1988). A good rule of thumb is that the standardized loading estimates should be 0.5 or higher, but ideally 0.7 or higher (Hair et al., 2010). Although two loading estimates are below 0.7 (i.e., 0.693 and 0.561) and one of those is below 0.6, these loadings do not appear to significantly harm the model fit or create an internal inconsistency (see Tables 5.19 and 5.20). In fact, the construct, Expertise, that has the 0.561 factor loading still yields a construct reliability (CR) of 0.878 and average variance extracted (AVE) of 0.548. According to Bagozzi & Yi (2012), a factor loading is acceptable if the CR is above the cut-off values.

**Table 5.19: The Improvement in the Fit of the First-Order Model for the Interaction Quality**

| | Model | GFI | RMSEA | SRMR | CFI | $\chi^2$/df | PGFI |
|---|---|---|---|---|---|---|---|
| I. | Original Model | 0.819 | 0.067 | 0.0463 | 0.917 | 2.121 | 0.691 |
| II. | Deleting Aatt5, Abe3, Ainfo2 | 0.856 | 0.060 | 0.0422 | 0.938 | 1.890 | 0.705 |
| III. | Deleting Aatt5, Abe3, Ainfo2, and Aprb1 | 0.863 | 0.057 | 0.0405 | 0.946 | 1.818 | 0.704 |

Kline (2011) suggests that items with low multiple R-squares (less than 0.20) should be removed from the analysis because this indicates very high levels of error. In this case, all the items show R-square values greater than 0.20 (see Appendix 13). Therefore all the items were retained and adequate evidence of convergent validity initially exists, given that all standardized loading estimates are more than 0.5 as well as significant (Hair et al., 2010; Anderson & Gerbing, 1988).

Based on Table 5.19, the goodness-of-fit indices were improved and most were within their recommended threshold except for the GFI. However, the GFI value (0.863) was close to the recommended 0.90 threshold so was interpreted as marginally adequate (Hair et al., 2006; Kline, 2005; Kim, 2003). This is acceptable since some researchers (see Sharma et al.,

2005; Hu & Bentler, 1998) discourage using GFI index because the GFI is more sensitive to sample size than other indices (Bagozzi & Yi, 2012; Chin et al., 2008; Lei & Lomax, 2005; Sharma et al., 2005; Fan et al., 1999; Hu & Bentler, 1998; Marsh et al., 1988).

As mentioned in Section 4.3.4.5, the GFI has a downward bias when there are many degrees of freedom (*df*) compared with sample size, and vice versa (Sharma et al., 2005). In this study, the *df* total is 265 whereas the sample size is 251, resulting in a GFI below the 0.90 threshold. The GFI can be increased by deleting more items in the model but there are other factors that need to be considered. For example, Hair et al. (2010) warn not to delete more than 20% of indicator items specified for each construct. There is a chance that the conceptualised content of the construct might be changed if more than a 20% deletion is carried out. However, several alternative goodness-of-fit measures have shown an acceptable overall model fit and relative adequacy (i.e. RMSEA = 0.057, SRMR = 0.0405, CFI = 0.946, TLI = 0.939, $\chi^2$/df = 1.506, PGFI = 0.704) (Kline, 2011; MacKenzie et al., 2011; Hair et al., 2010; Narayan et al., 2008; Kim, 2003).

Therefore, Model III is the best fitting model among the modified measurement models and is considered the ultimate first-order model for Interaction Quality (see Figure 5.5). The CFI index, 0.946, is above the recommended threshold of 0.90, indicating that the first-order CFA model for Interaction Quality exhibits strong evidence of unidimensionality (Sureshchandar et al., 2001).

Improvement in the model fit was also examined by subtracting the overall $\chi^2$ statistics for the modified model from those of the preliminary model. Comparing the preliminary model ($\chi^2_{[367]}$ = 778.562) with the modified model ($\chi^2_{[265]}$ = 481.868) yielded a difference in the $\chi^2$ value of 296.69 ($\Delta\chi^2_{[102]}$ = 296.69). Since ($\Delta\chi^2_{[102]}$ = 296.69) > $\chi^2_{126.5741,\alpha .05}$, the modified first-order model was statistically significant and improved the model-fit indices (Hair et al., 2010; Iacobucci, 2010; Jöreskog, 1993; Bentler, 1990; Bollen, 1989).

The construct validity, CR and AVE were computed to verify the convergent validity (Fornell & Larcker, 1981). The CR values for each of the five subdimensions are greater than the 0.70 cut-off value, ranging from between 0.847 and 0.901 (see Table 5.20).

**Table 5.20: The Reliability and Validity Tests of the First-Order Model for the Interaction Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Attitude | Aatt1 | 0.824*** | 0.901 | 0.694 | Problem | Aprb2 | 0.865*** | 0.872 | 0.631 |
| | Aatt2 | 0.865*** | | | Solving | Aprb3 | 0.805*** | | |
| | Aatt3 | 0.848*** | | | | Aprb4 | 0.721*** | | |
| | Aatt4 | 0.794*** | | | | Aprb5 | 0.779*** | | |
| Behaviour | Abe1 | 0.693*** | 0.847 | 0.526 | Information | Ainfo1 | 0.704*** | 0.894 | 0.586 |
| | Abe2 | 0.716*** | | | | Ainfo3 | 0.765*** | | |
| | Abe4 | 0.774*** | | | | Ainfo4 | 0.765*** | | |
| | Abe5 | 0.723*** | | | | Ainfo5 | 0.830*** | | |
| | Abe6 | 0.719*** | | | | Ainfo6 | 0.783*** | | |
| Expertise | Aex1 | 0.724*** | 0.878 | 0.548 | | Ainfo7 | 0.739*** | | |
| | Aex2 | 0.765*** | | | | | | | |
| | Aex3 | 0.561*** | | | | | | | |
| | Aex4 | 0.821*** | | | | | | | |
| | Aex5 | 0.800*** | | | | | | | |
| | Aex6 | 0.742*** | | | | | | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*
*** Statistically significant at the 0.001 level (t > 3.291)
** Statistically significant at the 0.01 level (t > 2.576)
* Statistically significant at the 0.1 level (t > 1.645)

All AVE values also exceed the minimum criterion of > 0.50, ranging between 0.526 and 0.694 suggesting that all subdimensions have captured a relatively high level of variance and adequate convergence (MacKenzie et al., 2011; Hair et al., 2010; Segars, 1997; Bagozzi & Yi, 1988; Fornell & Larcker, 1981). The CR and AVE results both signify that the reliability and validity of each subdimension are supported, therefore convergent validity is achieved (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988; Nunnally, 1978).

The CFA results also reveal that the correlation coefficient between Attitude and Behaviour improved (0.81), and is now below 0.85 as suggested by Kline, 2011. The remaining correlation estimates of all pairs of the five subdimensional factors of interaction quality were also not more than 0.85. This evidence signifies the existence of discriminant validity between the two constructs (Figure 5.5).

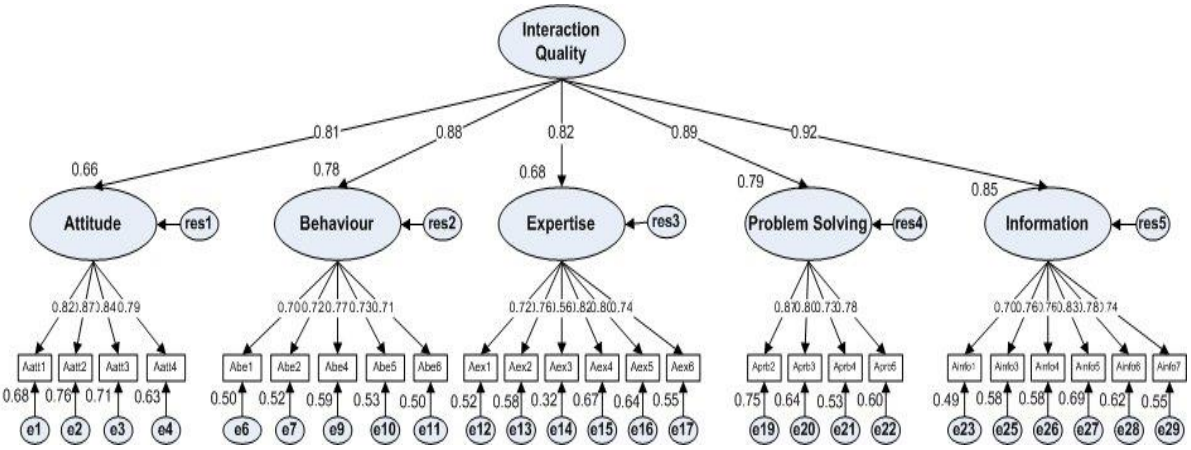
Kline (2011) suggests that if the researcher's model is reasonably correct, then one should see the following pattern of results: (1) all indicators specified to measure a common factor should have relatively high standardized factor loadings on that factor (i.e., majority >

0.70); and (2) estimated correlations between the factors should not be excessively high (i.e., < 0.90 in absolute value). The first result indicates convergent validity; the second, discriminant validity. The final modified first-order Interaction Quality model (Model III) satisfactorily met both criteria. Accordingly the model was used for the second-order model.

#### 5.5.2.2 The Second-Order Measurement Model for the Interaction Quality of Malaysian Retail Banks

The second-order measurement model for Interaction Quality was designed to test the relationships between the five subdimensions (Attitude, Behaviour, Expertise, Problem Solving, and Information) and one primary dimension of service quality (Interaction Quality) (see Figure 5.6).

**Figure 5.6: The Second-Order Measurement Model for the Interaction Quality**




$\chi^2$: 509.332, df: 270; GFI: 0.858, RMSEA: 0.060, SRMR: 0.0457, CFI: 0.940, TLI: 0.934, $\chi^2$/df: 1.886, PGFI: 0.713

Byrne (2010) suggests that for a model that consists of more than one level (first-order and second-order), it is advisable to check identification separately for each level. Accordingly, in this study, the identification status of the first-order and higher order portion of the model was verified. The first-order level consists of 25 measured items that generate 276 pieces of information (25 [25+1]/2 = 325) and 55 estimated parameters (25 regression weights and 30 variances). Based on the t-rule, the model was over-identified with 270 *df* (325 pieces of information – 55 parameters). The higher order structure of the second-order measurement model for Interaction Quality with five first-order factors, was over-identified with 5 *df* [10 pieces of information (5[5+1]/2) – 10 estimated parameters (five factor loadings and five residuals)]. Ultimately, both levels were found to be identified (Kline, 2011; Byrne, 2010).

With regard to model fit (see Figure 5.6), all model-fit indices were sufficiently within their relative recommended thresholds except for the GFI (0.858 < 0.90). However, as discussed earlier (see Section 5.5.2.1), the result is acceptable. Overall, the second-order model for Interaction Quality fitted the sample data adequately.

There was substantial evidence of convergent validity because factor loading estimates of all measured items were larger than 0.50 (ranging from 0.562 to 0.922) and statistically significant at the 0.001% level (Hair et al., 2010; Anderson & Gerbing, 1988b; John & Reve, 1982). In addition, the review of CR and AVE for five first-order factors (Attitude, Behaviour, Expertise, Problem Solving, Information) and one primary dimension of service quality (Interaction Quality) were all over 0.70 and 0.50, respectively (see Table 5.21). These results support the reliability and validity of the measures associated with the second-order measurement model for Interaction Quality.

**Table 5.21: The Reliability and Validity Tests of the Second-Order Model for the Interaction Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Attitudes | Aatt1 | 0.823*** | 0.900 | 0.694 | Problem Solving | Aprb2 | 0.866*** | 0.872 | 0.631 |
| | Aatt2 | 0.870*** | | | | Aprb3 | 0.803*** | | |
| | Aatt3 | 0.844*** | | | | Aprb4 | 0.727*** | | |
| | Aatt4 | 0.792*** | | | | Aprb5 | 0.775*** | | |
| Behaviour | Abe1 | 0.704*** | 0.848 | 0.527 | Information | Ainfo1 | 0.702*** | 0.894 | 0.586 |
| | Abe2 | 0.725*** | | | | Ainfo3 | 0.764*** | | |
| | Abe4 | 0.765*** | | | | Ainfo4 | 0.762*** | | |
| | Abe5 | 0.726*** | | | | Ainfo5 | 0.832*** | | |
| | Abe6 | 0.707*** | | | | Ainfo6 | 0.785*** | | |
| Expertise | Aex1 | 0.725*** | 0.878 | 0.548 | | Ainfo7 | 0.742*** | | |
| | Aex2 | 0.764*** | | | Interaction Quality | Attitudes | 0.811*** | 0.938 | 0.751 |
| | Aex3 | 0.562*** | | | | Behaviour | 0.882*** | | |
| | Aex4 | 0.819*** | | | | Expertise | 0.824*** | | |
| | Aex5 | 0.801*** | | | | Problem Solving | 0.891*** | | |
| | Aex6 | 0.742*** | | | | Information | 0.922*** | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*

*** Statistically significant at the 0.001 level (t > 3.291)

** Statistically significant at the 0.01 level (t > 2.576)

* Statistically significant at the 0.1 level (t > 1.645)

The factor loadings for the higher order that link with the five first-order factors resulted in higher loadings (> 0.70) and were statistically significant at the 0.001% level (Hair et al., 2010). Among the five factors (subdimensions), Information has the strongest indicator for Interaction Quality ($\lambda = 0.922$, t-value = 12.316, $p < 0.001$). This is followed by Problem Solving ($\lambda = 0.891$, t-value = 12.479, $p < 0.001$), Behaviour ($\lambda = 0.882$, t-value = 11.045, $p < 0.001$), Expertise ($\lambda = 0.824$, t-value = 11.094, $p < 0.001$), and finally Attitude ($\lambda = 0.811$, t-value = 11.702, $p < 0.001$). These results support Hypotheses H1 and H7b, therefore Research Objective 1 is satisfied and Research Objective 2 is partially satisfied.

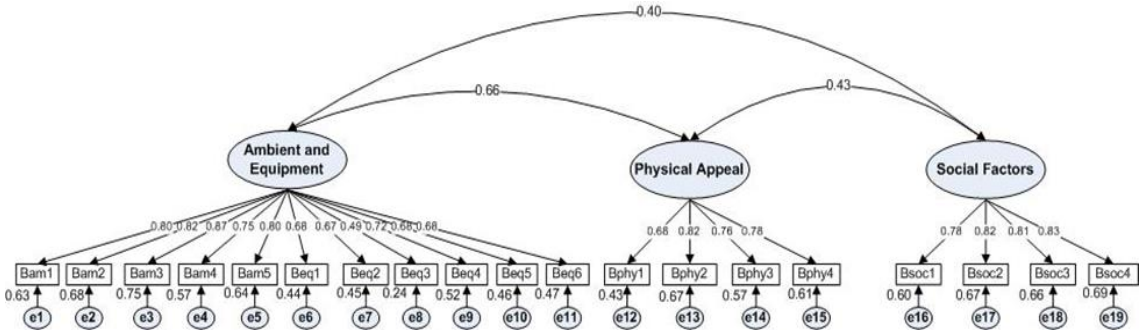
Interaction Quality, i.e., a second-order construct, explains 84.9% of the variance for Information, 79.4% of the variance for Problem Solving, 77.7% of the variance for Behaviour, 67.9% of the variance for Expertise, and 65.7% of the variance for Attitude.

#### 5.5.2.3 The First-Order Measurement Model for the Physical Environment Quality

After the exploratory factor analysis (EFA) (see Section 5.5.1.2.1), the preliminary first-order measurement model was designed to assess the relationships between the three subdimensions of the Physical Environment Quality, i.e., Ambient and Equipment, Physical Appeal and Social Factors, together with their observed indicators. Overall, the model specifies 19 items, which resulted in 190 pieces of information **(**19 [19 +1]/ 2 = 190**)** and 41 estimated parameters (16 regression weights, 3 covariances, and 22 variances); the model was over-identified with 149 *df* (190 pieces of information - 41 parameters) (Kline, 2011; Byrne, 2010).

All the standardized factor loadings are well above the 0.50 cut-off point (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988), ranging from 0.66 to 0.87 except for item Beq3 (Ambient & Equipment) (see Figure 5.7). The factor loading for Beq3 was slightly below (0.49) the cut-off point of 0.50 and so was removed from the preliminary model (Kline, 2011; Hair et al., 2010). All items were statistically significant at the 0.001% level, indicating unidimensionality among the items.

**Figure 5.7: The Preliminary First-Order Measurement Model for the Physical Environment Quality**




$\chi^2$: 475.738, df: 149, GFI: 0.822, RMSEA: 0.094, SRMR: 0.0515, CFI: 0.887, TLI: 0.870

$\chi^2$/df: 3.193, PGFI: 0.645

Figure 5.7 shows that the model was a misfit because most goodness-of-fit indices were beyond their recommended thresholds, i.e., the chi-square was significant ($\chi^2$ =475.738, df =149, P = 0.000, *N* = 251), GFI = 0.822, RMSEA = 0.094, CFI = 0.887, and TLI = 0.870. Except for $\chi^2$/df = 3.193, SRMR = 0.0515, and PGFI = 0.645 the indices relatively fitted. The results of the CFA indicate that the preliminary measurement model needs to be modified. Therefore, a further detailed assessment of the modifications was made.

First, an assessment of the standardized residuals was performed. Except for items Beq3, Beq5, and Bam2, the matrix showed that all residual values were less than 2.58 (Janssens et al., 2008; Schumacker & Lomax, 2004). Examination of the modification indices (MI) indicated a few items had MI greater than 3.84 and had large expected change estimates of EPC (MacKenzie et al., 2011). During the process, other factors such as the goodness-of-fit of the model, the reliability and validity, and the number of items in the constructs were also considered simultaneously.

Accordingly, the preliminary first-order model for Physical Environment Quality was re-specified twice (see Table 5.22) because of the unacceptably high values of MI, and standardized residuals, and low factor loadings.

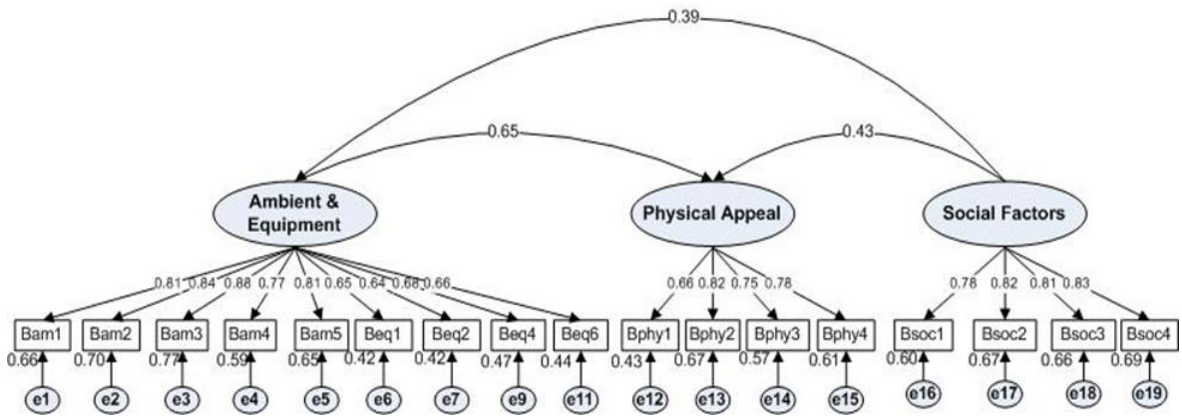
**Table 5.22: The Deleted Items for the Physical Environment Quality**

| Item Coding | Attribute | Reason for deletion |
|---|---|---|
| Beq3 | The XYZ Bank employs the latest technology in banking. | R, F: < .05, MI: 30.095 (with Beq2) |
| Beq5 | The XYZ Bank's ATM machine is easy to operate. | R, MI: 33.706 (with Beq6) |

*Note: R: Standardized residual covariance >2.58, MI: Modification index for error term correlation, F: Factor loading*

The removal of the items Beq3 and Beq5 did not significantly change the conceptualised content of the construct because the essential aspects of the construct are captured by the remaining items. The item Bam2 was not removed from the model because of the 20% rule advocated by Hair et al. (2010). The final modified model shows a minimum of four and a maximum of nine items remain for each construct (see Figure 5.8).

**Figure 5.8: The Modified First-Order Measurement Model for the Physical Environment Quality**




$\chi^2$: 259.629, df: 116, GFI: 0.890, RMSEA: 0.070, SRMR: 0.0546, CFI: 0.943, TLI: 0.933

$\chi^2$/df: 2.238, PGFI: 0.675

The modified first-order model for Physical Environment Quality consists of 17 items that generate 136 pieces of information **(**17 [17+1]/ 2 = 153**)** with 37 estimated parameters (14 regression weights, 3 covariances and 20 variances); the model was over-identified with 116 *df* (153 pieces of information – 37 parameters) (Kline, 2011; Byrne, 2010).

The standardized factor loadings were statistically significant at the 0.001% level, ranging from 0.646 to 0.879, all being well above the acceptable value of 0.50, indicating unidimensionality among the items (see Table 5.24) (Bagozzi & Yi, 1988). A good rule of thumb is that the standardized loading estimates should be 0.5 or higher, but ideally 0.7 or higher (Hair et al., 2010). Although five loading estimates are below 0.7 (i.e., 0.646; 0.651; 0.657; 0.659; 0.684), they do not appear to significantly harm the model fit or the internal consistency (see Tables 5.23 and 5.24). In addition, all items' R square values are greater than 0.20 (see Appendix 14) (Kline, 2011), therefore all the items are retained.

Based on Table 5.23, Model III is the best-fitting model among the modified models and is considered the ultimate first-order model for Physical Environment Quality (see Figure 5.8). All the goodness-of-fit-indexes were improved and within their recommended thresholds except for GFI (0.890). The GFI value is close to the recommended 0.90 threshold

and thus considered marginally adequate (see Section 5.5.2.1) (Hair et al., 2006; Kim, 2003; Kline, 2005). Additionally, the modified first-order CFA model for Physical Environment Quality exhibits adequate unidimensionality since the CFI index of 0.943 is above the recommended threshold of 0.90 (Sureshchandar et al. 2001).

**Table 5.23: The Improvement in the Fit of the First-Order Model for the Physical Environment Quality**

| Model | | GFI | RMSEA | SRMR | CFI | $\chi^2$/df | PGFI |
|---|---|---|---|---|---|---|---|
| I. | Original Model | 0.822 | 0.094 | 0.0515 | 0.887 | 3.193 | 0.645 |
| II. | Deleting Beq3 | 0.837 | 0.092 | 0.0614 | 0.900 | 3.109 | 0.646 |
| III. | Deleting Beq5 | 0.890 | 0.070 | 0.0546 | 0.943 | 2.238 | 0.675 |

The improvement in the model fit was also examined by subtracting the overall $\chi^2$ statistics for the modified model from those of the preliminary model. Comparing the preliminary model ($\chi^2_{[149]}$ = 475.738) with the modified model ($\chi^2_{[116]}$ = 259.629) yielded a difference in the $\chi^2$ value of 216.11 ($\Delta\chi^2_{[33]}$ =216.11). Since ($\Delta\chi^2_{[33]}$ = 216.11) > $\chi^2_{47.3998,\alpha.05}$, the modified first-order model was statistically significant and was improved in the model-fit indices (Hair et al., 2010; Iacobucci, 2010; Jöreskog, 1993; Bentler, 1990; Bollen, 1989).

For convergent validity verification, construct reliability (CR) and average variance extracted (AVE) were computed (Fornell & Larcker, 1981). The CR values for each of the three subdimensions are all greater than the 0.70 cut-off value, ranging from 0.841 to 0.921 (see Table 5.24). All AVE values are also above the minimum criterion of >0.50, ranging from 0.569 to 0.656 suggesting that all subdimensions have captured a relatively high level of variance and adequate convergence (MacKenzie et al., 2011; Hair et al., 2010; Segars, 1997; Anderson & Gerbing, 1988b; Bagozzi & Yi, 1988; Fornell & Larcker, 1981). The CR and AVE results both signify that the reliability and validity of each subdimension are supported, therefore convergent validity is achieved (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988; Nunnally, 1978).

The CFA results also reveal that the correlation coefficients of all pairs of the three subdimensional factors of Physical Environment Quality are below 0.85. The evidence signifies the existence of discriminant validity between all constructs (see Figure 5.8).

**Table 5.24: The Reliability and Validity Tests of the First-Order Model for the Physical Environment Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Ambient & Equipment | Bam1 | 0.813*** | 0.921 | 0.569 | Physical Appeal | Bphy1 | 0.659*** | 0.841 | 0.570 |
| | Bam2 | 0.836*** | | | | Bphy2 | 0.821*** | | |
| | Bam3 | 0.879*** | | | | Bphy3 | 0.754*** | | |
| | Bam4 | 0.770*** | | | | Bphy4 | 0.777*** | | |
| | Bam5 | 0.807*** | | | Social Factors | Bsoc1 | 0.777*** | 0.884 | 0.656 |
| | Beq1 | 0.651*** | | | | Bsoc2 | 0.817*** | | |
| | Beq2 | 0.646*** | | | | Bsoc3 | 0.812*** | | |
| | Beq4 | 0.684*** | | | | Bsoc4 | 0.833*** | | |
| | Beq6 | 0.657*** | | | | | | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*
*** Statistically significant at the 0.001 level (t > 3.291)
** Statistically significant at the 0.01 level (t > 2.576)
* Statistically significant at the 0.1 level (t > 1.645)

The modified first-order Physical Environment Quality model (Model III) satisfactorily met the criteria as the majority of standardized factor loadings were greater than 0.70 and the correlations between the factors were less than 0.90 (Kline, 2011). The first result indicates convergent validity, the second, discriminant validity; therefore the model was used to measure the second-order model.

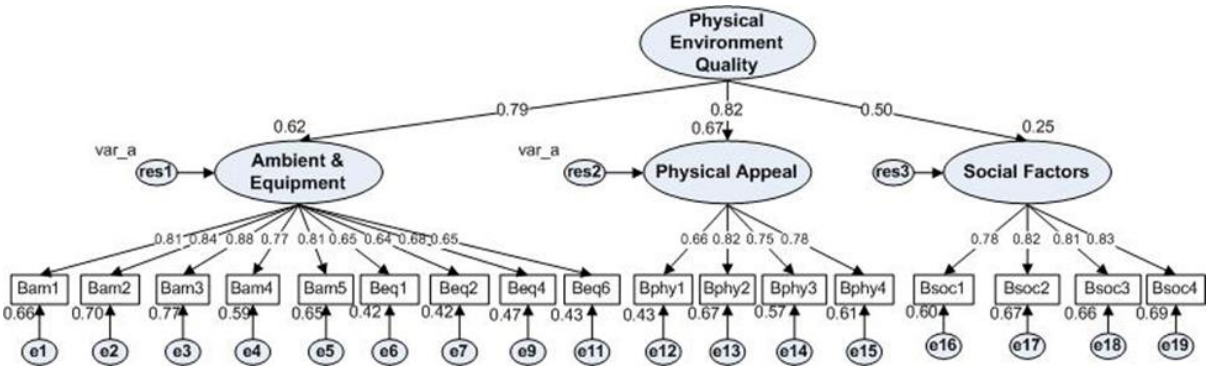
#### 5.5.2.4 The Second-Order Measurement Model for the Physical Environment Quality

The second-order measurement model for Physical Environment Quality was designed to test the relationships between the three subdimensions (Ambient and Equipment, Physical Appeal, Social Factors) and one primary dimension of service quality (Physical Environment Quality) (see Figure 5.9).

Byrne (2010) suggests that for a model that consists of more than one level (first-order and second-order), it is advisable to check for identification seperately for each level. The first level model consists of 17 measured items that generate 153 pieces of information (17 [17+1]/2 = 153). The number of estimated parameters in the model is 37 (17 regression weights and 20 variances). Based on the t-rule, the model was over-identified with 116 *df* (153 pieces of information – 37 parameters). However, the higher order structure of the second-order measurement model for Physical Environment Quality with three first-order

factors was just-identified with 0 *df* [6 pieces of information (3[3+1]/2) – 6 estimated parameters (three factor loadings and three residuals)].

**Figure 5.9: The Second-Order Measurement Model for the Physical Environment Quality**




$\chi^2$: 259.830, df: 117, GFI: 0.890, RMSEA: 0.070, SRMR: 0.0549, CFI: 0.943, TLI: 0.934

$\chi^2$/df: 2.221, PGFI: 0.681

To resolve the just-identified issue, Byrne (2010) and Schumacker and Lomax (2004) suggest placing equality constraints on particular parameters that are approximately equal, in order to get the model over-identified. Initially, the residual variances of Ambient and Equipment, and Physical Appeal were chosen because both account for small variances; 0.209 and 0.160 respectively. Further inspection was based on the critical ratios for the differences (CRDIFF)[25] method, which is available in AMOS output (Byrne, 2010). The CRDIFF output demonstrates that both residuals were less than the critical value of 1.96, implying that the hypothesis that these two residuals' variances were equal in the population could be accepted. Based on these findings, it was reasonable to place equality constraints (var_a) on both residuals. As a result, the higher-order structure of the second-order model for Physical Environment Quality was over-identified with one degree of freedom. The higher-order model generates 6 pieces of information (3[3+1]/2) > 5 estimated parameters (three factor loadings and two residuals).

All model-fit indices were sufficiently within their relative recommended thresholds (see Figure 5.9) except for the GFI. The value of the GFI (0.890) was close to the recommended 0.90 threshold, thus the model-fit-indices were interpreted as marginally adequate (Hair et al., 2006; Kline, 2005; Kim, 2003). Additionally, there was substantial evidence of convergent validity because factor loading estimates of all measured items were

[25] CRDIFF produces a listing of critical ratios for the pairwise differences among all parameter estimates.

greater than 0.50 (ranging from 0.504 to 0.879) and statistically significant at $p < 0.001$ (Hair et al., 2010; Anderson & Gerbing, 1988; John & Reve, 1982).

Further, a review of the CR and AVE for the three first-order factors (Ambient and Equipment, Physical Appeal and Social Factors) and one primary dimension of service quality (Physical Environment Quality) revealed all were above 0.70 and 0.50, respectively (see Table 5.25). These results support the reliability and validity of the measures associated with the second-order measurement model for Physical Environment Quality.

The factor loadings for the higher order that link with the three first-order factors resulted in higher loadings (>0.70) and, except for Social Factors, were statistically significant at the 0.001% level (see Table 5.25). The factor loading for Social Factors was 0.504, and sufficiently satisfied the 0.50 rule of thumb (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988). The strongest indicator of Physical Environment Quality was Physical Appeal ($\lambda = 0.819$, t-value = 10.054, $p < 0.001$) followed by Ambient and Equipment ($\lambda = 0.789$, t-value = 8.458, $p < 0.001$) and Social Factors ($\lambda = 0.504$, t-value = 6.600, $p < 0.001$). These results support Hypotheses H2 and H7b and therefore support Research Objective 1 and partially support Research Objective 2.

**Table 5.25: The Reliability and Validity Tests of the Second-Order Model for the Physical Environment Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Ambient & Equipment | Bam1 | 0.813*** | 0.921 | 0.568 | Social Factors | Bsoc1 | 0.776*** | 0.884 | 0.656 |
| | Bam2 | 0.836*** | | | | Bsoc2 | 0.817*** | | |
| | Bam3 | 0.879*** | | | | Bsoc3 | 0.812*** | | |
| | Bam4 | 0.770*** | | | | Bsoc4 | 0.833*** | | |
| | Bam5 | 0.807*** | | | Physical Environment Quality | Ambient & Equipment | 0.789*** | 0.754 | 0.516 |
| | Beq1 | 0.650*** | | | | Physical Appeal | 0.819*** | | |
| | Beq2 | 0.645*** | | | | Social Factors | 0.504*** | | |
| | Beq4 | 0.683*** | | | | | | | |
| | Beq6 | 0.653*** | | | | | | | |
| Physical Appeal | Bphy1 | 0.660*** | 0.841 | 0.572 | | | | | |
| | Bphy2 | 0.821*** | | | | | | | |
| | Bphy3 | 0.755*** | | | | | | | |
| | Bphy4 | 0.779*** | | | | | | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*

*** Statistically significant at the 0.001 level (t > 3.291)

** Statistically significant at the 0.01 level (t > 2.576)

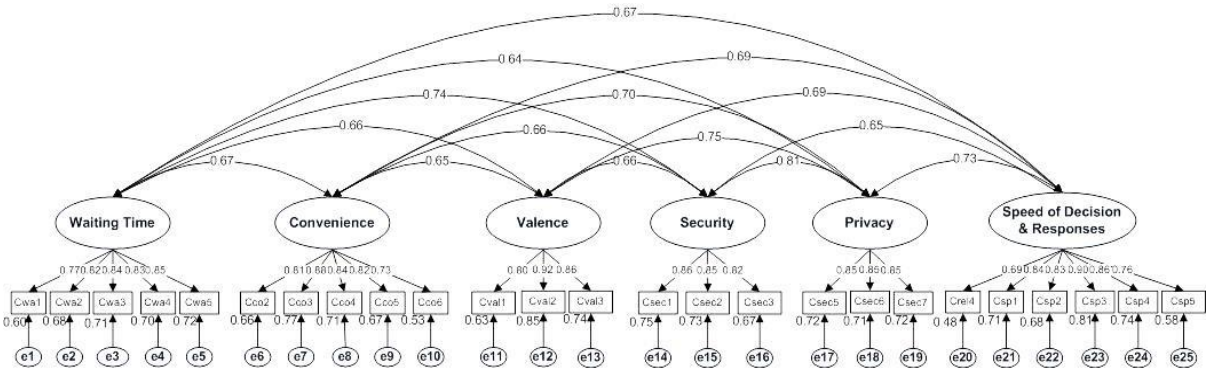
* Statistically significant at the 0.1 level (t > 1.645)

The second-order construct (i.e., Physical Environment Quality) explained 62.2% of the variance for ambient and equipment, 67.1% of the variance for physical appeal and 25.4% of the variance for social factors. According to Kline (2011), items with low multiple R-square (less than 0.20) should be removed from the analysis because this indicates very high levels of error. In this case, all the items show multiple R-square (squared multiple correlations) greater than 0.20 (see Appendix 15); therefore all factors are retained in the analysis.

#### 5.5.2.5 The First-Order Measurement Model for the Outcome Quality

After the EFA result (see Section 5.5.1.3.1), the preliminary first-order measurement model was developed (see Figure 5.10) to assess the relationships between the six subdimensions of Outcome Quality, i.e., Waiting Time, Convenience, Valence, Security, Privacy, and Speed of Decisions and Responses, together with their observed indicators. The postulated model contains 25 items that resulted in 325 pieces of information (25 [25+1] 2 = 325) and 65 estimated parameters (19 regression weights, 15 covariances and 31 variances). The model was over-identified with 260 *df* (325 pieces of information - 65 parameters) (Kline, 2011; Byrne, 2010). All the standardized factor loadings are well above the cut-off point 0.50 (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988), ranging from 0.69 to 0.92. All items are statistically significant at the 0.001% level, indicating unidimensionality among the items (see Figure 5.10).

**Figure 5.10: The Preliminary First-Order Measurement Model for the Outcome Quality**




$\chi^2$: 464.142, df: 260 GFI: 0.876, RMSEA: 0.056, SRMR: 0.0454, CFI: 0.959, TLI: 0.953

$\chi^2$/df: 1.785, PGFI: 0.701

Figure 5.10 shows that the model was a relatively good fit since most of the goodness-of-fit indices were within their recommended thresholds: i.e., RMSEA = 0.056, SRMR = 0.0454, CFI = 0.959, and TLI = 0.953, $\chi^2$/df = 1.785, and PGFI = 0.701. The exceptions were the chi-square, which was significant ($\chi^2$ = 464.142, df =260, P = 0.000, *N*= 251) and the GFI = 0.876. The GFI is close to 0.90, thus the first-order model is considered as marginally adequate (see Section 5.5.2.1). However, in order to find a better fitting model to the sample variance-covariance matrix, a modification search was performed (Schumacker & Lomax, 2004).

First, the standardized residuals were assessed. The matrix shows all residual values were less than 2.58 (Janssens et al., 2008; Schumacker & Lomax, 2004). Conversely, an examination of the modification indices (MI) indicated a few items had an MI greater than 3.84 and there were large expected change estimates of EPC (MacKenzie et al., 2011). Simultaneously, the goodness-of-fit of the model, the reliability and validity, and the number of items in the constructs were considered.

Accordingly, because of the unacceptably high values of MI, a preliminary first-order model for Outcome Quality was re-specified three times (see Table 5.26). Removal of the items Csp2, Cwa2 and Cco4 did not significantly change the conceptualised content of the construct because the essential aspects of the construct are captured by the remaining items. In addition, the item removal does not exceed the 20% rule proposed by Hair et al. (2010). The final model shows that a minimum of three and a maximum of five items remained for each construct (see Figure 5.11).

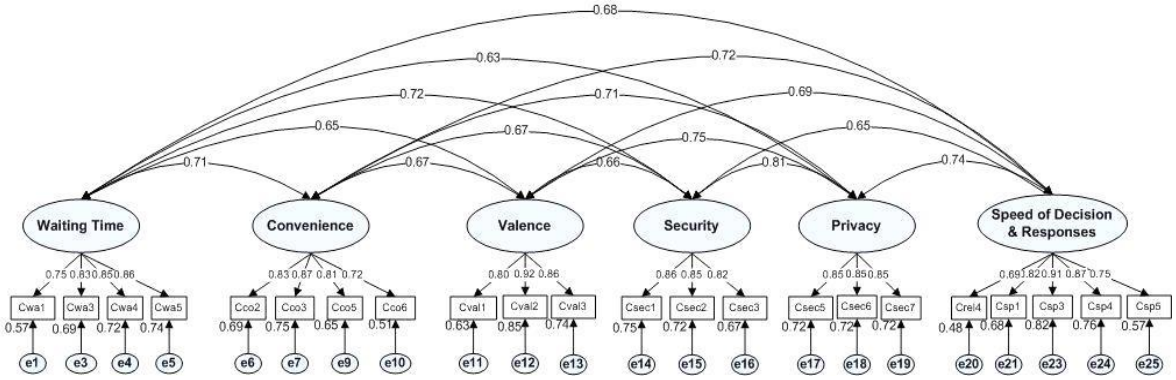
**Table 5.26: The Deleted Items for the Outcome Qualilty**

| Item Coding | Attribute | Reason for deletion |
|---|---|---|
| Csp2 | The XYZ Bank is responsive to my requests. | MI: 14.388 (with Csp1) |
| Cwa2 | I do not have to wait long to be served in the XYZ Bank. | MI: 7.524 (with Cwa1) |
| Cco4 | I find a variety of transactions can be performed at the XYZ Bank ATMs. | MI: 6.717 (with Csec5) |

*Note: MI:Modification index for error term correlation*

The modified first-order model for Outcome Quality consists of 22 items that generate 253 pieces of information **(**22 [22+1]/ 2 = 253**)** with 59 estimated parameters (16 regression weights, 15 covariances and 28 variances); the model was over-identified with 194 *df* (253 pieces of information – 59 parameters) (Kline, 2011; Byrne, 2010).

**Figure 5.11: The Modified First-Order Measurement Model for the Outcome Quality**




$\chi^2$: 327.131, df: 194 GFI: 0.898, RMSEA: 0.052, SRMR: 0.0438, CFI: 0.968, TLI: 0.962

$\chi^2$/df: 1.686, PGFI: 0.689

The standardized factor loadings ranged from 0.689 to 0.922, i.e., above the acceptable value of 0.50 (Bagozzi & Yi, 1988) (see Table 5.26). Standardized loading estimates should be 0.5 or higher, ideally 0.7 or higher (Hair et al., 2010). Except for Crel4 (0.689), which was only slightly lower than 0.7, all items have factor loadings greater than 0.7. All items were statistically significant at the 0.001% level, indicating unidimensionality among the items. Table 5.27 shows that all goodness-of-fit indexes were improved and within their recommended thresholds except for the GFI. Although the GFI is still below the threshold, the value was improved to 0.898 compared with 0.876 in the preliminary model. The GFI for the modified model was close to the recommended 0.90 threshold and, as discussed in Section 5.5.2.1, the model is considered marginally adequate (Kline, 2011; MacKenzie et al., 2011; Hair et al., 2010; Narayan et al., 2008; Kim, 2003). Hence, Model III is the best fitting model among the modified models and was considered the ultimate first-order model for Outcome Quality (see Figure 5.11). The model exhibited adequate unidimensionality since the CFI index was 0.968, above the recommended threshold of 0.90 (Sureshchandar et al., 2001).

The improvement in the model fit was also examined by subtracting the overall $\chi^2$ statistics for the modified model from those of the preliminary model. Comparing the preliminary model ($\chi^2_{[260]}$ = 464.142) with the modified model ($\chi^2_{[194]}$ = 327.131) yielded a difference in the $\chi^2$ value of 137.01 ($\Delta\chi^2_{[66]}$ =137.01). Since ($\Delta\chi^2_{[66]}$ = 137.01) > $\chi^2_{85.9649,\alpha\ .05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit indices (Hair et al., 2010; Iacobucci, 2010; Bentler, 1990; Bollen, 1989).

**Table 5.27: The Improvement in the Fit of the First-Order Model for the Outcome Quality**

| Model | | GFI | RMSEA | SRMR | CFI | $\chi^2$/df | PGFI |
|---|---|---|---|---|---|---|---|
| I. | Original Model | 0.876 | 0.056 | 0.0454 | 0.959 | 1.785 | 0.701 |
| II. | Deleting Csp2, Cwa2 | 0.891 | 0.053 | 0.0450 | 0.966 | 1.701 | 0.694 |
| III. | Deleting Csp2, Cwa2, Cco4 | 0.898 | 0.052 | 0.0439 | 0.968 | 1.686 | 0.689 |

The CR value for each of the six subdimensions was greater than the 0.70 cut-off, ranging between 0.882 and 0.906 (see Table 5.28) indicating high internal consistency of the measurement scales (Hair et al., 2006; Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

**Table 5.28: The Relibility and Validity Tests of the First-Order Model for the Outcome Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Waiting Time | Cwa1 | 0.754*** | 0.895 | 0.682 | Security | Csec1 | 0.864*** | 0.882 | 0.714 |
| | Cwa3 | 0.832*** | | | | Csec2 | 0.851*** | | |
| | Cwa4 | 0.851*** | | | | Csec3 | 0.818*** | | |
| | Cwa5 | 0.863*** | | | Privacy | Csec5 | 0.851*** | 0.886 | 0.721 |
| Convenience | Cco2 | 0.829*** | 0.882 | 0.653 | | Csec6 | 0.847*** | | |
| | Cco3 | 0.868*** | | | | Csec7 | 0.850*** | | |
| | Cco5 | 0.809*** | | | Speed of | Crel4 | 0.689*** | 0.906 | 0.661 |
| | Cco6 | 0.717*** | | | Decisions | Csp1 | 0.824*** | | |
| Valence | Cval1 | 0.796*** | 0.895 | 0.740 | & | Csp3 | 0.906*** | | |
| | Cval2 | 0.922*** | | | Responses | Csp4 | 0.871*** | | |
| | Cval3 | 0.858*** | | | | Csp5 | 0.754*** | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*
*** Statistically significant at the 0.001 level (t > 3.291)
** Statistically significant at the 0.01 level (t > 2.576)
* Statistically significant at the 0.1 level (t > 1.645)

All AVE values also exceeded the minimum criterion of > 0.50, ranging between 0.653 and 0.740 suggesting all the subdimensions have captured a relatively high level of variance and adequate convergence (MacKenzie et al., 2011; Hair et al., 2010; Segars, 1997; Bagozzi & Yi, 1988; Fornell & Larcker, 1981). The CR and AVE results both signify that the reliability and validity of each subdimension are supported, therefore convergent validity was achieved (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988; Nunnally, 1978).

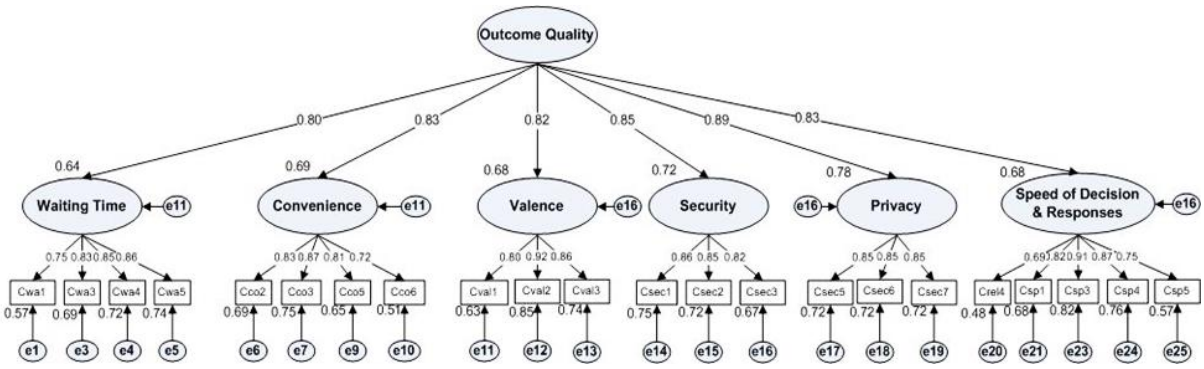
The CFA results also reveal that the correlation coefficients of all pairs of the six subdimensional factors of Outcome Quality were below 0.85. The evidence signifies the existence of discriminant validity between all constructs (see Figure 5.11). Therefore, based on the convergent and discriminant validity results, the modified first-order Outcome Quality (Model III) was used for the second-order model.

#### 5.5.2.6 The Second-Order Measurement Model for Outcome Quality

The second-order measurement model for Outcome Quality was designed to test the relationships between the six subdimensions (Waiting Time, Convenience, Valence, Security, Privacy, and Speed of Decisions and Responses) and one primary dimension of service quality (Outcome Quality) (see Figure 5.12).

In this study, the identification status of the first-order level and higher order portion of the model was assessed (Byrne, 2010). The first-order level consists of 22 measured items that generated 253 pieces of information (22 [22+1]/2 = 253) and 50 estimated parameters (22 regression weights and 28 variances). Based on the t-rule, the model was over-identified with 203 *df* (253 pieces of information – 50 parameters).

**Figure 5.12: The Second-Order Model for the Outcome Quality**




$\chi^2$: 364.060, df: 203 GFI: 0.884, RMSEA: 0.056, SRMR: 0.0489, CFI: 0.962, TLI: 0.956
$\chi^2$/df: 1.793, PGFI: 0.709

The higher order structure of the second-order model for Outcome Quality with six first-order factors was over-identified with 9 *df* [21 pieces of information (6[6+1]/2) – 12 estimated parameters (six factor loadings and six residuals)]. Ultimately, both levels were found to be identified (Kline, 2011; Byrne, 2010).

With regard to model fit (see Figure 5.12), all model-fit indices satisfied their relative recommended thresholds except for the GFI (0.884 < 0.90). However, according to the discussion in Section 5.5.2.1, the result is acceptable. Further removal of the items in order to increase the GFI, is not encouraged because of the 20% rule suggested by Hair et al. (2010). Overall, the second-order model for Outcome Quality is a relatively good fit to the sample data.

There was substantial evidence of convergent validity because factor loading estimates of all measured items were larger than 0.50, ranging from 0.692 to 0.919 and were statistically significant at $p < 0.001$ (Hair et al., 2010; Anderson & Gerbing, 1988b; John & Reve, 1982) (see Table 5.29).

**Table 5.29: The Reliability and Validity Tests for the Second-Order Model for the Outcome Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Waiting Time | Cwa1 | 0.756*** | 0.895 | 0.682 | Security | Csec1 | 0.873*** | 0.882 | 0.714 |
| | Cwa3 | 0.829*** | | | | Csec2 | 0.844*** | | |
| | Cwa4 | 0.850*** | | | | Csec3 | 0.816*** | | |
| | Cwa5 | 0.865*** | | | Privacy | Csec5 | 0.848*** | 0.886 | 0.722 |
| Convenience | Cco2 | 0.829*** | 0.882 | 0.652 | | Csec6 | 0.852*** | | |
| | Cco3 | 0.870*** | | | | Csec7 | 0.848*** | | |
| | Cco5 | 0.804*** | | | Speed of | Crel4 | 0.692*** | 0.906 | 0.662 |
| | Cco6 | 0.719*** | | | Decisions & | Csp1 | 0.826*** | | |
| Valence | Cval1 | 0.795*** | 0.895 | 0.739 | Responses | Csp3 | 0.905*** | | |
| | Cval2 | 0.919*** | | | | Csp4 | 0.870*** | | |
| | Cval3 | 0.862*** | | | | Csp5 | 0.756*** | | |
| | | | | | Outcome Quality | Waiting Time | 0.802*** | 0.933 | 0.699 |
| | | | | | | Convenience | 0.828*** | | |
| | | | | | | Valence | 0.822*** | | |
| | | | | | | Security | 0.848*** | | |
| | | | | | | Privacy | 0.886*** | | |
| | | | | | | Speed of Decisions & Responses | 0.827*** | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*

*** Statistically significant at the 0.001 level (t > 3.291)

** Statistically significant at the 0.01 level (t > 2.576)

* Statistically significant at the 0.1 level (t > 1.645)

The review of CR and AVE for the six first-order factors (Waiting Time, Convenience, Valence, Security, Privacy, and Speed of Decisions and Responses) and one primary dimension of service quality (Outcome Quality) revealed all were above 0.70 and 0.50, respectively (see Table 5.29). Thus, the factor loadings supported the reliability and validity of the measures associated with the second-order measurement model for Outcome Quality.

The factor loadings for the higher order that linked with the six first-order factors resulted in higher loadings (> 0.70), which were statistically significant at the 0.001% level. The strongest indicator of Outcome Quality was Privacy ($\lambda = 0.886$, t-value = 13.761, $p < 0.001$), followed by Security ($\lambda = 0.848$, t-value = 12.511, $p < 0.001$), Convenience ($\lambda = 0.828$, t-value = 10.806, $p < 0.001$), Speed of Decisions and Responses ($\lambda = 0.827$, t-value = 11.496, $p < 0.001$), Valence ($\lambda = 0.822$, t-value = 12.842, $p < 0.001$), and Waiting Time ($\lambda = 0.802$, t-value = 12.546, $p < 0.001$). These results support Hypotheses H3 and H7b, therefore supporting Research Objective 1 and partially supporting Research Objective 2. The second-order construct represented by Outcome Quality, explained 64.3% of the variance for waiting time, 68.6% of the variance for convenience, 67.6% of the variance for valence, 71.9% of the variance for security, 78.4% of the variance for privacy, and 68.4% of the variance for speed of decisions and responses.

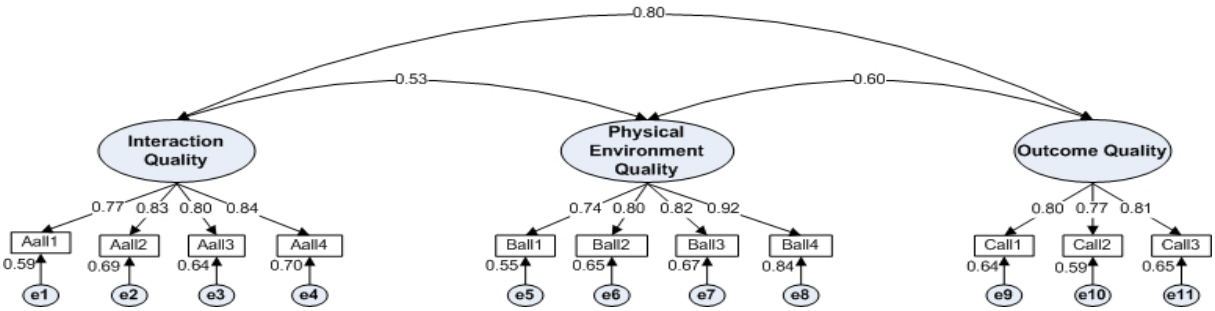
#### 5.5.2.7 The First-Order Model for the Service Quality Construct

As shown in Figure 5.13, the preliminary first-order model was intended to assess the relationships between the three primary dimensions of Service Quality, i.e., Interaction Quality, Physical Environment Quality, and Outcome Quality, together with their observed indicators. The preliminary model contains 11 items that resulted in 66 pieces of information **(**11 [11+1] 2 = 66**)** and 25 estimated parameters (8 regression weights, 3 covariances and 14 variances). The model was over-identified with 41 *df* (66 pieces of information - 25 parameters) (Kline, 2011; Byrne, 2010).

All the standardized factor loadings were well above the cut-off point of 0.50 (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988), ranging from 0.74 to 0.92. All items were statistically significant at the 0.001% level, indicating unidimensionality among the items (see Figure 5.13). Figure 5.13 demonstrates that the model was an adequate fit since most goodness-of-fit indices were within the recommended thresholds: i.e., GFI = 0.946, RMSEA = 0.058, SRMR = 0.0395, CFI = 0.980, TLI = 0.973, $\chi^2$/df = 1.829, and PGFI =

0.587. The exception was the chi-square, which was significant ($\chi^2$ = 74.997, df =41, P = 0.001, *N*= 251). However, the model is acceptable because chi-square is sensitive to sample size (see Bagozzi & Yi, 2012; Byrne, 2010; Hu & Bentler, 1999; Bentler & Bonnet, 1980).

**Figure 5.13: The First-Order Model for the Service Quality Construct**




$\chi^2$: 74.997, df: 41, GFI: 0.946, RMSEA: 0.058, SRMR: 0.0395, CFI: 0.980, TLI: 0.973, $\chi^2$/df: 1.829, PGFI: 0.587

A large sample size will cause the chi-square value to be statistically significantly different from 0 even when the fit of the data to the model is good (Schreiber, 2008). Therefore, the chi-square statistic nearly always rejects the model when large samples are used (Bentler & Bonnet, 1980) and also, even with only modest sample sizes (Iacobucci, 2010).

On the other hand, where small samples are used, the chi-square statistic lacks power and because of this may not discriminate between good fitting models and poor fitting models (Kenny & McCoach, 2003). In this study, the sample size used is 251 (which is medium large), and thus may contribute to the significance of chi-square. Due to the restrictiveness of the chi-square statistic, researchers have depended on alternative indices to assess model fit (MacKenzie et al., 2011; Iacobucci, 2010; Hooper et al., 2008).

Therefore, assessment of a modification was not required because the results of the alternative model-fit indices were more than satisfactory and the parameter estimates were all significant at the 0.001% level. Additionally, the first-order measurement model for service quality has an adequate unidimensionality because the CFI index was 0.980, above the recommended threshold of 0.90 (Sureshchandar et al., 2001).

The construct reliability (CR) and average variance extracted (AVE) were computed to verify convergent validity (Fornell & Larcker, 1981). The CR for each of the three subdimensions was greater than the 0.70 cut-off value, ranging between 0.833 and 0.892 (see

Table 5.30) indicating high internal consistency of the measurement scales (Hair et al., 2010; Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

**Table 5.30: The Reliability and Validity Tests for the First-Order Model for the Service Quality Construct**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Interaction Quality | Aall1 | 0.765*** | 0.883 | 0.654 | Physical Quality | Ball1 | 0.745*** | 0.892 | 0.676 |
| | Aall2 | 0.831*** | | | | Ball2 | 0.804*** | | |
| | Aall3 | 0.800*** | | | | Ball3 | 0.815*** | | |
| | Aall4 | 0.837*** | | | | Ball4 | 0.916*** | | |
| Outcome Quality | Call1 | 0.798*** | 0.833 | 0.624 | | | | | |
| | Call2 | 0.767*** | | | | | | | |
| | Call3 | 0.805*** | | | | | | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*
*** Statistically significant at the 0.001 level (t > 3.291)
** Statistically significant at the 0.01 level (t > 2.576)
* Statistically significant at the 0.1 level (t > 1.645

All AVE values also exceeded the minimum criterion of >0.50, ranging between 0.624 and 0.676 suggesting the subdimensions have captured a relatively high level of variance and have adequate convergence (MacKenzie et al., 2011; Hair et al., 2010; Segars, 1997; Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

The CR and AVE results both signify that the reliability and validity of each primary dimension are supported, therefore, convergent validity was achieved (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988; Nunnally, 1978). The CFA results also reveal that the correlation coefficient for all pairs of the three primary dimension factors of service quality were below 0.85 (Kline, 2011). The evidence shows discriminant validity exists between all constructs (see Figure 5.13).

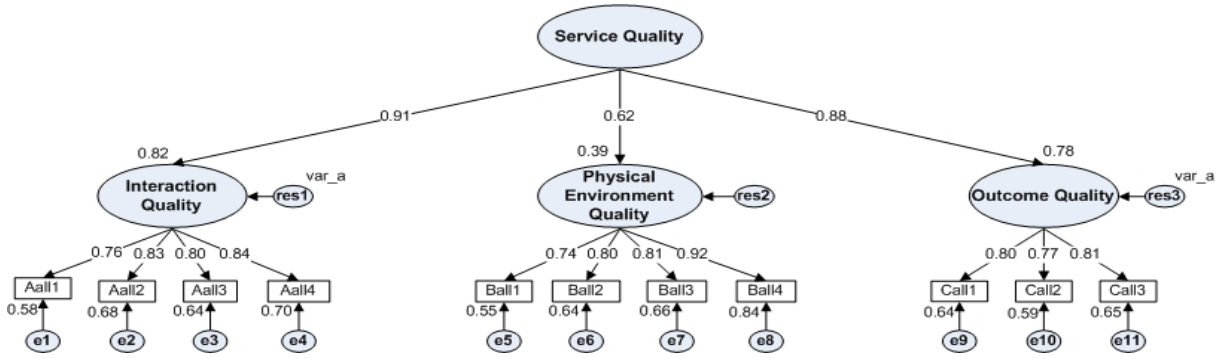
The postulated first-order model for Service Quality satisfactorily met the criterion of standardized factor loadings of more than 0.70, and estimated correlations between the factors are below 0.90 in absolute value. The first result indicates convergent validity; the second, discriminant validity (Kline, 2011). Hence, the model was used for the second-order model.

#### 5.5.2.8 The Second-Order Model for the Service Quality Construct

The second-order model for Service Quality was designed to test the relationships between the three primary dimensions (i.e., Interaction Quality, Physical Environment

Quality, and Outcome Quality) and one independent second-order construct (i.e., Service Quality) (See Figure 5.14).

**Figure 5.14: The Second-Order Measurement Model for the Service Quality Construct**




$\chi^2$: 78.178, df: 42, GFI: 0.943, RMSEA: 0.059, SRMR: 0.0441, CFI: 0.978, TLI: 0.972, $\chi^2$/df: 1.861, PGFI: 0.600

The identification status of the first-order level and the higher order portion of the model was verified (Byrne, 2010). The first-order level consists of 11 measured items that generate 66 pieces of information **(**11 [11+1]/2 = 66**)** and 25 estimated parameters (11 regression weights and 14 variances). Based on the t-rule, the model was over-identified with 41 *df* (66 pieces of information – 25 parameters). The higher-order structure of the second-order measurement model for Service Quality with three first-order factors was just-identified with 0 *df* [6 pieces of information (3[3+1]/2) – 6 estimated parameters (three factor loadings and three residuals)].

To resolve the just-identified issue, Byrne (2010) and Schumacker and Lomax (2004) suggest placing equality constraints on particular parameters that are approximately equal, in order to get the model over-identified. Initially, the residual variances of Interaction Quality and Outcome Quality were chosen because both account for small variances. Further inspection was based on the critical ratios for differences (CRDIFF) method, which is available in AMOS output (Byrne, 2010). The CRDIFF output demonstrates that both residuals were less than the critical value of 1.96, implying the hypothesis that these two residuals' variances were equal in the population and could be accepted. Based on these findings, it was acceptable to place equality constraints (var_a) on the residuals' variances of Interaction Quality and Outcome Quality. As a result, the higher-order structure of the second-order model for Service Quality was over-identified with one degree of freedom. The higher-order model generated six pieces of information (3[3+1]/2) > five estimated

parameters (three factor loadings and two residuals). With regard to model fit (see Figure 5.14), all the model-fit-indices were within their relative recommended thresholds. Hence, model modification was not required because the model had good relative fit.

There was substantial evidence of convergent validity because factor loading estimates of all measured items were greater than 0.50, ranging from 0.624 to 0.918 and were all significant at the 0.001% level (Hair et al., 2010; Anderson & Gerbing, 1988b; John & Reve, 1982). A review of the CRs and AVEs for the three first-order factors (interaction, physical environment, and outcome) and one independent second-order construct (Service Quality) revealed all were above 0.70 and 0.50, respectively (see Table 5.31). These results support the reliability and validity of the measures associated with the second-order model for Service Quality.

Factor loadings for the higher order that linked with the three first-order factors were all greater than 0.5 and statistically significant at the 0.001% level (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988). Service Quality, which is the second-order construct, explained 82.4% of the variance for Interaction Quality, 38.9% of the variance for Physical Environment Quality and 77.5% of the variance for Outcome Quality.

**Table 5.31: The Reliability and Validity Tests for the Second-Order Model for the Service Quality**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Interaction Quality | Aall1 | 0.763*** | 0.881 | 0.651 | Physical Environment Quality | Ball1 | 0.744*** | 0.892 | 0.676 |
| | Aall2 | 0.827*** | | | | Ball2 | 0.803*** | | |
| | Aall3 | 0.799*** | | | | Ball3 | 0.815*** | | |
| | Aall4 | 0.835*** | | | | Ball4 | 0.918*** | | |
| Outcome Quality | Call1 | 0.802*** | 0.836 | 0.630 | Service Quality | Interaction | 0.908*** | 0.852 | 0.663 |
| | Call2 | 0.767*** | | | | Physical | 0.624*** | | |
| | Call3 | 0.812*** | | | | Outcome | 0.881*** | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*
*** Statistically significant at the 0.001 level (t > 3.291)
** Statistically significant at the 0.01 level (t > 2.576)
* Statistically significant at the 0.1 level (t > 1.645)

Table 5.31 shows that the strongest indicator for Service Quality was Interaction ($\lambda$ = 0.908, t-value = 13.311, $p < 0.001$), followed by Outcome ($\lambda$ = 0.881, t-value = 12.196, $p < 0.001$) and Physical ($\lambda$ = 0.624, t-value = 9.304, $p < 0.001$). Thus, it may be concluded that Hypotheses H4, H5, H6 and H7a are supported by the data and therefore, Research Objectives 1 and 2 are satisfied.

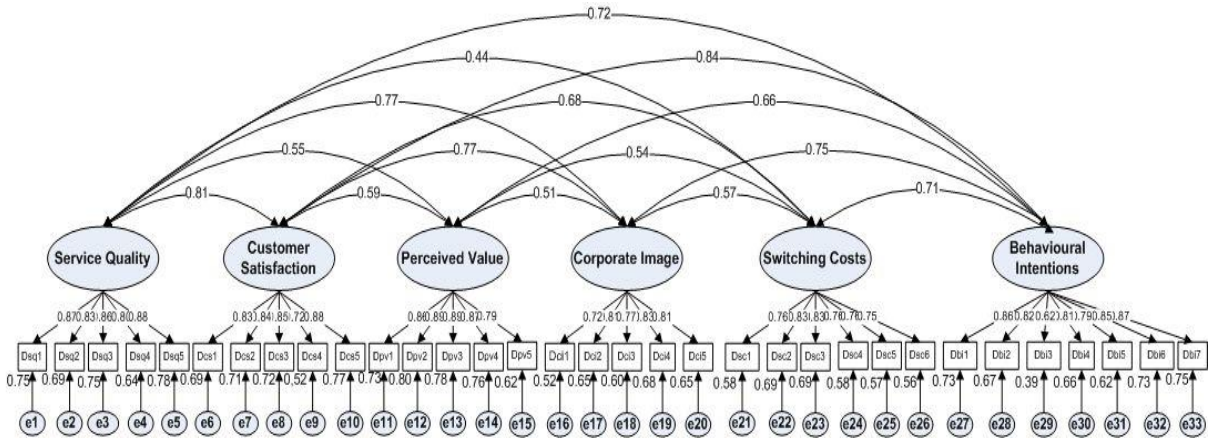
#### 5.5.2.9 The Measurement Model for the Six Higher-Order Constructs

As shown in Figure 5.15, the preliminary first-order model for the six constructs was intended to assess the relationships between service quality, customer satisfaction, perceived value, corporate image, switching costs, and behavioural intentions together with their observed indicators. The preliminary model contains 33 items that resulted in 561 pieces of information **(**33 [33+1] 2 = 66**)** and 81 estimated parameters (27 regression weights, 15 covariances and 39 variances); the model was over-identified with 480 *df* (561 pieces of information - 81 parameters) (Kline, 2011; Byrne, 2010).

All the standardized factor loadings are well above the cut-off point of 0.50 (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988), ranging from 0.62 to 0.89. All items were statistically significant at the 0.001% level, initially indicating unidimensionality among the items (see Figure 5.15).

The results shown in Figure 5.15 demonstrate that the model has a relatively good fit since most goodness-of-fit indices are within their recommended thresholds, i.e., RMSEA = 0.060, SRMR = 0.0582, TLI = 0.931, $\chi^2$/df = 1.896, CFI = 0.938, and PGFI = 0.698. The exceptions are the chi-square, which is significant ($\chi^2$ = 909.842, df = 480, P = 0.000, *N*= 251) and the GFI = 0.816. Although the model has a relatively good fit and the standardized parameter estimates were all significant (p<0.001), the preliminary model needed modification to further enhance the result of goodness-of-fit indices especially the low GFI (0.816). Therefore, further detailed assessment of modifications was conducted.

**Figure 5.15: The Model (CFA) for the Six Higher-Order Constructs**




$\chi^2$: 909.842, df: 480, GFI: 0.816, RMSEA: 0.060, SRMR: 0.0582, CFI: 0.938, TLI: 0.931, $\chi^2$/df: 1.896, PGFI: 0.698

First, an assessment of the standardized residuals was performed. The matrix shows that several residual values were greater than 2.58 (Janssens et al., 2008; Schumacker & Lomax, 2004). Further examination of the modification index (MI) indicated a few items had an MI greater than 3.84 and large expected change estimates of EPC (MacKenzie et al., 2011). In addition to the standardized residuals and MI, the goodness-of-fit of the model, the reliability and validity, and the number of items in the constructs were considered simultaneously. Accordingly, a preliminary first-order model for the six higher-order constructs was re-specified six times, as shown in Table 5.32, because of the unacceptably high values of MI and standardized residual covariance.

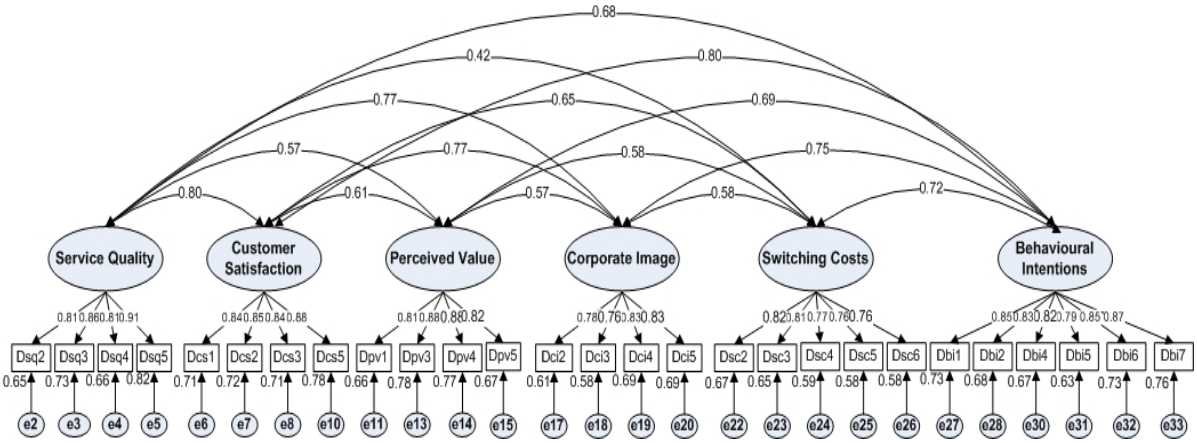
**Table 5.32: The Deleted Six Higher-Order Construct Items**

| Item Coding | Attribute | Reason for deletion |
|---|---|---|
| Dcs4 | I feel delighted with the services and products delivered by the XYZ Bank. | MI: 41.627 (with SC), R |
| Dpv2 | The XYZ Bank offers the best deposit interest rates. | MI: 26.019 (with Dpv1) |
| Dci1 | The XYZ Bank has a good reputation. | MI: 17.494 (with Dbi1) |
| Dsc1 | To change to another bank involves investing time in searching for information about other banks. | MI: 15.833 (with Dbi7) |
| Dsq1 | I believe that the XYZ Bank provides superior services in every way. | MI: 10.717 (with Dbi) |
| Dbi3 | I would encourage friends and acquaintances to do business with the XYZ Bank. | MI: 14.713 (with Behavioural Intentions) |

*Note: R: Standardized residual covariance >2.58, MI: Modification index for error term correlation*

The removal of the items Dcs4, Dpv2, Dci1, Dsc1, Dsq1, Dbi3 did not significantly change the conceptualised content of the constructs because the essential aspects of the constructs are captured by the remaining items. In addition, their removal comprises less than 20% of the items (Hair et al., 2010). Hence, four to six items remained for each construct in the final model (see Figure 5.16).

**Figure 5.16: The Modified Model (CFA) for the Six Higher-Order Constructs**




$\chi^2$: 485.012, df: 309, GFI: 0.877, RMSEA: 0.048, SRMR: 0.0438, CFI: 0.967, TLI: 0.963

$\chi^2$/df: 1.570, PGFI: 0.717

The final model for the six higher-order constructs model presented 27 items that generated 378 pieces of information (27 [27+1]/2 = 378); the number of estimated parameters was p = 69 parameters (21 regression weights, 15 covariances and 33 variances); the model was over-identified with 309 *df* (378 pieces of information - 69 parameters) (Kline, 2011; Byrne, 2010).

The final model shows that the standardized factor loadings were statistically significant at the 0.001% level ranging from 0.76 to 0.91. All factor loadings were greater than 0.70 (see Table 5.34), and all observable indicators loaded significantly on their respective construct. The *t*-values were all above 2.00 (see Table 5.34), thus adequate evidence of convergent validity is initially provided (Hair et al., 2010; Anderson & Gerbing, 1988).

Based on Table 5.33, Model III is the best fitting model among the modified models and is considered the "best" model for the six higher-order constructs. The goodness-of-fit indices were improved compared with the preliminary model, particularly GFI. The value for GFI improved from 0.816 to 0.877, and is close to the recommended 0.90 threshold (Hair et al., 2010; Schumacker & Lomax, 2004; Bentler, 1992). Except for the GFI, all are within their recommended threshold. However, this is acceptable because previous studies have found that the GFI is sensitive to sample size (see Section 5.5.2.1) (Sharma et al., 2005; Hu & Bentler, 1998; Miles & Shevlin, 1998; Bollen, 1990). Given that the majority of the fit indices indicate a good fit (see Figure 5.16), a GFI below 0.9 should be regarded as acceptable (Chang & Hsiao, 2008; Chen, 2008; Jöreskog & Sörbom, 1993). Thus, the

measurement model is considered relatively adequate because the model has an acceptable overall fit (Narayan et al., 2008).

**Table 5.33: The Improvement in the Fit of the First-Order Model for the Deleted Six Higher-Order Constructs**

| | Model | GFI | RMSEA | SRMR | CFI | $\chi^2$/df | PGFI |
|---|---|---|---|---|---|---|---|
| I. | Original Model | 0.816 | 0.060 | 0.0582 | 0.938 | 1.896 | 0.698 |
| II. | Deleting Dcs4, Dpv2, Dci1 | 0.851 | 0.054 | 0.0477 | 0.954 | 1.721 | 0.714 |
| III. | Deleting Dcs4, Dpv2, Dci1, Dsc1, Dsq1, Dbi3 | 0.877 | 0.048 | 0.0438 | 0.967 | 1.570 | 0.717 |

The CFI index is 0.967, above the recommended threshold of 0.90, indicating that the measurement model for the six constructs demonstrates adequate unidimensionality (Sureshchandar et al., 2001). The improvement in the model fit was also examined by subtracting the overall $\chi^2$ statistics for the modified model from those of the preliminary model. Comparing the preliminary model ($\chi^2_{[480]}$ = 909.842) with the modified model ($\chi^2_{[309]}$ = 485.021) yielded a difference in the $\chi^2$ value of 424.821 ($\Delta\chi^2_{[171]}$ = 424.821). Since ($\Delta\chi^2_{[171]}$ = 424.821) > $\chi^2_{202.5125,\alpha\ .05}$, the modified first-order model was statistically significant and indicated an improvement in the model-fit indices (Hair et al., 2010; Iacobucci, 2010; Jöreskog, 1993; Bentler, 1990; Bollen, 1989).

The construct reliability (CR) and average variance extracted (AVE) were computed to verify the convergent validity (Fornell & Larcker, 1981). The CR for each of the six constructs was greater than the 0.70 cut-off value, ranging between 0.878 and 0.933 (see Table 5.34), indicating high internal consistency of the measurement scales (Hair et al., 2010; Bagozzi & Yi, 1988; Fornell & Larcker, 1981).

All AVE values also exceed the minimum criterion of >0.50, ranging between 0.617 and 0.732, suggesting that all the constructs have captured a relatively high level of variance and adequate convergence (MacKenzie et al., 2011; Hair et al., 2010; Segars, 1997; Bagozzi & Yi, 1988; Fornell & Larcker, 1981). Both the CR and AVE results signify that the reliability and validity of each construct are supported, therefore convergent validity is achieved (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988; Nunnally, 1978).

**Table 5.34: The Reliability and Validity Tests of the First-Order Model for the Six Higher-Order Constructs**

| Construct | Indicator | Factor Loading | CR | AVE | Construct | Indicator | Factor Loading | CR | AVE |
|---|---|---|---|---|---|---|---|---|---|
| Service | Dsq2 | 0.808*** | 0.910 | 0.717 | Corporate | Dci2 | 0.780*** | 0.878 | 0.642 |
| Quality | Dsq3 | 0.857*** | | | Image | Dci3 | 0.762*** | | |
| | Dsq4 | 0.811*** | | | | Dci4 | 0.830*** | | |
| | Dsq5 | 0.906*** | | | | Dci5 | 0.831*** | | |
| Customer | Dcs1 | 0.841*** | 0.916 | 0.732 | Switching | Dsc2 | 0.822*** | 0.889 | 0.617 |
| Satisfaction | Dcs2 | 0.850*** | | | Costs | Dsc3 | 0.806*** | | |
| | Dcs3 | 0.845*** | | | | Dsc4 | 0.770*** | | |
| | Dcs5 | 0.885*** | | | | Dsc5 | 0.763*** | | |
| Perceived | Dpv1 | 0.814*** | 0.911 | 0.719 | | Dsc6 | 0.764*** | | |
| Value | Dpv3 | 0.881*** | | | Behavioural | Dbi1 | 0.853*** | 0.933 | 0.699 |
| | Dpv4 | 0.879*** | | | Intentions | Dbi2 | 0.826*** | | |
| | Dpv5 | 0.817*** | | | | Dbi4 | 0.818*** | | |
| | | | | | | Dbi5 | 0.791*** | | |
| | | | | | | Dbi6 | 0.854*** | | |
| | | | | | | Dbi7 | 0.871*** | | |

*CR= Construct Reliability (> 0.70); AVE= Average Variance Extracted (> 0.50)*
*** Statistically significant at the 0.001 level (t > 3.291)
** Statistically significant at the 0.01 level (t > 2.576)
* Statistically significant at the 0.1 level (t > 1.645)

Discriminant validity also exists between all the constructs (Figure 5.16). This evidence on the CFA results reveals that the correlation coefficient estimates of all the pairs of the six constructs are below 0.85. As convergent validity and discriminant validity are satisfied, construct validity is also achieved (Bollen, 1989; Fornell & Larcker, 1981; Bagozzi, 1980).

Kline (2011) suggests that if the researcher's model is reasonably correct, then one should see the following pattern of results: (1) all indicators specified to measure a common factor have relatively high standardized factor loadings on that factor (i.e., > 0.70); and (2) estimated correlations between the factors are not excessively high (i.e., < 0.90 in absolute value). The first result indicates convergent validity; the second, discriminant validity. The modified measurement model of the six higher-order constructs (Model III) satisfactorily meets both criteria as well as satisfying the recommended threshold established for model-fit indices. Hence, the model was used for further analysis i.e., the structural model.

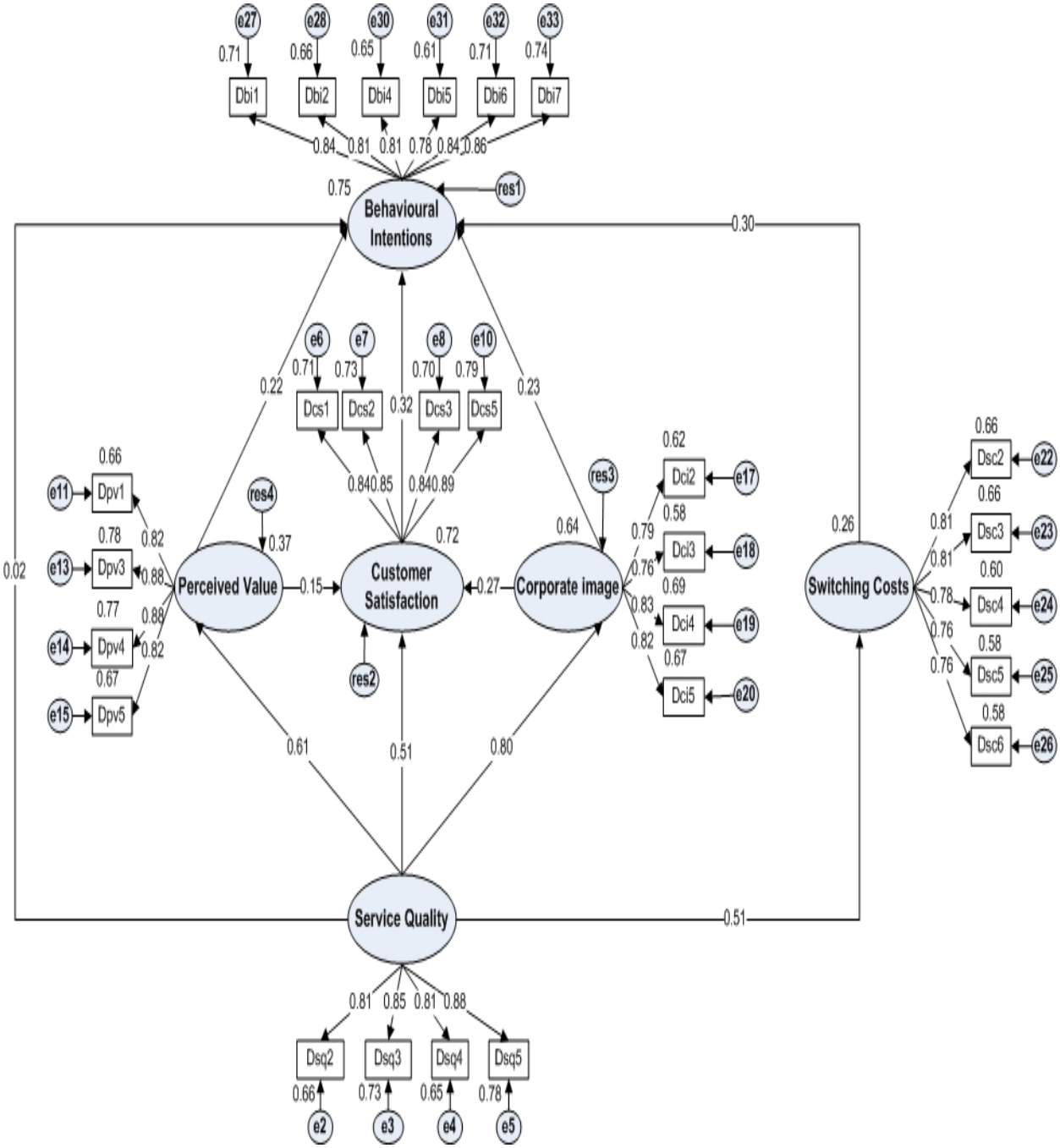
#### 5.5.2.10 The Structural Model

After confirmation of the model for the six higher-order constructs, the structural model was developed to investigate the interrelationships between the six constructs (see Figure 5.17). The structural model is the final step involved in SEM and was used to test Hypotheses H8 to H18 in order to satisfy Research Objective 3. In this model, service quality is categorised as an exogenous (independent) construct, whereas customer satisfaction, perceived value, corporate image, switching costs and behavioural intentions can be both endogenous (dependent) and exogenous constructs, depending on the direction of the arrow. An arrow pointing to a construct is considered endogenous whereas an arrow coming from a construct is considered exogenous (Byrne, 2010; Hair et al., 2010). The structural model contains 27 items that result in 378 pieces of information (27 [27+1] 2 = 378) and 65 estimated parameters (32 regression weights, and 33 variances). Based on the t-rule, the structural model is over-identified with 313 *df* (378 pieces of information – 65 parameters) (Byrne, 2010).

All the standardized factor loadings are well above the cut-off point of 0.50 (Nunnally & Bernstein, 1994; Bagozzi & Yi, 1988), ranging from 0.76 to 0.89. All items are statistically significant at the 0.001% level, initially indicating unidimensionality among the items (see Figure 5.17). Figure 5.17 shows that the model is a relatively good fit because most goodness-of-fit indices are within their recommended thresholds: i.e., RMSEA = 0.058, SRMR = 0.081, CFI = 0.951, TLI = 0.945, $\chi^2$/df = 1.853, and PGFI = 0.709. The exceptions are chi-square, which is significant ($\chi^2$ = 580.044, df = 313, P = 0.000, *N*= 251), and GFI = 0.856 which is close to the suggested 0.90 threshold. This is acceptable since both the chi-square and the GFI are sensitive to sample size (see Section 5.5.2.1 and Section 5.5.2.7) (Bagozzi & Yi, 2012; Chin et al., 2008; Hu & Bentler, 1999).

To counter the size effect drawback of the significant chi-square, it is necessary to rely on other goodness-of-fit indices to assess model fit (MacKenzie et al., 2011). In terms of the GFI, Sharma et al. (2005) recommend that the GFI index should not be used. However, the GFI is often reported in covariance structure analyses because of its historical importance (Hooper et al., 2008). Based on the goodness-of-fit indices as well as the fact that all parameter estimates are significant ($p<0.001$), model modification for the structural model was not required. Accordingly, the result from testing the structural model is acceptable and the model can be considered as a fit model. The relationships between the constructs as reflected in the hypotheses statements are shown in Table 5.35.

**Figure 5.17: The Structural Model of Behavioural Intentions in Malaysian Retail Banks**




$\chi^2$: 580.044, df: 313, GFI: 0.856, RMSEA: 0.058, SRMR: 0.081, CFI: 0.951, TLI: 0.945, $\chi^2$/df: 1.853, PGFI: 0.709

**Table 5.35: The Standardized Causal Effects of the Structural Equation Model and Hypotheses Assessment**

| Outcome | Determinant | Standardized Coefficient Paths ( $\beta$ ) | | Hypotheses | Assessment |
|---|---|---|---|---|---|
| | | Direct Path | Critical Ratio | | |
| Behavioral Intentions ($R^2$ = 0.751) | Service Quality | 0.019 | 0.182 (0.856) | H10a | Not Supported |
| | Customer Satisfaction | 0.323 | 3.651*** | H18 | Supported |
| | Perceived Value | 0.217 | 3.970*** | H14 | Supported |
| | Corporate Image | 0.231 | 2.775** | H16 | Supported |
| | Switching Costs | 0.303 | 5.853*** | H15 | Supported |
| Customer Satisfaction ($R^2$ = 0.725) | Service Quality | 0.515 | 5.402*** | H8 | Supported |
| | Perceived Value | 0.150 | 2.680** | H13 | Supported |
| | Corporate Image | 0.275 | 3.222** | H17 | Supported |
| Perceived Value ($R^2$ = 0.370) | Service Quality | 0.608 | 9.251*** | H9 | Supported |
| Corporate Image ($R^2$ = 0.643) | Service Quality | 0.802 | 12.522*** | H12 | Supported |
| Switching Costs ($R^2$ = 0.259) | Service Quality | 0.509 | 7.349*** | H11 | Supported |

Note: Statistically significant at *** = .001(t > 3.291); ** = .01(t > 2.576); * = 0.10(t > 1.645)

Table 5.35 presents the results of the direct effects of exogenous constructs on the five endogenous variables (i.e., behavioural intentions, customer satisfaction, perceived value, corporate image, and switching costs) that were hypothesized in the structural model, together with the outcomes of the hypothesis testing. Hypotheses H10a, H14, H15, H16, and H18 were formulated to test the relationships between service quality, perceived value, switching costs, corporate image, and customer satisfaction (exogenous constructs) on customers' behavioral intentions (endogenous construct).

The outcome of the hypothesis testing reveals that the five exogenous constructs explain 75% of the variance of the behavioural intentions (endogenous variable). The most important direct determinant of behavioural intentions is customer satisfaction, with a value of standardized beta *($\beta$)* = 0.323, statistically significant at the 0.001% level with a 3.651 critical ratio. The second most important is switching costs ($\beta$ = 0.303), which is statistically significant at the 0.001% level with a 5.853 critical ratio. This is followed by corporate image ($\beta$ = 0.231) and perceived value ($\beta$ = 0.217), which are statistically significant at the 0.01% level and 0.001% level, respectively. The critical ratio for corporate image is 2.775 and for perceived value is 3.970. Except for Hypothesis 10a, all the hypotheses established (H14, H15, H16, H18) were significant. The exception is because the relationship between service

quality and behavioural intentions was found not to be statistically significant ($\beta$ = 0.019) resulting in Hypothesis 10a not being supported.

Hypotheses 8, 13, 17 were established to test the interrelationships between service quality, perceived value, and corporate image (exogenous constructs) on customer satisfaction (endogenous construct). The hypothesis testing reveals that the three exogenous constructs explain 72% of the variance in customer satisfaction. The most important direct determinant of customer satisfaction is service quality, with a value of $\beta$ = 0.515, statistically significant at the 0.001% level with a 5.402 critical ratio. Next is corporate image ($\beta$ = 0.275), which is statistically significant at the 0.01% level with a 3.222 critical ratio, followed by perceived value ($\beta$ = 0.150), which is statistically significant at the 0.01% level with a 2.680 critical value. All three hypotheses (H8, H13 and H17) are supported.

Hypothesis 12 was formulated to test the relationship between service quality (exogenous construct) and corporate image (endogenous construct). Service quality explains 64% of the variance of corporate image. Service quality has a direct effect of $\beta$ = 0.802 on corporate image, statistically significant at the 0.001% level with a 12.522 critical ratio. Thus, Hypothesis 12 is supported.

Hypothesis 9 was formulated to test the relationship between service quality (exogenous construct) and perceived value (endogenous construct). Service quality explains 37% of the variance of perceived value. Service quality has a direct effect of $\beta$ = 0.608 on perceived value, statistically significant at the 0.001% level with a 9.251 critical ratio. Thus, Hypothesis 9 is supported.

Hypothesis 11 was formulated to test the relationship between service quality (exogenous construct) and switching costs (endogenous construct). Service quality explains 26% of the variance of switching costs. Service quality had a direct effect of $\beta$ = 0.509 on switching costs, statistically significant at the 0.001% level with a 7.349 critical ratio. Thus, Hypothesis 11 is supported.

#### 5.5.2.11 The Direct and Indirect Effects of the Variables

AMOS 18 provides output results on the decomposition of effects; the direct, indirect and total effects of the path analysis, based on the structural model analysis (Figure 5.17). The direct effects are those influences unmediated by any other variable in the model, whereas the indirect effects are mediated by at least one intervening variable (MacKinnon & Fairchild, 2009; Frazier, Tix, & Barron, 2004; Baron & Kenny, 1986). The indirect effect is

quantified by *a* x *b* (*ab*) where: P→M[26] path (a) and the M→O[27] path (b) (MacKinnon & Fairchild, 2009; Preacher & Hayes, 2008; Preacher & Hayes, 2004). The total effect is equal to the sum of the direct and indirect effects (MacKinnon & Fairchild, 2009; Preacher & Hayes, 2008).

**Table 5.36: The Direct, Indirect and Total Effects of the Constructs**

| Antecedents Constructs | Effect | Endogenous Constructs | | | | |
|---|---|---|---|---|---|---|
| | | Corporate Image | Perceived Value | Switching Costs | Customer Satisfaction | Behavioural Intentions |
| Service Quality | Direct | 0.802 | 0.608 | 0.509 | 0.515 | 0.019 |
| | Indirect | - | - | - | 0.312 | 0.738 |
| | Total | 0.802 | 0.608 | 0.509 | 0.827 | 0.758 |
| Corporate Image | Direct | - | - | - | 0.275 | 0.231 |
| | Indirect | - | - | - | - | 0.089 |
| | Total | - | - | - | 0.275 | 0.320 |
| Perceived Value | Direct | - | - | - | 0.150 | 0.217 |
| | Indirect | - | - | - | - | 0.049 |
| | Total | - | - | - | 0.150 | 0.265 |
| Switching Costs | Direct | - | - | - | - | 0.303 |
| | Indirect | - | - | - | - | - |
| | Total | - | - | - | - | 0.303 |
| Customer Satisfaction | Direct | - | - | - | - | 0.323 |
| | Indirect | - | - | - | - | - |
| | Total | - | - | - | - | 0.323 |

Table 5.36 shows the important results on the direct, indirect and total effects that provide insights into the relationships between service quality, corporate image, perceived value, switching costs, and customer satisfaction on particular endogenous constructs. Firstly, a comparison of the total effects indicates that among the significant, direct determinants of behavioural intentions, customer satisfaction (0.323) has the greatest effect, followed by corporate image (0.320), switching costs (0.303), and perceived value (0.265). In turn, service quality (0.738) has an indirect relationship on behavioural intentions. However, there

[26] P refers to the predictor variable and M refers to the mediator variable.
[27] O refers to the outcome variable.

is no indirect effect for corporate image (0.089) or perceived value (0.049) on behavioural intentions.

Secondly, with respect to customer satisfaction, based on total effects, service quality is the greatest determinant of customer satisfaction with a value of 0.827 compared with corporate image (0.275) and perceived value (0.150). Service quality has an indirect effect on customer satisfaction (0.312) through perceived value and corporate image.

Thirdly, the findings reveal that service quality is an important determinant of several constructs with the total effect ranging between 0.509 and 0.827. Service quality is an important driver influencing corporate image (0.802), perceived value (0.608), switching costs (0.509), customer satisfaction (0.827), and behavioural intentions (0.758). Although it has no direct effect on behavioural intentions as hypothesized in H10a, service quality has a high indirect effect on behavioural intentions (0.738) through customer satisfaction, corporate image, switching costs, and perceived value.

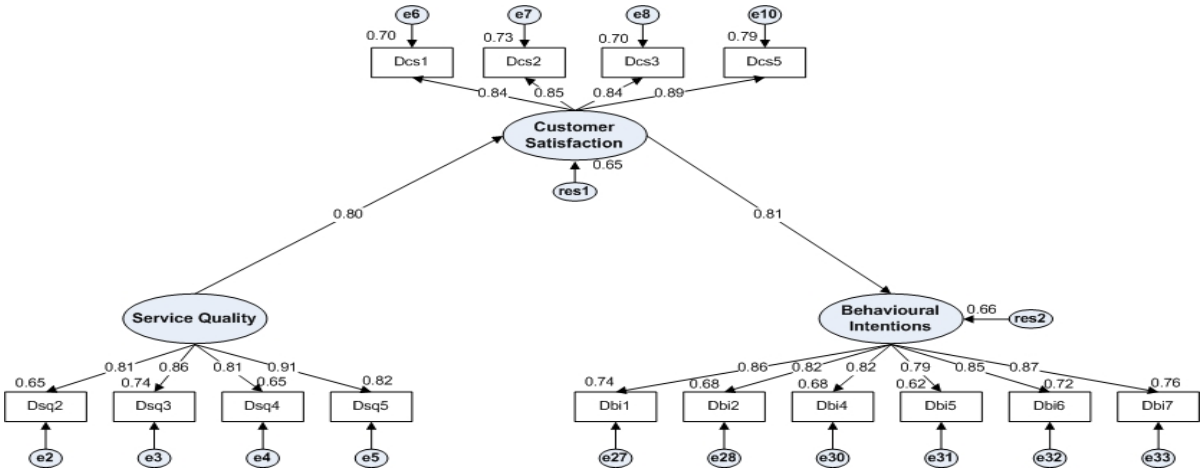
### 5.6 Testing the Mediation Effect

The results of the indirect effects (Table 5.36) provide evidence of the existence of a mediation effect on the relationship between service quality and behavioural intentions. As per hypothesis H10b (see Chapter 3), this study has tested the indirect (i.e. mediation) effect of customer satisfaction on the service quality and behavioural intentions relationships using SEM (Frazier et al., 2004; Holmbeck, 1997). Figure 5.18 (Model 1) shows that the model tests the mediation role of customer satisfaction on the relationship between service quality and behavioural intentions. Most of the goodness-of-fit indices of the model are within their recommended thresholds, i.e., RMSEA = 0.049, GFI = 0.939, SRMR = 0.0356, CFI = 0.984, TLI = 0.981, $\chi^2$/df = 1.612, and PGFI = 0.671 indicating that the model is an adequate fit. The exception is chi-square, which is significant ($\chi^2$ = 120.917, df = 75, P= 0.001, *N*= 251). The coefficient paths between service quality and customer satisfaction ($\beta$ = 0.80, t = 14.294) and between customer satisfaction and behavioural intentions ($\beta$ = 0.81, t = 14.038) are significant at the 0.001% level.

Figure 5.19 (Model 2) shows that the coefficient path between service quality and behavioural intentions ($\beta$ = 0.68, t = 11.316) is significant at the 0.001% level. However, as shown in Figure 5.20 (Model 3), the coefficient path between service quality and behavioural intentions ($\beta$ = 0.12, t = 1.377) becomes non-significant when customer satisfaction (M) is included in the model. In this case, there is full mediation (Hair et al., 2010; Frazier et al., 2004; Baron & Kenny, 1986). According to Hoyle and Smith (1994), the mediation role of

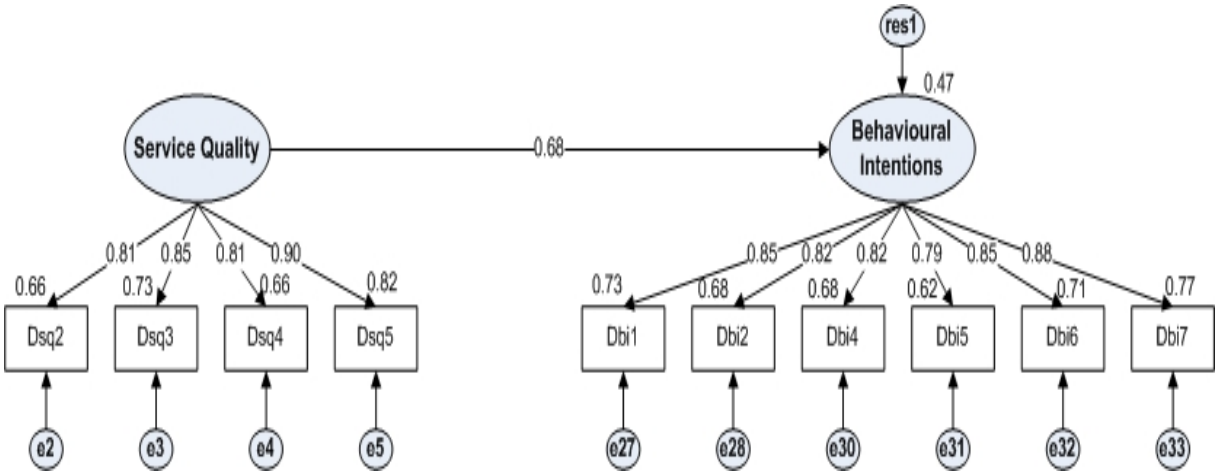
the M variable is supported if the predictor-outcome path is zero (non-significant) when the mediator is added to the model. The results confirm that customer satisfaction (M) mediates the relationship between service quality and behavioural intentions (Hair et al., 2010). Thus, Hypothesis H10b is supported.

**Figure 5.18: The Mediation Effects of Customer Satisfaction on Service Quality and Behavioural Intentions (Model 1)**



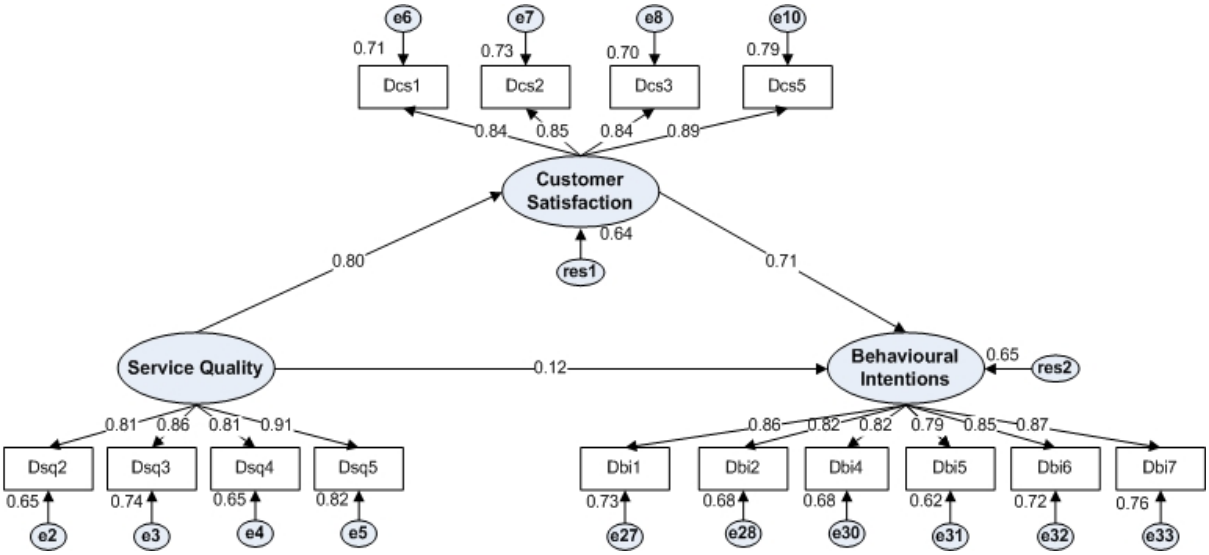

$\chi^2$: 120.917, DF: 75, GFI: 0.939, RMSEA: 0.049, SRMR: 0.0356, CFI: 0.984, TLI: 0.981, $\chi^2$/df: 1.612, PGFI: 0.671

**Figure 5.19: The Mediation Effects of Customer Satisfaction on Service Quality and Behavioural Intentions (Model 2)**




$\chi^2$: 49.556, DF: 34, GFI: 0.963, RMSEA: 0.043, SRMR: 0.0304 CFI: 0.992, TLI: 0.989, $\chi^2$/df: 1.458, PGFI: 0.595

**Figure 5.20: The Mediation Effects of Customer Satisfaction on Service Quality and Behavioural Intentions (Model 3)**




$\chi^2$: 119.093, DF: 74, GFI: 0.939, RMSEA: 0.049, SRMR: 0.0323, CFI: 0.985, TLI: 0.981, $\chi^2$/df: 1.609, PGFI: 0.662

## 5.7 Summary

This chapter has tested all 18 hypotheses outlined in Chapter 3. The three research objectives are satisfied using EFA and SEM (CFA and structural analysis). EFA was used to identify 14 subdimensions of service quality. CFA was used to test the reliability and validity of all constructs involved, which is considered the most crucial part in SEM. All paths in the conceptual research model were subsequently tested using structural analysis. In addition, the direct, indirect and total effects were presented and the mediating effect among the constructs was also discussed. A summary of the findings of the hypothesis tests are displayed in Table 5.37.

## Table 5.37: Summary of the Findings

| Hypotheses | | Result |
|---|---|---|
| H1: | There is a significant positive relationship between the subdimensions of interaction quality (i.e. H1a, H1b, H1c, H1d and H1e) and the interaction quality primary dimension. | *Supported,* interaction quality is comprised of five subdimensions (attitude, behaviour, expertise, problem solving, and information), a first-order model. |
| H2: | There is a significant positive relationship between the subdimensions of physical environment quality (i.e. H2a, H2b, H2c, and H2d) and the physical environment quality primary dimension. | *Supported*, physical environment quality is comprised of three subdimensions (ambient and equipment, physical appeal, and social factors), a first-order model. |
| H3: | There is a significant positive relationship between the subdimensions of outcome quality (i.e. H3a, H3b, H3c, H3d, H3e and H3f) and the outcome quality primary dimension. | *Supported,* outcome quality is comprised of six subdimensions: (waiting time, convenience, valence, security, privacy, and speed of decisions and responses), a first-order model. |
| H4: | There is a significant positive relationship between the interaction quality primary dimension and retail bank customers' overall service quality perceptions. | *Supported*, interaction quality has a strong influence on overall service quality perceptions, second-order model. |
| H5: | There is a significant positive relationship between the physical environment quality primary dimension and retail bank customers' overall service quality perceptions. | *Supported*, physical environment quality has a medium influence on overall service quality perceptions, second-order model. |
| H6: | There is a significant positive relationship between the outcome quality primary dimension and retail bank customers' overall service quality perceptions. | *Supported*, outcome quality has a strong influence on overall service quality perceptions, second order model. |
| H7a: | Customers will vary in their perceptions of the importance of each of the primary dimensions. | *Supported*, interaction quality being the most important of the primary dimensions followed by outcome quality and physical environment quality. |
| H7b: | Customers will vary in their perceptions of the importance of each of the subdimensions. | *Supported*, information, physical appeal and privacy are the strongest indicators of interaction quality, physical environment quality and outcome quality, respectively. |
| H8: | Higher perceptions of service quality positively affect customer satisfaction. | *Supported*, service quality has a medium influence on customer satisfaction |
| H9: | Higher perceptions of service quality positively affect customer perceived value. | *Supported*, service quality has a medium influence on customer perceived value. |
| H10a: | Higher perceptions of service quality positively affect favourable behavioural intentions. | *Not supported*, service quality has no influence on behavioural intentions. |
| H10b: | Higher perceptions of service quality indirectly affect favourable behavioural intentions through customer satisfaction. | *Supported*, service quality has indirect (full mediation) influence on behavioural intentions through customer satisfaction. |
| H11: | Higher perceptions of service quality positively affect perceived switching costs. | *Supported*, service quality has a medium influence on perceived switching costs. |
| H12: | Higher perceptions of service quality positively affect perceived corporate image. | *Supported*, service quality has a strong influence on corporate image. |
| H13: | Higher customer perceived value will positively affect customer satisfaction. | *Supported*, perceived value has a weak influence on customer satisfaction. |
| H14: | Higher customer perceived value will positively affect behavioural intentions. | *Supported*, perceived value has a small influence on behavioural intentions. |
| H15: | Higher perceived switching costs will positively affect behavioural intentions. | *Supported*, switching costs has a moderate influence on behavioural intentions. |
| H16: | Higher perceptions of corporate image will positively affect favourable behavioural intentions. | *Supported*, corporate image has a small influence on behavioural intentions. |
| H17: | Higher perceptions of corporate image will positively affect perceptions of satisfaction. | *Supported*, corporate image has a small influence on satisfaction. |
| H18: | Higher perceptions of customer satisfaction will positively affect customers' behavioural intentions. | *Supported*, customer satisfaction has a moderate influence on behavioural intentions. |

# Chapter 6
# Discussion and Conclusions

This chapter reviews the findings of this study and draws conclusions based on the results presented in Chapter 5. The theoretical and managerial implications, study limitations and recommendations for future study are also discussed.

## 6.1 Discussion

The following sub-sections discuss the results of the 18 hypotheses tested to satisfy the research objectives presented in Chapter 1. The discussion focuses on the dimensionality of service quality pertaining to the multidimensional and hierarchical model of service quality, followed by a discussion of the interrelationships among the six important marketing constructs (service quality, customer satisfaction, customer perceived value, corporate image, perceived switching costs, and behavioural intentions).

## 6.2 The Dimensionality of Service Quality

Although there is general agreement that service quality has many dimensions (Prentice 2013; Grőnroos, 1982, 1990; Parasuraman et al., 1985), there is no consensus on the exact nature and content of these dimensions (Brady & Cronin, 2001). This study proposes a multidimensional and hierarchical model of service quality in accord with the multilevel nature of perceptions suggested by Brady and Cronin (2001), to further explore the validity and reliability of service quality in the context of the retail banking industry in Malaysia. Several researchers have tested a comprehensive model in different settings such as mobile communications (Clemes et al., 2014; Lu et al., 2009), mobile health (Akter et al., 2013), the airline industry (Wu & Cheng, 2013), sports spectators (Clemes et al., 2011a), the motel industry (Clemes et al., 2011b), hairdresser and local phone services (Pollack, 2009), urgent transport services (Martínez Caro & Martínez García, 2007), the travel agency industry (Martínez Caro & Martínez García, 2008), higher education (Clemes et al., 2013, 2007), and health care (Dagger et al., 2007), and found strong supporting evidence for the multidimensional and hierarchical nature of service quality.

The empirical results of this current study also confirm service quality as a multidimensional and hierarchical construct as perceived by the customers of the retail banks represented in the sample. These results are also consistent with a recent study by Hossain et

al. (2014) who developed and tested multidimensional and hierarchical constructs for service quality for retail banks in Bangladesh and Australia.

Three primary dimensions, station quality, interaction quality and outcome quality were identified in the Hossain et al. (2014) study. However, the authors incorporate corporate image as one of the subdimensions for station quality, whereas in the majority of the literature, the majority claimed that service quality acts as a main driver or antecedent for corporate image (Clemes et al., 2014, 2013; Wu, Lin, & Hsu, 2011; Hu et al., 2009; Lu et al., 2009; Aydin et al., 2005; Wang et al., 2003; Bloemer et al., 1998; Nguyen & LeBlanc, 1998; Zeithaml et al., 1996). As well, Hossain et al. (2014) model considers "price" under the subdimension of 'tactical benefit' for outcome quality. However, Anderson et al. (1994), notes that service quality does not generally depend on price and Dabholkar et al., (1996) also contend that price is not part of the generally accepted understanding, of service quality. Price is usually viewed as a determinant of service value. It is further noted that, the construction of the instruments or items for the subdimensions is ambiguous as they were not appropriately validated. A pre-test was not conducted as it should have been, in order to improve face validity and content validity of the initial version of the survey instrument. Also exploratory factor analysis (EFA) was not performed to identify the underlying factors that represent the subdimensions of service quality. The pre-test and exploratory factor analysis are important because several items used by Hossain et al. (2014) were directly taken from field study. Finally, Hossain et al. (2014) used the partial least squares (PLS), whereas this current study uses covariance-based SEM for hypothesis testing and path modelling, because this study uses a large sample size, and the subdimensions are reflective indicators of the primary dimension.

In this current study, the initial hypothesised models were modified (see Sections 5.5 to 5.5.2.10). Subsequently, the findings confirmed that service quality of the retail banks represented in the sample is a hierarchical/multilevel construct with three underlying primary dimensions: interaction quality, physical environment quality and outcome quality, reflected in 14 underlying subdimensions. Based on the CFA results, interaction quality is reflected by attitude, behaviour, expertise, problem solving and information subdimensions. The physical environment quality is reflected by ambient and equipment, physical appeal, and social factor subdimensions. Outcome quality is reflected by waiting time, convenience, valence, security, privacy, and speed of decisions and responses subdimensions. The combination of all these evaluations represents a customer's overall perception of retail bank service quality. The results confirm that customers assess service quality on several levels to reach their overall

service quality evaluation (Clemes et al., 2014; Lu et al., 2009; Brady & Cronin, 2001). Therefore, Research Objective 1 is satisfied since the results of this study support H1 to H6.

The findings reveal that interaction quality (ß = 0.91) is the most important indicator in measuring the overall perceptions of retail bank service quality as perceived by the customers of the retail banks represented in the sample. This finding is consistent with Hossain et al. (2014) and Karatepe et al. (2005) who measured bank customers' perceptions of service quality in Bangladesh and Australia, and northern Cyprus, respectively. Clemes et al. (2014) reported the same result in the Chinese mobile communications industry. In contrast, studies in other various settings such as sports spectators (Clemes et al., 2011a), the motel industry (Clemes et al., 2011b), hairdresser and local phone services (Pollack, 2009), urgent transport services (Martínez Caro & Martínez García, 2007), and higher education (Clemes et al., 2013), reported outcome quality as having the strongest influence on service quality.

Outcome quality (ß = 0.88) is the second most important indicator of service quality, followed by physical environment quality (ß = 0.62). Interestingly, the present study reveals that outcome quality is an important dimension for retail bank's service quality, contrary to the SERVQUAL instrument findings in which service outcomes were not explicitly considered (Richard & Allaway, 1993; Mangold & Babakus, 1991; Grőnroos, 1990).

This study also found that the physical environment quality is an important indicator of service quality. Many researchers have noted that customers rely on extrinsic cues to form and assess their service quality perceptions (Brady & Cronin, 2001; Aubert-Gamet & Cova, 1999; Dabholkar et al., 1996; Baker, Grewal, & Parasuraman, 1994; Bitner, 1990; Grőnroos, 1990).

However, compared with the interaction and outcome qualities, the physical environment quality is less important to customers of the retail banks represented in the sample. A similar tendency has been observed in previous studies where the tangible elements were viewed by bank customers as significant but less important (Ladhari et al., 2011a; Karatepe et al., 2005; Malhotra et al., 2005; Wang et al., 2003). According to Sphatis, Petridou, and Glaveli (2004), the tangible elements of service are a prerequisite today and therefore do not have a strong influence on perceptions. In addition, the current results are consistent with Matilla (1999) who claimed that Asian customers are less likely to depend on tangible cues from the physical environment for evaluating service quality, than their Western counterparts.

The present results suggest that customers of the retail banks represented in the sample place more emphasis on the interaction and outcome qualities. This agrees with Parasuraman et al. (1985) study, who claim the conceptualization of service quality should include both service delivery and service outcomes (Lehtinen & Lehtinen, 1991). Bank customers of the retail banks represented in the sample tend to be concerned more with the intangible nature of the service, i.e., the commitment, attentiveness, friendliness, care and courtesy attributes (Najjar & Bishu, 2006), than the physical and tangible attributes. Nevertheless, to create superior service quality, banks must consider the three primary dimensions (i.e. interaction quality, physical environment quality, outcome quality) with extra attention given to the intangible elements (interaction and outcome qualities). The findings on the dimensionality structure of service quality and the importance of each of the subdimensions are discussed in the following subsections.

### 6.2.1 Interaction Quality

Based on the CFA results, all five subdimensions (attitude, behaviour, expertise, problem solving, information) are significantly, positively related to the interaction quality primary dimension, thus supporting Hypothesis 1 and partially satisfying Research Objective 1. This indicates that bank customers evaluate their perceptions of interaction quality by assessing the five subdimensions. Information (ß = 0.92) is the strongest indicator of interaction quality, followed by problem solving (ß = 0.89), behaviour (ß = 0.88), expertise (ß = 0.82) and attitude (ß = 0.81), thus supporting Hypothesis 7b and partially satisfying Research Objective 2.

Consistent with the results of the focus group discussions, the findings suggest that all five subdimensions are important, with the information subdimension the main driver of interaction quality for retail bank service. Previous studies also reveal that information largely influences service quality perceptions (Lu et al., 2009; Lassar et al., 2000). The current results indicate that customers prefer to be kept up-to-date by their banks for all banking transactions with which they are involved. For instance, in the case of a mortgage or personal loan, a customer must be updated by the bank from time to time on the progress of the loan application. In addition, all fees and charges involved must be discussed and revealed upfront at an early stage. Any new products or services offered by the bank must be known and explained clearly to customers. Overall, bank customers expect transparency, clarity, and updated information from the bank. Therefore, bank managers may have to reassess how they disseminate information to their customers. A bank should concentrate its

efforts on facilitating customers' information searches through all available channels, in order to make customers feel they have the power to make decisions on any matter. Banks may even encourage greater self-service through financial comparison sites and financial planning tools.

In this study, the problem solving subdimension is the second most important indicator in measuring customers' perceptions of interaction quality. The current results confirm there is a positive, significant relationship between bank staff members' problem solving skills and interaction quality. A few other studies also reveal that problem solving skills highly influence interaction service quality in multiple service industries (Clemes 2014; Clemes et al., 2011b; Lu et al., 2009; Martínez Caro & Martínez García, 2008, 2007), and they are also recognized as important drivers of service quality (Swanson & Kelley, 2001; Dabholkar et al., 1996; Hart et al., 1990). The results suggest that customers of the retail banks represented in the sample are quite sensitive to how banks address problems. The concern is about how effectively and supportively the bank handles customer service problems.

The positive behaviour of a bank's staff is the third most important indicator in measuring customers' perceptions of interaction quality. The behaviour subdimension represents an evaluation of how the service is performed by staff (Adlaigan & Buttle, 2002) and can significantly influence customers' perceptions and assessments of service quality (Brady & Cronin, 2001; Winsted, 2000; Bitner, 1990; Gronroos, 1990). Among the items viewed as important by bank customers are "bank staff first greet customer" and "give personal attention to the customer".

The expertise subdimension is the fourth most important indicator in this study in measuring customers' perceptions of interaction quality. The result suggests that the expertise of bank personnel is the degree to which the interaction is affected by staff knowledge about the bank's services and products, as well as demonstrating efficient banking skills. The literature supports this factor as a subdimension of interaction quality for other services (Clemes et al., 2013; Pollack, 2009; Martínez Caro & Martínez García, 2008, 2007; Clemes et al., 2007; Arasli et al., 2005a; Brady & Cronin, 2001).

The attitude subdimension is the fifth most important indicator in measuring customers' perceptions of interaction quality. Bank staff members' attitudes are defined in terms of professional attributes such as friendliness, patience, helpfulness, and consistent courteousy. A few studies in banking have revealed that staff attitude is highly important in determining a bank's perceived service quality (Al-Hawari & Ward, 2006; Yavas et al., 2004;

Bahia & Nantel, 2000). Positive attitudes from bank staff help to create a good first impression for first time customers, as well as being an important factor in retaining existing customers. In turn, these personal traits may influence customer satisfaction.

Ultimately, interaction quality is crucial since previous studies show that staff who are not customer oriented or well-trained can adversely affect the customer experience (Getz et al., 2001). In fact, current results suggest that customers want bank staff to be competent, to possess thorough banking skills, to be knowledgeable, helpful and polite, to understand their needs, to respect them as individuals and to provide clear and understandable information. These attributes are significantly important aspects of interaction quality, and these findings emphasize the continuing importance of the staff in providing banking services (Ladhari et al., 2011a). Although Malaysian banks are now transforming themselves into modern banks with more 'high tech' facilities, the identification of a dimension that is 'high touch' (characterised by personal connectivity) shows that personal contact still needs to be included. In fact, 'high touch' in a service delivery is more relevant in developing countries rather than a 'high tech' approach (Malhotra et al., 2005).

### 6.2.2 Physical Environment Quality

The current results of the measurement model for the physical environment quality confirm that there are significant positive relationships between the three subdimensions (ambient and equipment, physical appeal, social factors) and the physical environment quality primary dimension. This supports Hypothesis 2 and partially satisfies Research Objective 1. The present results suggest that among the three subdimensions, physical appeal (ß = 0.82) is the most important physical environment quality dimension, followed by ambient and equipment (ß = 0.79), with the least important being social factors (ß = 0.50). This supports Hypothesis 7b and partially satisfies Research Objective 2.

The results agree with the results of the focus group discussions conducted for this study and with the results of the empirical studies, and show that physical appeal is the main driver of the physical environment quality. Previous studies also support the relationship between the physical appeal subdimension and the physical environment quality primary dimension (Clemes et al., 2014; Clemes et al., 2007; Martínez Caro & Martínez García, 2007; Ko & Pastore, 2005; Brady & Cronin, 2001). The current results suggest that items such as the physical facilities need to be attractive and comfortable, with a professional layout and furniture arrangements, and professional interior design. These items are significant physical appeal items.

The ambient and equipment subdimension is the next most important indicator in measuring customers' perceptions of the physical environment quality. Although the findings of this current study suggest that the ambient and equipment subdimension has a significant positive relationship with the physical environment quality primary dimension, this result is inconsistent with the results of the focus group discussions in which participants identified two separate subdimensions: "ambient conditions" and "equipment". Both these subdimensions are correlated and were formed as a new subdimension "ambient and equipment" due to the EFA, which was further confirmed by CFA. This suggests that retail bank customers consider the two dimensions "ambient conditions" and "equipment" as one dimension. Conversely, Pollack (2009), Martínez Caro and Martínez García (2008), Al-Hawari and Ward (2006), and Ko and Pastore (2005), found that "ambient conditions" and "equipment" are separate subdimensions.

The findings further signify that ambient conditions such as the adequacy of space, attractiveness from outside, temperature, noise level and comfortable environment to do business in, are important and positively influence customers' perceptions of retail banks' service quality. Prior studies also show that ambient conditions are important indicators of the physical environment quality (Martínez Caro & Martínez García 2008; Al-Hawari & Ward, 2006; Ko & Pastore, 2005; Brady & Cronin, 2001; Bahia & Nantel, 2000). Besides ambient conditions, items such as the bank having modern equipment, having easily accessible ATMs, and having ATMs that are always working, significantly contribute to the ambient and equipment subdimension of the physical environment quality. This suggests that modern equipment such as ATMs, and cash and cheque deposit machines, are important (i.e., for use by walk-in customers) and may influence retail bank customers' service quality perceptions of the physical environment of the retail banks represented in the sample. Thus, banks have to ensure that their machines are built to a high technical level giving a high level of accuracy in a short amount of time for each transaction. Also, ATMs must be able to operate extended hours, i.e. 24 hours. Obviously, ATMs serve as support to their traditional banking (over-the-counter service) providing convenience.

In this study, the social factors subdimension is the least important indicator in measuring customers' perceptions of the physical environment quality, although the current result confirms that there is a significant positive relationship between social factors and the physical environment quality. This result is consistent with the output from the focus group discussions and previous service quality studies (Clemes et al., 2014, 2013, 2011a, 2007, Chahal & Kumari, 2010; Pollack, 2009; Brady & Cronin, 2001). The influence that other

customers may have on a customer's service experiences have been noted by several researchers (Grove & Fisk, 1997; Lovelock, 1996; Lehtinen & Lehtinen, 1991; Bitner, Booms, & Tetreault, 1990). The current results, however, indicate that customers of the retail banks represented in the sample view social factors as a less important factor in forming their perceptions of physical environment quality. This result indicates that the Malaysian customers represented in the sample are not disturbed by the presence of other customers during their personal banking transactions. Nevertheless, banks must ensure they offer a stable environment for their customers as only a relatively small reduced level of social factors may negatively influence the perceived level of service quality.

### 6.2.3 Outcome Quality

In terms of outcome quality, six subdimensions (waiting time, convenience, valence, security, privacy, speed of decisions and responses) were found to be significant and positively related to outcome quality, thus supporting Hypothesis 3 and partially satisfying Research Objective 1. The results indicate that retail bank customers evaluate their perceptions of outcome quality by assessing the six subdimensions. The results further reveal that privacy (ß = 0.89) was the strongest subdimension in measuring customers' perceptions of retail bank outcome quality. This was followed by security (ß = 0.85), convenience (ß = 0.83), speed of decisions and responses (0.83), valence (ß = 0.82) and finally, waiting time (ß = 0.80), thus supporting Hypothesis 7b and partially satisfying Research Objective 2.

Empirically, in this study, the privacy subdimension is the most important indicator of customers' perceptions of outcome quality. Initially, the privacy dimension was part of the "security and privacy" dimension, which was consistent with the results of the focus group discussions. However, based on the EFA results, "security and privacy" were separated into two subdimensions: "privacy" and "security" and this was confirmed by the CFA. The current result demonstrates that there is a significant positive relationship between privacy and outcome quality. Previous studies reveal that the privacy factor is an important dimension of service quality in various industries (Clemes et al., 2014; Vlachos & Vrechopoulos, 2008; Parasuraman, Zeithaml, & Malhotra, 2005) including banking (Lassar et al., 2000; Ennew et al., 1993). Parasuraman et al. (2005) suggest that privacy deals with a sense of feeling safe when a customer's personal information is shared with the service provider, whereas security involves the protection of customers from fraud and financial loss (Zeithaml, Parasuraman, & Malhotra, 2002) as well as safety from bank robbers.

The current findings indicate that bank customers heavily focus on privacy criteria when dealing with a bank. Thus, a bank must respect the privacy concerns of its customers, given the high level of importance of the privacy dimension in customers' perceptions of outcome quality. Recently, it was thought that customers' information had been sold, especially to the marketing departments of banks (Kheng et al., 2010). Selling customers' information to third parties without their consent is a major offence. Such selling could jeorpadise a bank's credibility and customer trust towards their bank. Banks must assure their customers that they have the best, most reliable security systems in place, as well as highly trusted staff, to protect their customers' personal information. Ultimately, banks have to instil confidence among customers that they uphold the highest privacy and confidentiality levels.

In this study, the security subdimension is the second most important indicator of outcome quality. This result confirms that there is a significant positive relationship between security and the outcome quality. Numerous previous studies also reveal that the security factor is an important dimension of service quality (Lassar et al., 2000; Ennew et al., 1993). In banking, security is an important factor because, according to Johnston (1997), security is the personal safety of the customer and his or her possessions, while participating in or benefiting from the service process. The result shows that the Malaysian customers of the retail banks represented in the sample, care that their resources are being kept safe by trustworthy and highly credible banking institutions.

In Malaysia, with the introduction of the Deposit Insurance System in 2005, all deposits are protected and insured automatically by the Malaysia Deposit Insurance Corporation (MDIC). This system was introduced to safeguard customers from financial loss and to increase the security feeling among all bank customers. The coverage limit is RM250,000 per depositor per member institution (i.e., all commercial and Islamic banks, including foreign banks operating in Malaysia). Additionally, feeling safe while carrying out banking transactions inside a bank is equally important. As a financial service provider, a bank must inspire a feeling of security by, for instance, deploying extra security guards during business hours and by being well equipped with the latest security systems.

The convenience subdimension and the speed of decisions and responses subdimension are equally important and are ranked third equal as the most important indicators in measuring retail bank customers' perceptions of the outcome quality. The current result confirms that there is a significant positive relationship between the convenience subdimension and the outcome quality primary dimension. This is consistent with the results of the focus group discussions and the findings of Culiberg and Rojšek

(2010), Yavas et al. (2004), and Wang et al. (2003), whose studies reveal that the convenience factor is an important dimension of bank service quality. The current study shows that customers require sufficient, suitable operating hours, convenient branch locations, a variety of transactions available at the ATMs, and clear guidance and information for using bank services and facilities. Although bank services are moving on-line, many customers still visit branches looking for the convenience aspect (Culiberg & Rojšek, 2010). Thus, the convenience dimension is an important factor and is supported by previous research (Culiberg & Rojšek, 2010; Yavas et al., 2004; Wang et al., 2003). Recently, many banks have taken steps to improve this aspect by opening branches in major shopping malls and public hot spots. Some branches are operating seven days a week. Banks have made all these changes with the intention of enhancing the convenience of their service.

The result also confirms that there is a significant positive relationship between the speed of decisions and responses subdimension and the outcome quality primary dimension. However, the speed of decisions and responses subdimension, includes "reliability" as a result of the EFA, and as confirmed by CFA, which is inconsistent with the results of the focus group discussions. The CFA results suggest that Malaysian retail bank customers represented in the sample consider the two dimensions, reliability, and speed of decisions and responses, as one dimension. In contrast, previous studies have noted that reliability is a stand-alone subdimension in determining overall bank service quality (Dash, Bruning, & Acharya, 2009; Glaveli, Petridou, Liassides, & Spathis, 2006; Karatepe et al., 2005; Bahia & Nantel, 2000). In the Malaysian environment, Amin and Isa (2008) report that, "reliability" is the most important dimension of service quality for Islamic banks. The result is also supported by the findings of Karatepe et al. (2005) who determined that "empathy" and "reliability" were the second- and third-most important determinants of overall bank service quality in northern Cyprus. In Canada, Dash et al. (2009) reported that Canadian bank customers attach a high level of importance to reliability. Similarly, responsiveness has been shown in several studies to be an important dimension in bank service quality (Tahir & Abubakar, 2007; Beerli et al., 2004; Wang et al., 2003). The current results indicate that bank customers represented in the sample expect efficient feedback, performance to a high standard, and error-free, prompt, timely, and efficient service. The speed of decisions and responses subdimension reflects the willingness or readiness of staff to provide services immediately to customers. Ultimately, a smooth bank service is the main criterion that customers expect.

In this study, the valence subdimension is the fourth most important indicator of outcome quality. To date, no empirical study has identified valence as an important subdimension of service quality in the banking industry.Valence captures the attributes that control whether customers believe that the service outcome is good or bad, regardless of their evaluation of any other aspect of the experience (Martínez Caro & Martínez García, 2007; Ko & Pastore, 2005; Brady & Cronin, 2001). Valence in the banking context, refers to what customers perceive about the service encounter regardless of, say, an unsuccessful loan application. The present results confirm that the outcome quality primary dimension is positively related to the valence subdimension. This result is consistent with the results of the focus group discussions and research by Lu et al. (2009); Pollack (2009); Martínez Caro and Martínez García (2008, 2007); Ko and Pastore (2005); and Brady and Cronin (2001), whose findings reveal that the valence subdimension is one of the most important subdimensions pertaining to outcome quality in multiple industries.

The waiting time subdimension is the fifth most important indicator in measuring customers' perceptions of outcome quality. The result confirms that there is a significant positive relationship between waiting time and outcome quality. This is consistent with the focus group discussions, and previous studies have also showed that the waiting time factor is an important dimension of banking service quality (Glaveli et al., 2006; Bahia & Nantel, 2000). The current result suggests that during peak hours, increased numbers of open tellers are advantageous and will help to reduce long waiting times, long queues and delays. In addition, extra ATMs should be placed in busy branches and also banks should continue to develop and refine alternative banking channels and networks such as Internet banking and mobile banking, to overcome the waiting time issue. Queuing in Malaysia is expected, since queuing is an every-day phenomenon at some banks, especially in a big city like Kuala Lumpur (Munusamy et al., 2010). However, if the queuing situation changed, then the level of service quality as perceived by bank customers may change accordingly. All of these findings support Hypotheses 7a and 7b, thus satisfying Research Objective 2.

### 6.3 The Relationships between the Six Constructs

One of the objectives of this study (Research Objective 3), is to clarify the interrelationships between service quality, customer satisfaction, customer perceived value, corporate image, perceived switching costs, and behavioural intentions in the context of the Malaysian retail banking industry. All the relationships have been tested based on the

hypotheses developed in Chapter 3 (H8 to H18). The results derived from the structural equation model in Chapter 5 are further discussed in the following subsections.

### 6.3.1 Behavioural Intentions

In testing a range of potential determinants of behavioural intentions in retail banking, the findings of the present study confirm that customer satisfaction, perceived value, corporate image, and switching costs have strong direct relationships with behavioural intentions. The only exception is service quality. The determining constructs i.e. customer satisfaction, perceived value, corporate image and switching costs, explain 75% of the behavioural intentions' variance. The result provides empirical evidence for a multi-factor predictor of customer loyalty as proposed in the literature (Narteh, 2013b; Brunner, Stöcklin, & Opwis, 2008; Ehigie, 2006; Bloemer & Odekerken-Schroder, 2002). However, the degree of importance and the nature of the relationships between the constructs varies. The following discussion details the effect of service quality, customer satisfaction, perceived value, corporate image, and switching costs on behavioural intentions.

Based on the total effects results from the significant direct determinants of behavioural intentions, customer satisfaction (0.323) has the greatest effect, followed by corporate image (0.320), switching costs (0.303), and perceived value (0.265). The standardized coefficient path between customer satisfaction and behavioural intentions ß = 0.323, indicates that customer satisfaction has a positive significant effect on behavioural intentions, thus supporting Hypothesis 18. This finding is supported by previous studies that found a positive relationship between satisfaction and loyalty in retail banks (Amin et al., 2013; Narteh, 2013b; Baumann et al., 2012; Ladhari et al., 2011b; Lam & Burton, 2006; Ball et al., 2006; Veloutsou et al., 2004; Beerli et al., 2004; Hennig-Thurau, Gwinner, & Gremler, 2002; Moutinho & Smith, 2000; Hallowell, 1996). For example, Hallowell (1996) found a positive association between satisfaction and word-of-mouth and Veloutsou et al. (2004) found a positive relationship between satisfaction and behavioral intentions.

Hennig-Thurau et al. (2002) maintain that customer satisfaction is the immediate antecedent of customer loyalty. This is consistent with the current results that reveal customer satisfaction is a leading antecedent in determining the behavioural intentions of customers in the retail banks represented in the sample. This result suggests that the degree to which customers are satisfied with their banking experience plays a vital role in their loyalty to the bank because satisfied customers are more willing to repurchase the bank's products and

recommend the bank to others. Therefore, to improve behavioural intentions, a key factor is the intensity of customer satisfaction (Millan & Esteban, 2004).

The present study reveals that corporate image is the second construct to have a strong effect on behavioural intentions. The standardized coefficient path between corporate image and behavioural intentions is ß = 0.231, indicating corporate image has a positive significant effect on behavioural intentions, thus supporting Hypothesis 16. The present finding is consistent with other studies on services such as Clemes et al. (2014), Fathollahzadeh et al. (2011), Ladhari et al. (2011), Lewis and Soureli (2006), Hart and Rosenberger (2004), Ryan et al. (1999), and Andreassen and Lindestad (1998). The result is supported by previous conclusions that corporate image is an important driver of future intended repurchase behaviour (Hart & Rosenberger, 2004; Andreassen & Lindestad, 1998) and the intention to use particular banking services (Bravo, Montaner & Pina, 2012). A strong brand name, once built, can act as a switching barrier and motivate customers to resist competitor offerings (Kaur & Soch, 2013). The current result suggests that building a strong brand name that is perceived differently from other banks is a worthwhile investment. Hence, a good corporate image must be considered as a valuable strategic construct that can help retain customers in the long term.

This study also provides empirical support for the contention that switching costs have a positive, significant role in determining a customer's behavioural intentions towards the banks represented in the sample. The present study shows that switching costs have the third strongest effect on behavioural intentions. The standardized coefficient path between switching costs and behavioural intentions is ß = 0.303, indicating switching costs have a positive significant effect on behavioural intentions, thus supporting Hypothesis 15.

Previous studies by de Matos et al. (2013) and Beerli et al. (2004), demonstrate that both satisfaction and switching costs are important and significant loyalty antecedents in banking, and also contend that the influence of satisfaction is far greater than that of switching costs. Other researchers have also found that switching costs are an important determinant of behavioural intentions in other services (Clemes et al., 2014; Baumann et al., 2012; Burnham et al., 2003; Lam et al., 2004). The finding indicates that the higher the perceived switching costs, the more likely it is that customers will remain with their bank and that it will thus contribute to favourable behavioural intentions. Switching costs are recognized as an important driver of customer retention and often lead to stable, long-lasting relationships (Bansal et al., 2004; Burnham et al., 2003; Bendapudi & Berry 1997; Dick &

Basu 1994). Therefore, increasing switching costs may be beneficial strategy for banks, due to high level of competition in the Malaysian banking industry.

Further, the present study reveals that perceived value has a positive significant effect on behavioural intentions. The standardized coefficient path between perceived value and behavioural intentions is ß = 0.217, indicating perceived value has a positive significant direct effect on behavioural intentions, thus supporting Hypothesis 14. Previous studies on several industries also recognise the positive correlation between perceived value and the intention to purchase, or repurchase, and loyalty (Chen & Chen, 2010; Lai et al., 2009; Parasuraman & Grewal, 2000; Ryu, Han, & Kim, 2008).

Even though the present result confirms that perceived value has a positive effect on behavioural intentions, the construct is not considered a major predictor of behavioural intentions, as noted by earlier researchers (Petrick & Backman, 2002; McDougall & Levesque, 2000). This study shows that perceived value has the least effect on behavioural intentions compared with the other constructs (i.e., customer satisfaction, corporate image, and switching costs). This is consistent with previous studies that also found weak relationships between perceived value and loyalty in retail banks, as reported in India (Mittal & Gera, 2013) and Greece (Lewis & Soureli, 2006). The current result indicates that Malaysian retail bank customers represented in the sample also do not view perceived value as a key driver of favourable behavioural intentions. In fact, there are other constructs they perceive as more important reasons for remaining with the bank. A reason for this finding may be that customers perceive a more or less similar level of value (i.e., price) among the commercial banks. In Malaysia, pricing (i.e., interest, fees and charges) of certain key products and services is under the control of the central bank (Bank Negara Malaysia) and the Association of Banks in Malaysia (ABM), and it is compulsory for all banks to comply with their guidelines. This explains why most customers perceive that there is not much of a price difference in core products and services offered by the banks.

Nonetheless, the findings indicate that customers are willing to stay with a particular bank if the bank can deliver superior value relative to the offerings of its competitors. Conversely, when perceived value is low, the tendency to switch is high as customers today "are now increasingly prepared to switch providers if better value is available elsewhere" (Farquhar, 2004, p. 88). This is because customers tend to be reluctant to pay more for the services that their bank offers compared with other banks (Vera & Trujillo, 2013). Most importantly, the current findings provide additional support for the contention that perceived

value has a direct effect on behavioural intentions since the empirical evidence of this relationship in the banking literature is limited.

Finally, the empirical result reveals that service quality does not have a significant direct effect on behavioural intentions. This result signifies that a direct impact does not exist, even though bank customers perceive high service quality in the service delivered, which contradicts several previous studies in banking (Choudhury, 2013; Ladhari et al., 2011b; Mandhachitara & Poolthong, 2011; Baumann et al., 2007; Koutouvalas & Siomkos, 2006; Lam & Burton, 2006; Karatepe et al., 2005; Bloemer et al., 1998)[28]. The result reveals, however, that service quality has a significant indirect effect (0.738) on behavioural intentions through customer satisfaction, perceived value, corporate image and switching costs. Even though there is no direct effect between service quality and the behavioural intentions, constructs such as customer satisfaction, perceived value, corporate image, and switching costs play a critical role in enhancing the relationship. Clearly, this current study support the notion that perceived service quality affects behavioural intentions only indirectly (Bei & Chiao, 2001; Boulding et al., 1993; Cronin & Taylor, 1992). This is important because previous studies have produced inconsistent results whereby several researchers suggest that service quality could affect customer behavioural intentions either directly, indirectly or both. According to Ladhari et al. (2009b, p. 323), "It would seem that the significance of these direct and indirect influences might depend on the particular service setting under investigation".

Further, customer satisfaction was confirmed as a mediator between service quality and behavioural intentions, thus supporting Hypothesis 10b. As discussed in Section 5.6, the standardized coefficient path between service quality and behavioural intentions ($\beta = 0.12$, $t = 1.377$) becomes non-significant when customer satisfaction (M) is included in the model. The current results reveal that customer satisfaction has significant and full mediation effects on the relationship between service quality and behavioural intentions (i.e., SQ→SAT→BI) (Hair et al., 2010; Frazier et al., 2004; Baron & Kenny, 1986). These results are also consistent with other empirical studies on various industries (Ladhari et al., 2011b; Mosahab et al., 2010; Lai et al., 2009; Bei & Chiao, 2006; Ehigie, 2006; Lam & Burton, 2006; Caruana, 2002; Brady & Robertson, 2001) and highlight that customer satisfaction performs a crucial intervening role in the relationship between service quality and behavioural intentions (i.e. mediating effect). The results suggest that customers who perceive a higher

[28] The effect of mediating is not tested in these studies except studies by Ladhari et al. (2011b) and Bloemer et al. (1998).

level of service quality will definitely not engage in behavioural intentions unless they are satisfied with their bank's services. Therefore, by providing superior service quality, it will enhance customer satisfaction and it will more likely lead to positive intentions, such as word-of-mouth recommendations and the intention to do more business with the bank. The results not only highlight the importance of customer satisfaction, they also provide a more comprehensive understanding of the customer satisfaction effect on both service quality and behavioral intentions.

Finally, although there is no direct relationship between service quality and behavioural intentions, service quality still plays a vital role in influencing behavioural intentions. This is because as shown in this study, service quality acts as an important antecedent for customer satisfaction, perceived value, corporate image, and switching costs which in turn, influence behavioural intentions. Given the importance of service quality, banks need to strengthen each of the service quality dimensions: i.e. interaction quality, physical environment quality and outcome quality, in order to generate excellent service quality.

### 6.3.2 Customer Satisfaction

Since customer satisfaction has the strongest direct effect on behavioural intentions, it is important to learn what drives customer satisfaction as suggested by Caruana (2002, p. 823). The empirical results of this study reveal that service quality, perceived value and corporate image are important antecedents of customer satisfaction; they explain 72% of the customer satisfaction variance. The current result is supported by several studies, for instance, McDougall and Levesque (2000) who report that service quality and perceived value are significant drivers of customer satisfaction across four service industries (restaurants, auto services, hairstylists and dental services). However, the degree of importance and the nature of the relationships between these variables varies. Among the three constructs proposed in this study, service quality has the strongest effect on customer satisfaction followed by corporate image and perceived value. The results in this study demonstrate that service quality is the most important determinant of customer satisfaction, followed by corporate image and perceived value. Studies on various industries by Clemes et al. (2014, 2013) and Fornell, Johnson, Anderson, Cha, and Bryant, (1996) also reveal that customer satisfaction is more quality driven than either perceived value or corporate image driven.

Specifically, the empirical result shows the standardized coefficient path for service quality is ß = 0.515, signifying that service quality has a positive direct effect on customer satisfaction, thus supporting Hypothesis 8. The findings of this study are consistent with those of prior studies on the banking industry in concluding that service quality is a significant determinant of customer satisfaction (Ladhari et al., 2011b; Mohd Kassim & Souiden, 2007; Al-Hawari & Ward, 2006; Arasli et al., 2005; Ndubisi & Wah, 2005; Grace & O'Cass, 2004; Zhou, 2004; McDougall & Levesque, 2000). For instance, Mohd Kassim and Souiden (2007) report a positive effect of service quality on satisfaction in the retail banking sector in the United Arab Emirates, and Arasli et al. (2005) report a similar relationship in the Greek Cypriot banking industry. The results of this study provide additional evidence that service quality is a major antecedent of satisfaction, thus indicating that customer satisfaction can be increased by delivering high-quality products and services (Ladhari et al., 2011b; Jamal & Anastasiadou, 2009). A bank needs to focus heavily on this relationship because satisfaction normally drives long-term customer relationships, and positive word-of-mouth reports (Amin et al., 2013; Amin et al., 2011) in turn contribute to bank profitability (Ladhari et al., 2011b).

The present study also reveals that corporate image is another important determinant of customer satisfaction for the retail banks represented in the sample. The standardized coefficient path between corporate image and customer satisfaction is ß = 0.275, indicating corporate image has a positive significant impact on customer satisfaction, thus supporting Hypothesis 17. The finding suggests that a good impression and image can enhance customer satisfaction for the banks represented in the sample. The positive effect of image on customer satisfaction is supported by several studies on other industries (Chen & Phou, 2013; Richard & Zhang, 2012; Lai et al., 2009; Palacio et al., 2002). The relationship between corporate image and customer satisfaction was also identified in an earlier study by Andreassen and Lindstead (1998). The finding of this present study provides an additional insight for the banking industry because studies on the linkage between image and satisfaction have received minimal attention in the banking literature. Conversely, a study by Clemes et al. (2014) found corporate image is not an important determinant of customer satisfaction in the Chinese mobile communications market. Their results indicate that even though a customer has a favourable image towards a service provider, it does not essentially mean that the customer is satisfied with the services provided.

Finally, perceived value is a determinant of customer satisfaction in the Malaysian retail banks represented in the sample. The standardized coefficient path between perceived

value and customer satisfaction is ß = 0.150, indicating perceived value has a positive significant but weak effect on customer satisfaction, thus supporting Hypothesis 13.

Consistent with this finding, Roig et al. (2013) and Bontis et al., (2007), concluded in their respective studies that perceived value is an antecedent of, and has a positive effect on, bank customer satisfaction in America and Spain, respectively. The current finding implies that across the three determinant constructs, perceived value is the weakest determinant of customer satisfaction because of the small effect shown. However, although customers do not consider perceived value to be a major predictor of their bank satisfaction, perceived value is still an important source of a company's competitive advantage (Korda & Snoj, 2010). As explained previously with regard to the relationship between perceived value and behavioural intentions (see Section 6.3.1), Malaysian customers find little relative difference between the price and costs offered by retail banks. Thus, customers of the retail banks represented in the sample see perceived value as a lesser influence on customer satisfaction.

### 6.3.3 Corporate Image

The present study confirms that service quality is an important determinant of corporate image in the Malaysian retail banks represented in the sample. The standardized coefficient path between service quality and corporate image is ß = 0.802, which is the strongest among the relationships tested in this study. Service quality explains 64% of the bank corporate image variance. The empirical finding of this study demonstrates that higher perceptions of service quality can positively affect a banks corporate image, thus supporting Hypothesis 12. This result implies that in order to develop a positive bank corporate image among Malaysian customers represented in the sample, it is essential for a bank to deliver superior service quality. A negative corporate image may easily increase perceived problems with service quality (Grőnroos,1984). The current result is supported by earlier studies by Wang et al. (2003) and Nguyen and LeBlanc (1998), who also concluded that superior bank service quality leads to an overall favourable bank corporate image. This relationship has also been empirically confirmed in other industry contexts such as hotels (Kandampully et al., 2011), higher education (Clemes et al., 2013), and mobile telecommunications (Clemes, et al., 2014; Lai et al., 2009; Aydin et al., 2005). Achieving a favourable bank corporate image is crucial, especially in this highly competitive industry where most competitors in the industry are offering similar services, and bank customers usually have difficulty in evaluating competing offerings. Emphasizing the quality of a bank's service delivery and the

professionalism of the staff to reflect a strong and consistent corporate image, should be encouraged (Bitner, 1992).

### 6.3.4 Perceived Value

Perceived value has been confirmed as an important source of a company's competitive edge (Korda & Snoj, 2010) and the findings of the present study show that service quality is an important predictor of perceived value. The standardized coefficient path between service quality and perceived value is ß = 0.608, which explains 37% of the perceived value variance. This suggests that service quality is an important determinant of perceived value. In fact, it is the second strongest among the relationships that were hypothesized in this study. Thus, Hypothesis 9 is supported. Contrary to the current results, however, a study by Vera and Trujillo (2013) concluded that service quality does not constitute a real source of superior customer perceived value in Mexican retail banks. However, the result for perceived value in this study is consistent with study findings in various service industries: mobile telecommunications (Clemes et al., 2014; Lai et al., 2009), higher education (Clemes et al., 2013), online shopping (Chang & Wang, 2011), life insurance (Gera, 2011), and public transit (Lai & Chen, 2011).

This finding signifies that, to achieve higher perceived value among their customers, retail banks should improve and maintain the quality of their service at the highest level. More importantly, perceived value as reported in Section 6.3.1, has a direct relationship with behavioural intentions. The current result provides further empirical evidence on the relationship between service quality and perceived value, a valuable result since this relationship has not been adequately investigated in the banking industry (Vera & Trujillo, 2013; Korda & Snoj, 2010).

### 6.3.5 Switching Costs

The empirical results of this study reveal that there is a significant positive relationship between service quality and perceived switching costs. The result further confirms that service quality is an important determinant of switching costs. Specifically, the standardized coefficient path between service quality and switching costs is ß = 0.509, which explains 26% of the switching cost variance, thus supporting Hypothesis 11. This finding indicates that the higher quality of retail bank service may help to act as a switching barrier, since it positively influences switching costs. This current result is also supported by the results from previous studies where a positive relationship was found between service quality

and switching costs in different contexts such as home-delivery services (Chou & Lu, 2009), any service provider (Meng & Elliot, 2009), and the mobile communications market (Clemes et al., 2014; Aydin et al., 2005). This shows that when the quality from a bank is perceived as higher, the costs to switch as perceived by customers of retail banks represented in the sample, are also higher. Licata and Chakraborty (2009) mention that if switching is inhibited, it is perhaps because of a perception that the costs to switch exceed the quality improvement expected from another service provider. Therefore, banks need to ensure that they deliver superior service quality relative to their competitors, to increase perceived switching costs, and to encourage bank customers to remain with the bank.

## 6.4 Implications

This section discusses the implications of this study from both a theoretical and managerial perspective.

### 6.4.1 Theoretical Implications

Several theoretical implications have been raised based on the findings reported in Chapter 5 and summarised in the previous discussion. The most important theoretical contribution of this study is in extending the body of services marketing literature with regard to the study of behavioural intentions in retail banks, particularly in the Malaysian context. As suggested by previous researchers (Ndubisi et al., 2009; Lewis & Soureli, 2006; Caruana, 2002) this study offers a more comprehensive and complex model of behavioural intentions. The theoretical model developed in this study is the first methodological initiative in banking studies to test all six important marketing constructs in a single framework simultaneously. This is an advance on the previous studies on banking, which have focussed on only a single linkage when examining the exact nature of the construct relationships (Bontis et al., 2007; Lewis & Soureli, 2006; Yang & Peterson, 2004). In addition this study identifies the key drivers of behavioural intentions in the banking industry from the perspective of a non-western country, in particular Malaysia.

The second theoretical contribution of this study is related to the role of customer satisfaction in mediating the service quality on behavioural intentions in the banking industry. While no direct link from service quality to behavioural intentions is present, the findings demonstrate that service quality has only an indirect influence on behavioural intentions. Unlike several studies on various industries that have found service quality to influence behavioural intentions directly (Choudhury, 2013; Baumann et al., 2007; Dagger et al., 2007;

Lobo et al., 2007; Petrick, 2004; Alexandris et al., 2002; Baker & Crompton, 2000; Cronin et al., 2000; Bloemer, de Ruyter, & Wetzels, 1999; Zeithaml et al., 1996; Rust & Zahorik, 1993), the current result provides support for the notion that customer satisfaction performs a mediating role in the relationship between service quality and behavioural intentions in banking (Caruana, 2002). This finding suggests that customers who perceive that their bank offers a high service quality may not automatically form the intention to remain with the bank, or to spread positive word-of-mouth comments. A bank may need to offer other incentives (loyalty programmes) to increase satisfaction. The implication of this finding is that the link between service quality and behavioural intentions is not a straight forward one. The relationship should include customer satisfaction as a mediating factor. This highlights the important role of customer satisfaction in terms of improving favourable behavioural intentions. The current findings for Malaysia are supported by several studies in the banking industry (Ladhari et al., 2011b; Manimaran, 2010; Mosahab et al., 2010; Bei & Chiao, 2006; Ehigie, 2006; Caruana, 2002).

The third theoretical contribution of this study is related to the relationships among the six constructs. The empirical evidence in this study demonstrates that customer satisfaction has a direct positive relationship with behavioural intentions and customer satisfaction is the strongest driver of behavioural intentions, followed by corporate image, switching costs, and perceived value. This study has also discovered that customer satisfaction is mainly influenced by perceptions of service quality, corporate image and perceived value. In the banking sector, it is very important to understand the factors leading to satisfaction, which will eventually lead to loyalty. This is because satisfied customers are more likely to concentrate their business with one bank (Reichheld, 1993). Further, switching costs, corporate image and perceived value are strongly influenced by service quality. Service quality can be viewed as the most important construct as found in this study because it represents the major driver of corporate image, perceived value, customer satisfaction and switching costs. Specifically, based on total effect, service quality has a strong influence on bank customer satisfaction, followed by corporate image, behavioural intentions, perceived value and switching costs. This finding suggests that service quality can be a source of competitive and sustainable advantage for a bank, because service quality dimensions are difficult to imitate, unlike the service range or products that can easily be replicated. Service quality therefore becomes a primary competitive weapon as banks have to compete among themselves with the generally undifferentiated and homogeneous products being offered (Mandhachitara & Poolthong, 2011; Kumar et al., 2010). The findings of this, current

research show that service quality, customer satisfaction, perceived value, corporate image and switching costs are the five key drivers of behavioural intentions and are confirmed in this study either directly or indirectly. The current study also extends the evidence on the relationships between all six constructs in the retail banking industry, particularly in Malaysia.

The fourth theoretical contribution of this study is related to the perceived value construct. A very limited amount of study has been undertaken to examine the antecedents and consequences of perceived value in banking (Vera & Trujillo, 2013; Korda & Snoj, 2010; Lewis & Soureli, 2006; Nguyen & LeBlanc, 1998). This study proposes a conceptual model that explicitly accounts for the affect of bank service quality on customer perceived value and its consequences, i.e., behavioural intentions to understand a comprehensive evaluation of a banking experience. The results of this study demonstrate that service quality is an important determinant of perceived value, and perceived value in turn, has a significant direct effect on behavioural intentions. Although the relationship between service quality, perceived value, and behavioural intentions has been widely acknowledged in previous studies, empirical evidence on this relationship within the banking context remains under-researched. Thus, the comprehensive conceptual model in this study makes a contribution to the extant literature on perceived value.

Ultimately, the comprehensive behavioural intentions path model from this study provides robust findings and offers better understanding, with the path model showing clearly the exact nature of relationships between the six marketing constructs examined, as suggested by Ehigie (2006) and Caruana (2002). Simultaneously, the model provides a holistic approach about the interrelationships involved among the six marketing constructs, since the model tested them in one single framework. The model may also serve as a useful framework and provide additional valuable insights for future researchers seeking to identify the antecedents of behavioural intentions or loyalty in banking, specifically in the Malaysian banking industry.

The fifth theoretical contribution of this current study is related to the confirmation of the multidimensional and hierarchical conceptualisation and measurement of service quality, in the Malaysian retail banks represented in the sample. The results of this study support the notion that service quality is multidimensional (Prentice, 2013) and is also in a hierarchical/multilevel form (Clemes et al., 2014; Hossain et al., 2014; Akter et al., 2013; Wu & Cheng, 2013; Lu et al., 2009; Pollack, 2009; Martinez García & Martinez Caro, 2007; Brady & Cronin, 2001; Dabholkar et al., 1996; Carman, 1990). The current results are crucial

because previous studies have produced scales that resemble SERVQUAL, a generic measure of service quality, which may not be totally adequate for assessing perceived service quality in banking (Ladhari et al., 2011a; Baumann et al., 2007; Petridou et al., 2007; Ibrahim, Joseph, & Ibeh, 2006; Arasli et al., 2005a; Jabnoun & Al-Tamimi, 2003). Additionally, previous researchers suggest that industry-specific research should be undertaken (Martinez García & Martinez Caro, 2010; Dabholkar et al., 1996; Kim & Kim, 1995). This study has captured customers' evaluations of service quality in an 82-item questionnaire exclusively adapted to the unique nature of banking in Malaysia. The results of the measurement model tests, indicate that all seven measurement models for measuring service quality and its dimensions have a good model fit after some modifications. Moreover, the results of the reliability and validity tests indicate that the measurement scales for measuring service quality and its dimensions are adequate. Thus, this study provides evidence that the multidimensional and hierarchical model developed adequately captures customers' perceptions of service quality in Malaysian retail banks represented in the sample.

The sixth theoretical contribution of this study pertains to the primary dimension of service quality in a Malaysian context as proposed in this study. Consistent with several service quality studies in retail banks (Hossain et al., 2014) and other industries (Clemes et al., 2014, 2013, 2011, 2010, 2007; Lu et al., 2009; Pollack, 2009; Brady & Cronin, 2001), the empirical analysis confirms that bank customers evaluate their overall perceptions of service quality by assessing three primary dimensions: interaction quality, physical environment quality and outcome quality. Of the three, interaction quality is the most important primary dimension of overall service quality, followed by outcome quality, and physical environment quality, as assessed by Malaysian retail bank customers represented in the sample. The current findings provide empirical evidence and support for numerous studies that claim interaction quality often has the greatest effect on customers' perceptions of service quality (Clemes, et al., 2014; Hossain et al., 2014; Hartline & Ferrell, 1996; Bitner & Hubbert, 1994; Grönroos, 1984) as well as outcome quality (Clemes, et al., 2013; Fullerton, 2005; Carman, 2000; McDougall & Levesque, 1994; Grőnroos, 1990). This suggests that bank customers' perceptions of service quality involve both the process-driven (how the service is delivered) and the outcome-driven (what a customer gets after the service delivery process and the buyer-seller interactions) aspects. The evaluation of "how" the service is performed is the most critical factor in the perception of overall bank service quality in this study. This is because banking services are generally purchased and consumed simultaneously and usually

require direct human contact, whereby customers and staff interact with each other. The consistent, dependable performance of bank staff is very important in this context.

Nevertheless, a bank should not underestimate the physical environment dimension although current findings demonstrate that intangibles please customers more than tangibles. However, a bank should emphasise the physical environment quality because it is a significant dimension contributing to overall bank service quality evaluation. The physical environment quality function has a supplementary role to interaction quality and outcome quality in forming an overall service quality judgement. In addition, in this study the overall items measuring service quality had mean distributions (see Section 5.4.1) of greater than four (out of seven) implying that bank customers are generally pleased with the quality of services rendered by the banks in the study.

The seventh and last theoretical contribution of the current research relates to the identification of new subdimensions for retail bank service quality in Malaysian banks represented in the sample. There are 14 subdimensions identified relating to the three primary dimensions of service quality in retail banks. All 14 subdimensions are highly important for customers to be able to perceive and evaluate service quality in the Malaysian retail banks represented in the sample. This study also presents the comparative importance of the 14 subdimensions in bank customers' service evaluations. Specifically, information is the most important subdimension of the interaction quality primary dimension. Physical appeal is the most important subdimension of the physical environment quality primary dimension, and privacy is the most important subdimension of the outcome quality primary dimension. All the subdimensions and the three primary dimensions in this study are subject to the features of the Malaysian retail bank industry represented in the sample and are not generic to all industries and cultures/countries. However, the three primary dimensions of bank service quality used are similar to those Brady and Cronin (2001) recommend. Ultimately, the findings of this study have expanded the research into service quality by providing a conceptual framework and measurement scale for retail banks.

### 6.4.2 Managerial Implications

From a managerial perspective, there are several important implications that can be obtained from the findings of this study. First, it is essential that managers identify the determinants of behavioural intentions since the construct is recognised as a key component for a company's long-term sustainability (Chen & Chen, 2010). Study has found positive links between customer loyalty and company profitability (Duncan & Elliot, 2002), implying

that any company with loyal customers has a considerable competitive advantage. Because of stiff competition in the banking industry characterized by rapid change and increasingly sophisticated customers, it is imperative that banks, particularly in Malaysia, focus mainly on bank customers' behavioural intentions that are pertinent to how to increase the customer retention rate.

The current results reveal that all five constructs: service quality, customer satisfaction, perceived value, corporate image, and switching costs, are five important key drivers of behavioural intentions, either directly or indirectly. The holistic model of behavioural intentions developed in this study has also revealed the exact nature of the complex relationships between service quality, customer satisfaction, customer perceived value, corporate image, perceived switching costs, and behavioural intentions. Thus, the model can assist bank managers to develop an appropriate customer retention strategy. As well, it works as a foundation for bank managers to examine and formulate their marketing strategy, relationship quality improvement activities, and value creation and loyalty programmes, in order to achieve long-term business sustainability. An integrated approach should be followed in the development of the overall bank marketing strategy, because all the constructs proposed in the model are interrelated.

Ultimately, in the highly competitive banking industry, this study should be particularly helpful for all Malaysian banking institutions because the model provides useful information for understanding the process of building and maintaining relationships with the bank customers. Additionally, in order to control the issue of customers' switching or defecting, it is imperative that banks periodically measure their customers' behavioural intentions' levels. The challenge for banks is to carefully manage the drivers of behavioural intentions better than their competitors. This is because market perception and customer expectations can change quickly from time to time. The transformation of traditional banking to electronic, internet banking and mobile banking, are rapidly occuring changes and perhaps there will be more new trends in the near future. For instance, in this study, satisfaction was identified as a strong predictor of behavioural intentions as well as acting as a significant mediator in the link between service quality and behavioural intentions. Thus, bank managers should monitor the progress of customer satisfaction levels among their customers to reduce situations earlier that could generate dissatisfaction (i.e. particularly in relation to constructs that have a strong influence on satisfaction, namely service quality, corporate image, and perceived value). The advantages for banks that are successful in managing customer behavioural intentions will be the long-term loyalty of valuable and valued, customers. At the

same time, such management will help ensure the better targeting of limited marketing resources.

Further, based on the previous discussion, service quality represents the utmost of importance for enhancing favourable behavioural intentions, and is considered to be a competitive edge for banks (Culiberg & Rojsek, 2010). This is because the current results suggest that delivering greater service quality could reinforce positive customer satisfaction, perceived value, bank corporate image and enhanced switching costs' assessments, which in turn leads to favourable behavioural intentions. Enhancing favourable behavioural intentions will untimately yield increased bank revenues and profits.

Thus, bank managers must not neglect the relevant service quality dimensions, and emphasis should be placed on improving bank service quality. Specifically, service quality is multidimensional and hierarchical as viewed by Malaysian bank customers represented in the sample, as suggested by Brady and Cronin (2001). The confirmation offered by the multidimensional and hierarchical model developed for this study, can give bank managers confidence in the information, and can therefore assist bank managers in gaining a clear understanding of how bank customers assess the quality of the service they provide.

Based on this model, assessment of service quality can be done at a particular quality dimensional level. First, if problems occur at the level of overall service quality, bank managers can assess at the primary dimension level, with the three primary dimensions of service quality confirmed in this study: (1) interaction quality, (2) outcome quality, and (3) physical environment quality. Next, if problems occur in one or more of the primary dimensions, the subdimensions for each problem area can be investigated (Clemes et al., 2014; Brady & Cronin, 2001). The model allows diagnosis and helps to narrow the problem areas. This step should ideally be completed constantly or at the very least once per year because it will provide insights to banks about what areas need to be improved or be maintained. In addition, the model also offers flexibility in assessing bank service quality. For instance, bank managers can opt to assess their service quality at all three levels, or they can broadly measure at an overall level, depending on their time and budget.

The multidimensional and hierarchical service quality model further suggests that to achieve the highest level of overall bank service quality, bank managers have to ensure superior delivery of interaction quality, outcome quality, and physical environment quality to customers. Accordingly, working to improve the areas of staff behaviour, information and knowlege levels, problem solving ability, expertise, and attitudes will result in a higher level of interaction quality. In terms of outcome quality, bank managers need to focus on the

privacy, security, speed of decisions and responses, convenience, valence, and waiting time aspects. Finally, the physical environment quality could be enhanced through physical appeal, ambient and equipment, and social factors.

The multidimensional and hierarchical framework developed for this study enables bank service providers to identify the most and least important dimensions underlying customers' perceptions of service quality. Given this information, banks can allocate their resources accurately. For instance, the current results reveal that interaction and outcome quality are the main contributors to overall bank service quality. Therefore, bank managers need to highlight and allocate more effort and resources to these two service quality dimensions because they are more important to customers. Attention should be placed on front desk staff who are responsible for everyday communication with customers.

Bank staff should be motivated and trained to understand customer needs, personalize services, provide individual attention, and generally demonstrate caring behaviour in all interpersonal dealings with customers (Ladhari et al., 2011b). In their behaviour towards customers, bank staff must see themselves in the customers' shoes and serve them in such a way as to keep them impressed with the service quality provided, and then to receive positive outcomes and great feedback in return. Also, bank staff should know how to direct bank customers to the right person, should answering customers' requests and solving customers' problems be outside their areas of knowledge and expertise. Although the model developed in this study is based solely on retail banking, the research results can be generalised to other banking segments including corporate banking and private banking. Likewise, other financial service providers can also gain benefit from this model.

### 6.4.3 Policy Implications

This study provides a clear perspective on what bank customers consider important as per quality and that the government may want to invoke a regulatory environment that ensures banks provide a certain level of quality much as they regulate money flows. The regulatory must not only be able to increase customer satisfaction, corporate image, perceived value, switching costs, and positive behavioural intentions but also build security and trust among the customers. For instance, this study highlights the importance of a feeling of safety in the transactions with the bank. In banking perspective, security involves the protection of customers from fraud and financial loss, therefore, government policy must highlights on the improvement of transparent processes and accountability. This study also discovers the importance or the continuance of branch banking as customers are still looking for

interpersonal relationships between customers and banking staff. Together with the policy on electronic banking, branch banking policy also needs to be upgraded and should not be neglected despite the electronic banking becomes more prevalent.

With a comprehensive policy it will offer great advantage to the customers, banking industries as well as economy as a whole because commercial banking plays a major role in the Malaysian economy as they provide a major source of financial intermediation (Mokhlis et al., 2009).

### 6.5 Limitations of the Study and Recommendations for Future Study

Although this study makes a contribution to the body of behavioural intentions literature, it has several limitations. These limitations mainly relate to the research design (i.e., the sampling method and data collection) and the model conceptual framework. After the discussion on the limitations of the current study, recommendations for future studies will be discussed.

First, this study depends primarily on samples drawn from customers of two commercial banks: Maybank and Public Bank. Although these two commercial banks hold the largest market share in the Malaysian banking industry, the samples obtained for this study do not fully represent all bank customers. As well, the sampling frame was limited to a geographical area covering the Klang Valley in Malaysia. For future studies, researchers should consider extending the geographical area to multiple geographical locations in Malaysia as well as sampling a number of commercial banks.

A second, limitation of this study is the use of convenience sampling (a non-probability sampling technique). According to Leary (2004), Reynolds et al. (2003), and Calder et al. (1981), convenience sampling is appropriate when the purpose of the study is testing theory. This current study tests the theory of the bank customers' behavioural intentions model and the relationships between the five antecedents of: service quality, customer satisfaction, perceived value, corporate image and switching costs, and therefore the use of convenience sampling is acceptable. Further, because of time and resource constraints, this study utilized the mall intercept approach and the non-probabilistic convenience sampling technique, which may have led to biases in the selection of respondents. To overcome the biases while selecting the samples, adequate care was taken in choosing respondents that best represent Malaysian retail bank customers.

Third, the primary dimensions and subdimensions of the multidimensional and hierarchical model developed to measure retail bank service quality in this study may not be applicable or generic to all service industries. Future researchers should identify their own specific service quality dimensions because each industry may have differing unique characteristics. However, replication of the hierarchical and multidimensional approach for conceptualising and measuring customers' perceptions of service quality as used in this study, is encouraged, in order to examine whether the model is applicable in other industries in Malaysia and other countries. Additionally, future researchers may also expand this study by comparing the relative importance of these subdimensions in various service industries and countries. Cultural, social and economic environmental differences should be considered when applying the current results to other countries.

Despite this study has examined the complex relationships between all six proposed constructs, there are some potential relationships that may be absent from the conceptual framework. For example, perceived switching costs have been identified as having a moderating effect on the relationship between customer satisfaction and customer loyalty (Dagger & David, 2012; Chebat, Davidow, & Borges, 2011; Aydin et al., 2005; Baumann et al., 2005; Bell et al., 2005; Lam et al., 2004; Patterson, 2004; Burnham et al., 2003; Patterson & Smith, 2003; Fornell, 1992). Also, perceived value has been shown to have a moderating effect on the relationship between service quality and customer satisfaction (Wang et al., 2004; Caruana et al., 2000). These relationships have not been explored in this study. Future studies on the banking industry should examine these relationships.

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# Appendices

## Appendix 1: Cover letter and Questionnaire

T 64 3 325 3838
F 64 3 325 3630
PO Box 84, Lincoln University
Lincoln 7647, Christchurch
New Zealand
www.lincoln.ac.nz

Dear Participant,

I am a Phd candidate at Lincoln University in Christchurch, New Zealand. My research project involves asking consumers about their perceptions of their experiences with the retail banking services in Malaysia. You are invited to participate in this survey.

Attached is a brief questionnaire that I am asking you to complete. The questionnaire will take about 10 to 15 minutes to be filled in. Instructions for completing the questionnaire can be found on the form itself. Please be assured that all information you provide will be kept **strictly anonymous and confidential**. Your name or other identifying information will not appear on any publication.

This research is completely voluntary in nature. However, in order to qualify for this research, you must have been a customer of a retail bank for at least three months and be at least eighteen years old. If you choose to complete the survey, it will be understood that you have consented to participate in the research project and to the publication of the results of the research. This research has been reviewed and approved by the Lincoln University Human Ethics Committee.

Kindly be informed that there are certain points beyond with which it will be impossible to withdraw from the research; i.e. after you have it submitted. Should you wish to withdraw, please do so before the submission of your questionnaire. Please return the completed questionnaire to the distributor immediately.

I will be pleased to discuss any concerns you have about your participation in the research. You can also contact my supervisors Mr. Michael D. Clemes and/or Dr. Ramesh Baskaran. Mr. Michael D. Clemes can be contacted at (0064 03) 3253838 (ext 8292) or Mike.Clemes@lincoln.ac.nz and Dr. Ramesh Baskaran can be contacted at (0064 03) 3253838 (ext 8344) or ramesh.baskaran@lincoln.ac.nz.

Again, your assistance and participation represents a valuable contribution that will contribute greatly to the success of my research. Each and every response is important and I appreciate your willingness to help. Thank you for your co-operation and assistance.

Yours sincerely,

Juhaida Abu Bakar
PhD Candidate
Commerce Division
Lincoln University
Contact number: (00264-3) 325-3838 ext 8403/ 010-5669220
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**A Survey of Behavioural Intentions in the Malaysian Retail Banking Industry: An Empirical Analysis**

**QUESTIONNAIRE**

**FOR LINCOLN UNIVERSITY POSTGRADUATE RESEARCH**

This questionnaire has five sections, A-E. Please answer all the questions. There are no right or wrong answers. Your spontaneous and honest response is important to the success of this research.

The following statements have been designed to obtain your opinion about several aspects of the ***XYZ Bank***. For each statement, please indicate the extent to which you agree or disagree with the statement by ticking (✓) an appropriate number on the seven point scale provided. If you strongly agree with the statement, tick 7; if you strongly disagree with the statement, tick 1.

| **SECTION A: Interaction Quality** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Statement** | **Strongly Disagree** | | | **Neutral** | | | **Strongly Agree** |
| **Attitudes** | | | | | | | |
| 1. The employees of the XYZ Bank are friendly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The employees of the XYZ Bank are patient. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The employees of the XYZ Bank are willing to help me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The employees of the XYZ Bank are consistently courteous. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The employees of the XYZ Bank have a positive attitude towards customer service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Behaviour** | | | | | | | |
| 1. The employees of the XYZ Bank greet me when it's my turn to be served. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The employees of the XYZ Bank give personal attention to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank has employees who deal with customers in a caring manner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The XYZ Bank employees understand my specific needs. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The behaviour of employees in the XYZ Bank instils confidence in me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The XYZ Bank employees do not hesitate to find the time to serve me better. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Statement | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| **Expertise** | | | | | | | |
| 1. The employees of the XYZ Bank have adequate knowledge about the bank's services and products. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The employees of the XYZ Bank are knowledgeable when answering my questions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank employees have the necessary knowledge to serve me promptly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The employees of the XYZ Bank give clear and precise answers to my enquiries. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The XYZ bank has competent employees who demonstrate the necessary banking skills. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The employees of the XYZ Bank are efficient in handling my transactions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Problem Solving** | | | | | | | |
| 1. The employees of the XYZ Bank have the ability to solve a problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The employees of the XYZ Bank have shown an interest in solving problems. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The employees of the XYZ Bank are dependable in handling customer service problems. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The employees of the XYZ Bank have the ability to openly discuss solutions when problems arise. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I do not have to visit the XYZ Bank many times to solve a particular problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Information** | | | | | | | |
| 1. The employees of the XYZ Bank keep me informed about matters of concern to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The employees of the XYZ Bank keep the client informed every time a better solution appears to a problem. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The employees of the XYZ Bank always provide clear information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The employees of the XYZ Bank always provide accurate information. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The employees of the XYZ Bank explain their services and fees fully to the customer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The XYZ Bank provides information when there is a new banking service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The employees of the XYZ Bank continuously provide me with progress information when I apply for a service that needs time to be completed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Statement | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| **Overall** | | | | | | | |
| 1. The employees of the XYZ Bank deliver a superior service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The employees of the XYZ Bank consistently provide quality services. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The level at which the employees of the XYZ Bank understand my needs is very good. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Overall, I'd say the quality of my interaction with the XYZ Bank's employees is excellent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **SECTION B: Physical Environment Quality** | | | | | | | |
| **Ambient Conditions** | | | | | | | |
| 1. Space in the XYZ Bank is adequate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank looks attractive from the outside. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The temperature in the XYZ Bank is comfortable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The noise level in the XYZ Bank is reasonable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I believe that the XYZ Bank provides a comfortable environment in which to do business. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Equipment** | | | | | | | |
| 1. The XYZ Bank has modern looking equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank has up to date equipment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank employs the latest technology in banking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The XYZ Bank's ATM machine is easily accessible. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The XYZ Bank's ATM machine is easy to operate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The XYZ Bank's ATM machine is always working. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Physical Appeal** | | | | | | | |
| 1. The XYZ Bank's physical facilities are attractive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank's physical facilities are comfortable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank has a superb layout and furniture arrangement. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The XYZ Bank's interior design (furnishing) gives me the appearance of a quality branch. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Material associated with the service (such as pamphlets or statements) are visually appealing at the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The employees of the XYZ Bank are well dressed and neat in appearance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Statement | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| **Social Factors** | | | | | | | |
| 1. The attitudes of other customers do not disturb me in the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The behaviour of other customers does not disturb me in the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am not disturbed when other customers interact with the employees in the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The presence of other customers of the XYZ Bank does not affect its ability to provide me with good service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Overall** | | | | | | | |
| 1. I feel comfortable in the physical environment of the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I would rate the XYZ Bank's physical environment highly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I think that XYZ Bank's physical environment is one of the best in the industry. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Overall, the physical environment of the XYZ Bank is excellent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **SECTION C: Outcome Quality** | | | | | | | |
| **Waiting Time** | | | | | | | |
| 1. I find queues in the XYZ Bank move rapidly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I do not have to wait long to be served in the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am able to conduct a transaction immediately or after a short waiting period in the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. There are no long queues in front of ATM machines at the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The XYZ Bank provides the service at the time the service was promised. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Convenience** | | | | | | | |
| 1. The XYZ Bank offers sufficient and convenient operating hours. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I find the XYZ Bank has convenient branch locations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. It is easy to find the XYZ Bank ATMs in places other than its branches. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I find a variety of transactions can be performed at the XYZ Bank ATMs. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I find clear guidance and information on signs on how to use the XYZ Banks' services and facilities. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The XYZ Bank offers alternative channels for transactions (e.g. e-banking, Internet banking, and phone-banking). | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Statement | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| **Valence**<br>*These questions refer to whether you think the outcome of your experience was good or bad, regardless of your evaluation of any other aspect of the experience. Please choose the number which best reflects your perception of whether your experience was good or bad.* | | | | | | | |
| 1. When I leave the XYZ Bank, I usually feel I have had a good experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I believe the XYZ Bank tries to give me a good experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I believe the XYZ Bank knows the type of experience its customers want. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Security and Privacy** | | | | | | | |
| 1. I feel safe at the XYZ Banks' ATM site. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I feel safe inside the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The employees of the XYZ Bank respect the privacy of my financial affairs when I am standing at the counter. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I feel secure in my dealings with the employees of the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I find all transactions in the XYZ Bank are confidential. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I believe the XYZ Bank is a bank that is worth trusting. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The XYZ Bank offers privacy in problem solving situations. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Reliability** | | | | | | | |
| 1. I find an absence of errors in the service delivered by the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank performs the service right the first time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank performs the service accurately. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. When the XYZ Bank promises to do something by a certain time it does so. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The XYZ Bank guarantees a reliable service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The XYZ Bank employees are always available for service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Speed of Decisions and Response** | | | | | | | |
| 1. The XYZ Bank responds efficiently to customer feedback. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank is responsive to my requests. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank offers a fast and efficient service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The employees of the XYZ Bank give a prompt service. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The employees of the XYZ Bank are efficient in handling complaints. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Statement | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| **Overall** | | | | | | | |
| 1. It is always a good experience to use the services of the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I feel good about what the XYZ Bank provides to its customers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Overall, I achieve the desired outcome when using the services of the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **SECTION D: Service Quality, Customer Satisfaction, Perceived Value, Corporate Image, Switching Costs and Behavioural Intentions** | | | | | | | |
| **Service Quality** | | | | | | | |
| 1. I believe that the XYZ Bank provides superior services in every way. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The quality of the service provided at the XYZ Bank is of a high standard. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The quality of the service provided at the XYZ Bank is impressive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The XYZ Bank consistently provides high quality products. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Overall, the service quality of the XYZ Bank is excellent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Customer Satisfaction** | | | | | | | |
| 1. My choice to be a customer of the XYZ Bank is a wise one. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I believe that purchasing services from the XYZ Bank is usually a satisfying experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I am pleased with what the XYZ Bank does for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I feel delighted with the services and products delivered by the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Overall, the XYZ Bank provides a very satisfying experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Perceived Value** | | | | | | | |
| 1. The XYZ Bank offers the best loan interest rates. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank offers the best deposit interest rates. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank charges a reasonable service fees and commissions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The services I receive from the XYZ Bank provide value for money. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Overall, I feel the XYZ Bank services and products are valuable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Statement | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| **Corporate Image** | | | | | | | |
| 1. The XYZ Bank has a good reputation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The XYZ Bank has a better image than its competitors. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The XYZ Bank contributes to society. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. In my opinion, the XYZ Bank has a good image in the minds of consumers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Overall, I have a good impression of the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Switching Costs** | | | | | | | |
| 1. To change to another bank involves investing time in searching for information about other banks. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. To change to another bank involves much effort in deciding which other bank to use. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. To change to another bank involves a risk as another bank might not satisfy me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I will have difficulties familiarising myself with the procedures of a new bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I think that changing from one bank to another is too much of a bother. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. Overall, it is not worthwhile to switch to a new retail bank provider. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **Behavioural Intentions** | | | | | | | |
| 1. I will say positive things about the XYZ Bank to other people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I would always recommend the XYZ Bank to someone who seeks my advice on banking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I would encourage friends and acquaintances to do business with the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I would consider the XYZ Bank as my primary bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I intend to continue doing business with the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I intend to do more business with the XYZ Bank in the next few years. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Overall, given the other choices of retail banking service providers, I will remain as a customer of the XYZ Bank. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**SECTION E: Demographic Information**

The questions below relate to personal data. Please **TICK (✓)** one box which is best applicable to you.

What is your gender? ☐ Male ☐ Female

What is your age group? ☐ 18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56-65 ☐ 66 and above

What is your occupation? ☐ Sales ☐ Business Owner ☐ Student ☐ Executive ☐ Manager ☐ Professional ☐ Other (please specify)_____

What is your monthly income? ☐ Less than RM2,000 ☐ RM2,000-RM3,999 ☐ RM4,000-RM5,999 ☐ RM6,000-RM7,999 ☐ RM8,000-RM9,999 ☐ Over RM10,000

How long have you been a customer of XYZ Bank? _____ years and _____months

***Thank you very much for your time. Wishing you a very good day.***

## Appendix 2: Items References

### Questionnaire Items to Measure Interaction Quality

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Attitude (5 items) | Aatt1 | The employees of the XYZ Bank are friendly. | Al-Hawari & Ward, 2006; Yavas et al., 2004; Bahia & Nantel, 2000 |
| | Aatt2 | The employees of the XYZ Bank are patient. | |
| | Aatt3 | The employees of the XYZ Bank are willing to help me. | |
| | Aatt4 | The employees of the XYZ Bank are consistently courteous. | |
| | Aatt5 | The employees of the XYZ Bank have a positive attitude towards customer service. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Behaviour (6 items) | Abehav1 | The employees of the XYZ Bank greet me when it's my turn to be served. | Al-Hawari & Ward, 2006; Ehigie, 2006; Yavas et al., 2004; Bahia & Nantel, 2000 |
| | Abehav2 | The employees of the XYZ Bank give personal attention to me. | |
| | Abehav3 | The XYZ Bank has employees who deal with customers in a caring manner. | |
| | Abehav4 | The XYZ Bank employees understand my specific needs. | |
| | Abehav5 | The behaviour of employees in the XYZ Bank instils confidence in me. | |
| | Abehav6 | The XYZ Bank employees do not hesitate to find the time to serve me better. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Information (7 items) | Ainfo1 | The employees of the XYZ Bank keep me informed about matters of concern to me. | Lu et al., 2009; Martinez Caro & Martinez García, 2007; Jabnoun & Al-Tamimi, 2003; Blanchard & Galloway, 1994 |
| | Ainfo2 | The employees of the XYZ Bank keep the client informed every time a better solution appears to a problem. | |
| | Ainfo3 | The employees of the XYZ Bank always provide clear information. | |
| | Ainfo4 | The employees of the XYZ Bank always provide accurate information. | |
| | Ainfo5 | The employees of the XYZ Bank explain their services and fees fully to the customer. | |
| | Ainfo6 | The XYZ Bank provides information when there is a new banking service. | |
| | Ainfo7 | The employees of the XYZ Bank continuously provide me with progress information when I apply for a service that needs time to be completed. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Expertise (6 items) | Aexpert1 | The employees of the XYZ Bank have adequate knowledge about the bank's services and products. | Caro & García, 2008; 2007; Clemes et al., 2007; Arasli et al., 2005a; Brady & Cronin, 2001 |
| | Aexpert2 | The employees of the XYZ Bank are knowledgeable when answering my questions. | |
| | Aexpert3 | The XYZ Bank employees have the necessary knowledge to serve me promptly. | |
| | Aexpert4 | The employees of the XYZ Bank give clear and precise answers to my enquiries. | |
| | Aexpert5 | The XYZ bank has competent employees who demonstrate the necessary banking skills. | |
| | Aexpert6 | The employees of the XYZ Bank are efficient in handling my transactions. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Problem Solving (5 items) | Aprobl1 | The employees of the XYZ Bank have the ability to solve a problem. | Clemes et al., 2010; de Matos et al., 2009; Lu et al., 2009; Caro & García, 2008; 2007; Ladhari, Souiden & Ladhari, 2011b |
| | Aprobl2 | The employees of the XYZ Bank have shown an interest in solving problems. | |
| | Aprobl3 | The employees of the XYZ Bank are dependable in handling customer service problems. | |
| | Aprobl4 | The employees of the XYZ Bank have the ability to openly discuss solutions when problems arise. | |
| | Aprobl5 | I do not have to visit the XYZ Bank many times to solve a particular problem. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Interaction Quality (4 Items) | Aall1 | The employees of the XYZ Bank deliver a superior service. | Brady & Cronin, 2001; Veloutsou et al., 2004; Pollack, 2009 |
| | Aall2 | The employees of the XYZ Bank consistently provide quality services. | |
| | Aall3 | The level at which the employees of the XYZ Bank understand my needs is very good. | |
| | Aall4 | Overall, I'd say the quality of my interaction with the XYZ Bank's employees is excellent. | |

## Questionnaire Items to Measure Physical Environment Quality

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Ambient Conditions (5 Items) | Bambient1 | Space in the XYZ Bank is adequate. | de Matos et al., 2009; Caro & García, 2008; Al-Hawari & Ward, 2006; Ko & Pastore, 2005; Brady & Cronin, |
| | Bambient2 | The XYZ Bank looks attractive from the outside. | |
| | Bambient3 | The temperature in the XYZ Bank is comfortable. | |
| | Bambient4 | The noise level in the XYZ Bank is reasonable. | |

| | | | |
|---|---|---|---|
| | Bambient5 | I believe that the XYZ Bank provides a comfortable environment in which to do business. | 2001; Bahia & Nantel, 2000 |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Equipment (6 items) | Bequip1 | The XYZ Bank has modern looking equipment. | de Matos et al., 2009; Lu et al., 2009; Caro & García, 2008; Al-Hawari & Ward, 2006; Ko & Pastore, 2005 |
| | Bequip2 | The XYZ Bank has up to date equipment. | |
| | Bequip3 | The XYZ Bank employs the latest technology in banking. | |
| | Bequip4 | The XYZ Bank's ATM machine is easily accessible. | |
| | Bequip5 | The XYZ Bank's ATM machine is easy to operate. | |
| | Bequip6 | The XYZ Bank's ATM machine is always working. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Physical Appeal (6 items) | Bphys1 | The XYZ Bank's physical facilities are attractive. | Lu et al., 2009; Manrai & Manrai, 2007; Ko &Pastore, 2005; Yavas et al., 2004; Brady & Cronin, 2001; Oppewal & Vriens, 2000; Arasli et al., 2005b; Levesque & McDougall, 1996 |
| | Bphys2 | The XYZ Bank's physical facilities are comfortable. | |
| | Bphys3 | The XYZ Bank has a superb layout and furniture arrangement. | |
| | Bphys4 | The XYZ Bank's interior design (furnishing) gives me the appearance of a quality branch. | |
| | Bphys5 | Material associated with the service (such as pamphlets or statements) are visually appealing at the XYZ Bank. | |
| | Bphys6 | The employees of the XYZ Bank are well dressed and neat in appearance. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Quality of the Physical Environment (4 Items) | Ball1 | I feel comfortable in the physical environment of the XYZ Bank. | Brady & Cronin, 2001 |
| | Ball2 | I would rate the XYZ Bank's physical environment highly. | |
| | Ball3 | I think that XYZ Bank's physical environment is one of the best in the industry. | |
| | Ball4 | Overall, the physical environment of the XYZ Bank is excellent. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Social Factors (4 Items) | Bsocial1 | The attitudes of other customers do not disturb me in the XYZ Bank. | Brady & Cronin (2001) |
| | Bsocial2 | The behaviour of other customers does not disturb me in the XYZ Bank. | |
| | Bsocial3 | I am not disturbed when other customers interact with the employees in the XYZ Bank. | |
| | Bsocial4 | The presence of other customers of the XYZ Bank does not affect its ability to provide me with good service. | |

## Questionnaire Items to Measure Outcome Quality

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Waiting Time (5 Items) | Cwait1 | I find queues in the XYZ Bank move rapidly. | Pollack, 2009; Caro & García, 2008; Beerli et al., 2004; Brady & Cronin, 2001; Bahia & Nantel, 2000 |
| | Cwait2 | I do not have to wait long to be served in the XYZ Bank. | |
| | Cwait3 | I am able to conduct a transaction immediately or after a short waiting period in the XYZ Bank. | |
| | Cwait4 | There are no long queues in front of ATM machines at the XYZ Bank. | |
| | Cwait5 | The XYZ Bank provides the service at the time the service was promised. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Convenience (6 Items) | Cconvenience1 | The XYZ Bank offers sufficient and convenient operating hours. | Yavas et al., 2004 |
| | Cconvenience2 | I find the XYZ Bank has convenient branch locations. | |
| | Cconvenience3 | It is easy to find the XYZ Bank ATMs in places other than its branches. | |
| | Cconvenience4 | I find a variety of transactions can be performed at the XYZ Bank ATMs. | |
| | Cconvenience5 | I find clear guidance and information on signs on how to use the XYZ Banks' services and facilities. | |
| | Cconvenience6 | The XYZ Bank offers alternative channels for transactions (e.g. e-banking, Internet banking, and phone-banking). | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Valence (3 Items) | Cvalence1 | When I leave the XYZ Bank, I usually feel I have had a good experience. | Lu et al., 2009; Caro & García, 2008; 2007; Brady & Cronin, 2001 |
| | Cvalence2 | I believe the XYZ Bank tries to give me a good experience. | |
| | Cvalence3 | I believe the XYZ Bank knows the type of experience its customers want. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Security and Privacy (7 Items) | Csecure1 | I feel safe at the XYZ Banks' ATM site. | Lassar et al., 2000; Ennew, Reed, & Binks, 1993; Blanchard & Galloway, 1994 |
| | Csecure2 | I feel safe inside the XYZ Bank. | |
| | Csecure3 | The employees of the XYZ Bank respect the privacy of my financial affairs when I am standing at the counter. | |
| | Csecure4 | I feel secure in my dealings with the employees of the XYZ Bank. | |
| | Csecure5 | I find all transactions in the XYZ Bank are confidential. | |
| | Csecure6 | I believe the XYZ Bank is a bank that is worth trusting. | |
| | Csecure7 | The XYZ Bank offers privacy in problem solving situations. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Reliability (6 Items) | Creliable1 | I find an absence of errors in the service delivered by the XYZ Bank. | Rod et al., 2009; Shamdasani, Mukherjee, & Malhotra, 2008; Arasli et al., 2005b; Bahia & Nantel, 2000 |
| | Creliable2 | The XYZ Bank performs the service right the first time. | |
| | Creliable3 | The XYZ Bank performs the service accurately. | |
| | Creliable4 | When the XYZ Bank promises to do something by a certain time it does so. | |
| | Creliable5 | The XYZ Bank guarantees a reliable service. | |
| | Creliable6 | The XYZ Bank employees are always available for service. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Speed of Decisions and Response (5 Items) | Cspeed1 | The XYZ Bank responds efficiently to customer feedback. | Shamdasani et al., 2008; Ennew et al., 1993; Jamal & Anastasiadou, 2009 |
| | Cspeed2 | The XYZ Bank is responsive to my requests. | |
| | Cspeed3 | The XYZ Bank offers a fast and efficient service. | |
| | Cspeed4 | The employees of the XYZ Bank give a prompt service. | |
| | Cspeed5 | The employees of the XYZ Bank are efficient in handling complaints. | |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Outcome Quality (3 Items) | Call1 | It is always a good experience to use the services of the XYZ Bank. | Brady & Cronin, 2001 |
| | Call2 | I feel good about what the XYZ Bank provides to its customers. | |
| | Call3 | Overall, I achieve the desired outcome when using the services of the XYZ Bank. | |

## Questionnaire Items to Measure Six Higher-Order Constructs

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Service Quality (5 Items) | Dsq1 | I believe that the XYZ Bank provides superior services in every way. | Dagger et al., 2007 |
| | Dsq2 | The quality of the service provided at the XYZ Bank is of a high standard. | Dagger et al., 2007 |
| | Dsq3 | The quality of the service provided at the XYZ Bank is impressive. | Dagger et al., 2007 |
| | Dsq4 | The XYZ Bank consistently provides high quality products. | Clemes at al., 2014 |
| | Dsq5 | Overall, the service quality of the XYZ Bank is excellent. | Dagger et al., 2007 |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Customer Satisfaction (5 Items) | Dcs1 | My choice to be a customer of the XYZ Bank is a wise one. | Cronin et al. 2000 |
| | Dcs2 | I believe that purchasing services from the XYZ Bank is usually a satisfying experience. | Caruana, Money, & Berthon, 2000 |
| | Dcs3 | I am pleased with what the XYZ Bank does for me. | Ndubisi, 2006 |
| | Dcs4 | I feel delighted with the services and products delivered by the XYZ Bank. | Collier and Bienstock, 2006; Ndubisi and Wah, 2005; Voss et al., 1998 |

| | | | |
|---|---|---|---|
| | Dcs5 | Overall, the XYZ Bank provides a very satisfying experience. | Baumann et. al., 2005 Ganesh et al., 2000; Krepapa et al., 2003; Woo and Fock, 1999 |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Perceived Value (5 Items) | Dpv1 | The XYZ Bank offers the best loan interest rates. | Lewis & Soureli, 2006 |
| | Dpv2 | The XYZ Bank offers the best deposit interest rates. | Lewis & Soureli, 2006 |
| | Dpv3 | The XYZ Bank charges a reasonable service fees and commissions. | Sweeney & Soutar, 2001 |
| | Dpv4 | The services I receive from the XYZ Bank provide value for money. | Sweeney & Soutar, 2001 |
| | Dpv5 | Overall, I feel the XYZ Bank services and products are valuable. | Clemes at al., 2014 |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Corporate Image (5 Items) | Dci1 | The XYZ Bank has a good reputation. | Lewis & Soureli, 2006 |
| | Dci2 | The XYZ Bank has a better image than its competitors. | Nguyen and LeBlanc, 2001; Lewis & Soureli, 2006 |
| | Dci3 | The XYZ Bank contributes to society. | Lewis & Soureli, 2006 |
| | Dci4 | In my opinion, the XYZ Bank has a good image in the minds of consumers. | Nguyen and LeBlanc, 2001 |
| | Dci5 | Overall, I have a good impression of the XYZ Bank. | Nguyen and LeBlanc, 2001;Veloutsou et al., 2004 |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Switching Costs (6 Items) | Dswitch1 | To change to another bank involves investing time in searching for information about other banks. | Beerli et al., 2004 |
| | Dswitch2 | To change to another bank involves much effort in deciding which other bank to use. | Beerli et al., 2004 |
| | Dswitch3 | To change to another bank involves a risk as another bank might not satisfy me. | Beerli et al., 2004; Aydin et al., 2005 |
| | Dswitch4 | I will have difficulties familiarising myself with the procedures of a new bank. | Lewis & Soureli, (2006) |
| | Dswitch5 | I think that changing from one bank to another is too much of a bother. | Lewis & Soureli, (2006) |
| | Dswitch6 | Overall, it is not worthwhile to switch to a new retail bank provider. | Clemes et al., 2014 |

| | Item Number | Description/Scale Item | Source |
|---|---|---|---|
| Behaviour Intentions (7 Items) | Dbehav1 | I will say positive things about the XYZ Bank to other people. | Caruana, 2002; Zeithaml et al., 1996 |
| | Dbehav2 | I would always recommend the XYZ Bank to someone who seeks my advice on banking. | Aydin & Ozer, 2005; Beerli et al., 2004; Dabholkar et al., 1996; 2000; Ganesh et al., 2000; Johnson et al., 2001; Reichheld, 2003; Zeithaml et al.,1996 |
| | Dbehav3 | I would encourage friends and acquaintances to do business with the XYZ Bank. | Athanassopoulos et al., 2001; Zeithaml et al. 1996 |
| | Dbehav4 | I would consider the XYZ Bank as my primary bank. | Caruana, 2002; Johnson & Grayson, 2003; Zeithaml et al., 1996 |
| | Dbehav5 | I intend to continue doing business with the XYZ Bank. | Caruana, 2002; Yang & Peterson, 2004; Zeithaml et al., 1996 |
| | Dbehav6 | I intend to do more business with the XYZ Bank in the next few years. | Caruana, 2002; Ganesh et al., 2000; Johnson et al., 2001; Lewis & Soureli, 2006; Van Riel et al., 2001; Zeithaml et al., 1996 |
| | Dbehav7 | Overall, given the other choices of retail banking service providers, I will remain as a customer of the XYZ Bank. | Clemes at al., 2014 |

**Appendix 3: Guideline for Identifying Significant Factor Loadings Based on Sample Size**

| Factor Loading | Sample Size Needed for Significance |
|---|---|
| 0.30 | 350 |
| 0.35 | 250 |
| 0.40 | 200 |
| 0.45 | 150 |
| 0.50 | 120 |
| 0.55 | 100 |
| 0.60 | 85 |
| 0.65 | 70 |
| 0.70 | 60 |
| 0.75 | 50 |

*Source:* Hair et al. (2010, p. 309).

**Appendix 4: Equation for Average Variance Extracted(AVE) and Construct Reliability (CR)**

$$Average\ Variance\ Extracted = \frac{\sum(standardized\ loadings)^2}{\sum(standardized\ loadings)^2 + \sum measurement\ errors}$$

*Source:* Janssens et al. (2008, p. 309).

$$Composite\ Reliability = \frac{(\sum standardized\ loadings)^2}{(\sum standardized\ loadings)^2 + \sum measurement\ errors}$$

*Source:* Janssens et al. (2008, p. 307).

## Appendix 5 : Normality Test (Skewness and Kurtosis; *N* = 491)

| Item | Skewness | Kurtosis | Item | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Aatt1 | -.365 | .027 | Bam4 | -.123 | -.406 |
| Aatt2 | -.214 | .185 | Bam5 | .088 | -.693 |
| Aatt3 | -.197 | -.343 | Beq1 | -.428 | .138 |
| Aatt4 | -.221 | .030 | Beq2 | -.563 | .575 |
| Aatt5 | -.270 | .235 | Beq3 | -.306 | -.243 |
| Abe1 | -.135 | -.122 | Beq4 | -.185 | -.512 |
| Abe2 | -.146 | -.171 | Beq5 | -.309 | -.098 |
| Abe3 | -.243 | .197 | Beq6 | -.192 | -.400 |
| Abe4 | -.257 | .043 | Bphy1 | -.323 | -.413 |
| Abe5 | -.040 | -.408 | Bphy2 | -.631 | .573 |
| Abe6 | -.207 | .131 | Bphy3 | -.563 | .650 |
| Aex1 | -.222 | .019 | Bphy4 | -.200 | -.234 |
| Aex2 | -.066 | -.018 | Bphy5 | -.123 | -.545 |
| Aex3 | -.051 | .022 | Bphy6 | -.196 | -.308 |
| Aex4 | -.265 | .023 | Bsoc1 | .121 | -.615 |
| Aex5 | -.264 | .337 | Bsoc2 | .009 | -.556 |
| Aex6 | -.094 | .016 | Bsoc3 | -.165 | -.040 |
| Aprb1 | -.088 | -.124 | Bsoc4 | -.028 | -.316 |
| Aprbl2 | -.209 | -.051 | Ball1 | -.204 | -.042 |
| Aprb3 | -.259 | .074 | Ball2 | -.470 | .603 |
| Aprb4 | -.247 | .634 | Ball3 | -.193 | .194 |
| Aprb5 | -.327 | .435 | Ball4 | -.164 | .102 |
| Ainfo1 | -.224 | .222 | Cwa1 | -.183 | -.514 |
| Ainfo2 | -.247 | -.031 | Cwa2 | -.323 | -.133 |
| Ainfo3 | -.291 | .495 | Cwa3 | -.208 | -.318 |
| Ainfo4 | -.081 | -.093 | Cwa4 | -.162 | -.085 |
| Ainfo5 | -.262 | .075 | Cwa5 | -.212 | .088 |
| Ainfo6 | -.283 | .390 | Cco1 | -.520 | .628 |
| Ainfo7 | -.351 | .478 | Cco2 | -.191 | -.117 |
| Aall1 | -.113 | -.124 | Cco3 | -.296 | -.145 |
| Aall2 | -.343 | .130 | Cco4 | -.234 | -.117 |
| Aall3 | -.017 | .266 | Cco5 | -.115 | -.097 |
| Aall4 | -.319 | .596 | Cco6 | -.200 | -.685 |
| Bam1 | -.189 | -.591 | Cval1 | .009 | -.573 |
| Bam2 | -.353 | -.045 | Cval2 | -.089 | -.270 |
| Bam3 | -.431 | -.017 | Cval3 | -.020 | -.162 |
| Csec3 | -.343 | .201 | Dci4 | -.270 | -.077 |
| Csec4 | .057 | -.120 | Dci5 | -.181 | -.488 |
| Csec5 | -.141 | .124 | Csec1 | -.248 | -.011 |
| **Item** | **Skewness** | **Kurtosis** | **Item** | **Skewness** | **Kurtosis** |

| | | | | | |
|---|---|---|---|---|---|
| Csec6 | -.059 | -.219 | Csec2 | -.621 | .681 |
| Csec7 | .117 | -.360 | Dsc1 | -.460 | .735 |
| Crel1 | -.067 | -.297 | Dsc2 | -.406 | .558 |
| Crel2 | .223 | -.332 | Dsc3 | -.327 | .513 |
| Crel3 | .044 | .039 | Dsc4 | -.406 | .422 |
| Crel4 | .028 | .120 | Dsc5 | -.467 | .634 |
| Crel5 | -.082 | -.321 | Dsc6 | -.578 | 1.070 |
| Crel6 | -.042 | .218 | Dbi1 | -.017 | -.399 |
| Csp1 | -.279 | .037 | Dbi2 | .051 | -.400 |
| Csp2 | -.204 | -.017 | Dbi3 | .057 | -.557 |
| Csp3 | -.300 | -.023 | Dbi4 | -.323 | .582 |
| Csp4 | -.021 | -.227 | Dbi5 | -.046 | -.125 |
| Csp5 | -.328 | .490 | Dbi6 | -.356 | .770 |
| Call1 | -.266 | .019 | Dbi7 | -.196 | .305 |
| Call2 | .035 | -.322 | | | |
| Call3 | .142 | -.184 | | | |
| Dsq1 | -.125 | -.361 | | | |
| Dsq2 | -.129 | -.233 | | | |
| Dsq3 | .174 | -.401 | | | |
| Dsq4 | .029 | -.592 | | | |
| Dsq5 | -.112 | -.186 | | | |
| Dcs1 | -.148 | -.328 | | | |
| Dcs2 | -.189 | -.120 | | | |
| Dcs3 | -.179 | -.005 | | | |
| Dcs4 | -.080 | -.171 | | | |
| Dcs5 | -.326 | .160 | | | |
| Dpv1 | -.192 | -.160 | | | |
| Dpv2 | -.264 | -.115 | | | |
| Dpv3 | -.105 | -.037 | | | |
| Dpv4 | .086 | .263 | | | |
| Dpv5 | .163 | .157 | | | |
| Dci1 | -.326 | -.432 | | | |
| Dci2 | -.282 | -.175 | | | |
| Dci3 | -.154 | -.561 | | | |

## Appendix 6: Multivariate Normality and Kurtosis

***N* = 491**

| Variable | min | max | skew | c.r. | kurtosis | c.r. |
|---|---|---|---|---|---|---|
| Dbehav1 | 2.000 | 7.000 | -.017 | -.155 | -.407 | -1.843 |
| Dbehav2 | 2.000 | 7.000 | .050 | .456 | -.408 | -1.845 |
| Dbehav3 | 3.000 | 7.000 | .057 | .518 | -.563 | -2.548 |
| Dbehav4 | 1.000 | 7.000 | -.322 | -2.914 | .564 | 2.552 |
| Dbehav5 | 2.000 | 7.000 | -.045 | -.410 | -.136 | -.616 |
| Dbehav6 | 1.000 | 7.000 | -.355 | -3.214 | .750 | 3.392 |
| Dbehav7 | 1.000 | 7.000 | -.196 | -1.771 | .290 | 1.311 |
| Dswitch1 | 1.000 | 7.000 | -.458 | -4.145 | .715 | 3.234 |
| Dswitch2 | 1.000 | 7.000 | -.405 | -3.661 | .540 | 2.444 |
| Dswitch3 | 1.000 | 7.000 | -.326 | -2.946 | .496 | 2.243 |
| Dswitch4 | 1.000 | 7.000 | -.405 | -3.662 | .406 | 1.835 |
| Dswitch5 | 1.000 | 7.000 | -.465 | -4.208 | .616 | 2.785 |
| Dswitch6 | 1.000 | 7.000 | -.577 | -5.215 | 1.047 | 4.736 |
| Dci1 | 2.000 | 7.000 | -.325 | -2.940 | -.440 | -1.988 |
| Dci2 | 2.000 | 7.000 | -.281 | -2.542 | -.186 | -.840 |
| Dci3 | 2.000 | 7.000 | -.153 | -1.385 | -.567 | -2.565 |
| Dci4 | 2.000 | 7.000 | -.269 | -2.436 | -.088 | -.400 |
| Dci5 | 2.000 | 7.000 | -.181 | -1.635 | -.495 | -2.241 |
| Dpv1 | 1.000 | 7.000 | -.191 | -1.728 | -.170 | -.771 |
| Dpv2 | 1.000 | 7.000 | -.263 | -2.380 | -.126 | -.570 |
| Dpv3 | 1.000 | 7.000 | -.104 | -.943 | -.049 | -.221 |
| Dpv4 | 1.000 | 7.000 | .085 | .771 | .248 | 1.120 |
| Dpv5 | 2.000 | 7.000 | .163 | 1.470 | .143 | .649 |
| Dcs1 | 2.000 | 7.000 | -.147 | -1.331 | -.337 | -1.523 |
| Dcs2 | 2.000 | 7.000 | -.188 | -1.700 | -.131 | -.593 |
| Dcs3 | 2.000 | 7.000 | -.179 | -1.617 | -.017 | -.077 |
| Dcs4 | 2.000 | 7.000 | -.080 | -.721 | -.181 | -.819 |
| Dcs5 | 2.000 | 7.000 | -.325 | -2.944 | .146 | .660 |
| Dsq1 | 2.000 | 7.000 | -.125 | -1.131 | -.370 | -1.673 |
| Dsq2 | 2.000 | 7.000 | -.128 | -1.160 | -.243 | -1.098 |
| Dsq3 | 3.000 | 7.000 | .174 | 1.573 | -.410 | -1.852 |
| Dsq4 | 2.000 | 7.000 | .029 | .262 | -.598 | -2.706 |
| Dsq5 | 1.000 | 7.000 | -.112 | -1.011 | -.196 | -.887 |
| **Multivariate** | | | | | **198.896** | **45.849** |

***N* = 251**

| Variable | min | max | skew | c.r. | kurtosis | c.r. |
|---|---|---|---|---|---|---|
| Dbehav1 | 2.000 | 7.000 | -.073 | -.473 | -.362 | -1.171 |
| Dbehav2 | 3.000 | 7.000 | .137 | .886 | -.547 | -1.770 |
| Dbehav3 | 3.000 | 7.000 | -.051 | -.329 | -.646 | -2.091 |
| Dbehav4 | 2.000 | 7.000 | .042 | .270 | -.300 | -.969 |
| Dbehav5 | 2.000 | 7.000 | .016 | .102 | -.259 | -.837 |
| Dbehav6 | 2.000 | 7.000 | -.191 | -1.235 | .157 | .509 |
| Dbehav7 | 2.000 | 7.000 | -.040 | -.256 | -.376 | -1.216 |
| Dswitch1 | 2.000 | 7.000 | -.191 | -1.235 | .440 | 1.424 |
| Dswitch2 | 2.000 | 7.000 | -.082 | -.531 | -.148 | -.480 |
| Dswitch3 | 2.000 | 7.000 | -.203 | -1.312 | .029 | .094 |
| Dswitch4 | 2.000 | 7.000 | -.039 | -.254 | -.327 | -1.057 |
| Dswitch5 | 3.000 | 7.000 | .064 | .412 | -.334 | -1.081 |
| Dswitch6 | 3.000 | 7.000 | .250 | 1.618 | -.353 | -1.142 |
| Dci1 | 2.000 | 7.000 | -.438 | -2.831 | -.132 | -.426 |
| Dci2 | 2.000 | 7.000 | -.263 | -1.700 | .011 | .035 |
| Dci3 | 2.000 | 7.000 | -.324 | -2.099 | -.222 | -.718 |
| Dci4 | 2.000 | 7.000 | -.379 | -2.450 | .285 | .922 |
| Dci5 | 3.000 | 7.000 | -.111 | -.715 | -.693 | -2.240 |
| Dpv1 | 1.000 | 7.000 | -.139 | -.896 | -.195 | -.629 |
| Dpv2 | 1.000 | 7.000 | -.162 | -1.050 | -.445 | -1.439 |
| Dpv3 | 1.000 | 7.000 | -.030 | -.197 | -.330 | -1.068 |
| Dpv4 | 1.000 | 7.000 | .065 | .420 | -.125 | -.405 |
| Dpv5 | 2.000 | 7.000 | .171 | 1.106 | -.276 | -.893 |
| Dcs1 | 3.000 | 7.000 | -.182 | -1.176 | -.665 | -2.150 |
| Dcs2 | 3.000 | 7.000 | -.182 | -1.177 | -.554 | -1.790 |
| Dcs3 | 2.000 | 7.000 | -.092 | -.594 | -.441 | -1.426 |
| Dcs4 | 2.000 | 7.000 | .039 | .253 | -.357 | -1.153 |
| Dcs5 | 3.000 | 7.000 | -.279 | -1.802 | -.323 | -1.044 |
| Dsq1 | 3.000 | 7.000 | -.073 | -.470 | -.506 | -1.636 |
| Dsq2 | 3.000 | 7.000 | -.092 | -.595 | -.432 | -1.398 |
| Dsq3 | 3.000 | 7.000 | -.066 | -.426 | -.381 | -1.231 |
| Dsq4 | 3.000 | 7.000 | .009 | .059 | -.604 | -1.954 |
| Dsq5 | 3.000 | 7.000 | -.065 | -.417 | -.471 | -1.523 |
| **Multivariate** | | | | | **56.530** | **9.317** |

## Appendix 7: Correlation Matrix (Interaction Quality)

| Correlation | Aatt1 | Aatt2 | Aatt3 | Aatt4 | Aatt5 | Abe1 | Abe2 | Abe3 | Abe4 | Abe5 | Abe6 | Aex1 | Aex2 | Aex3 | Aex4 | Aex5 | Aex6 | Apb1 | Aprb2 | Aprb3 | Aprb4 | Aprbl5 | Ainfo1 | Ainfo2 | Ainfo3 | Ainfo4 | Ainfo5 | Ainfo6 | Ainfo7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aatt1 | 1.000 | .690 | .708 | .624 | .672 | .521 | .493 | .494 | .377 | .488 | .479 | .461 | .386 | .417 | .395 | .341 | .407 | .295 | .294 | .339 | .288 | .356 | .327 | .331 | .416 | .398 | .411 | .404 | .445 |
| Aatt2 | .690 | 1.000 | .660 | .724 | .669 | .472 | .530 | .513 | .459 | .536 | .572 | .402 | .379 | .425 | .393 | .458 | .375 | .382 | .425 | .440 | .398 | .381 | .350 | .356 | .405 | .419 | .377 | .408 | .418 |
| Aatt3 | .708 | .660 | 1.000 | .696 | .707 | .500 | .516 | .525 | .450 | .555 | .524 | .547 | .457 | .493 | .432 | .409 | .398 | .424 | .345 | .335 | .356 | .326 | .370 | .322 | .427 | .347 | .371 | .319 | .362 |
| Aatt4 | .624 | .724 | .696 | 1.000 | .741 | .456 | .564 | .562 | .466 | .495 | .525 | .360 | .368 | .410 | .382 | .394 | .408 | .306 | .414 | .367 | .396 | .304 | .384 | .406 | .464 | .390 | .428 | .437 | .508 |
| Aatt5 | .672 | .669 | .707 | .741 | 1.000 | .496 | .504 | .533 | .480 | .502 | .546 | .374 | .368 | .430 | .375 | .373 | .398 | .280 | .369 | .319 | .331 | .296 | .388 | .406 | .456 | .349 | .467 | .422 | .483 |
| Abe1 | .521 | .472 | .500 | .456 | .496 | 1.000 | .647 | .607 | .405 | .502 | .541 | .498 | .403 | .464 | .353 | .342 | .343 | .286 | .310 | .264 | .309 | .275 | .394 | .333 | .393 | .329 | .292 | .422 | .394 |
| Abe2 | .493 | .530 | .516 | .564 | .504 | .647 | 1.000 | .728 | .596 | .607 | .662 | .362 | .371 | .458 | .476 | .439 | .420 | .331 | .443 | .354 | .440 | .324 | .418 | .435 | .411 | .355 | .406 | .499 | .486 |
| Abe3 | .494 | .513 | .525 | .562 | .533 | .607 | .728 | 1.000 | .655 | .672 | .683 | .456 | .428 | .524 | .448 | .403 | .457 | .410 | .506 | .453 | .522 | .369 | .483 | .453 | .450 | .391 | .435 | .457 | .498 |
| Abe4 | .377 | .459 | .450 | .466 | .480 | .405 | .596 | .655 | 1.000 | .658 | .675 | .420 | .438 | .494 | .448 | .447 | .414 | .385 | .494 | .490 | .527 | .398 | .438 | .432 | .459 | .421 | .445 | .475 | .494 |
| Abe5 | .488 | .536 | .555 | .495 | .502 | .502 | .607 | .672 | .658 | 1.000 | .767 | .384 | .449 | .518 | .545 | .402 | .451 | .440 | .439 | .408 | .502 | .419 | .431 | .466 | .481 | .524 | .504 | .405 | .448 |
| Abe6 | .479 | .572 | .524 | .525 | .546 | .541 | .662 | .683 | .675 | .767 | 1.000 | .424 | .435 | .539 | .499 | .488 | .398 | .441 | .540 | .459 | .491 | .385 | .412 | .424 | .451 | .424 | .450 | .438 | .489 |
| Aex1 | .461 | .402 | .547 | .360 | .374 | .498 | .362 | .456 | .420 | .384 | .424 | 1.000 | .790 | .684 | .582 | .588 | .573 | .558 | .479 | .524 | .498 | .439 | .421 | .352 | .468 | .439 | .398 | .442 | .406 |
| Aex2 | .386 | .379 | .457 | .368 | .368 | .403 | .371 | .428 | .438 | .449 | .435 | .790 | 1.000 | .759 | .634 | .612 | .599 | .557 | .484 | .517 | .535 | .463 | .405 | .356 | .526 | .493 | .472 | .459 | .452 |
| Aex3 | .417 | .425 | .493 | .410 | .430 | .464 | .458 | .524 | .494 | .518 | .539 | .684 | .759 | 1.000 | .730 | .695 | .630 | .518 | .518 | .559 | .537 | .448 | .400 | .472 | .582 | .525 | .514 | .466 | .493 |
| Aex4 | .395 | .393 | .432 | .382 | .375 | .353 | .476 | .448 | .448 | .545 | .499 | .582 | .634 | .730 | 1.000 | .704 | .643 | .495 | .533 | .542 | .570 | .526 | .406 | .484 | .553 | .560 | .587 | .544 | .512 |
| Aex5 | .341 | .458 | .409 | .394 | .373 | .342 | .439 | .403 | .447 | .402 | .488 | .588 | .612 | .695 | .704 | 1.000 | .685 | .499 | .545 | .577 | .552 | .487 | .393 | .449 | .482 | .448 | .473 | .498 | .451 |
| Aex6 | .407 | .375 | .398 | .408 | .398 | .343 | .420 | .457 | .414 | .451 | .398 | .573 | .599 | .630 | .643 | .685 | 1.000 | .530 | .509 | .510 | .562 | .499 | .406 | .471 | .482 | .467 | .509 | .524 | .495 |
| Aprb1 | .295 | .382 | .424 | .306 | .280 | .286 | .331 | .410 | .385 | .440 | .441 | .558 | .557 | .518 | .495 | .499 | .530 | 1.000 | .730 | .647 | .663 | .574 | .491 | .403 | .510 | .494 | .425 | .424 | .393 |
| Aprb2 | .294 | .425 | .345 | .414 | .369 | .310 | .443 | .506 | .494 | .439 | .540 | .479 | .484 | .518 | .533 | .545 | .509 | .730 | 1.000 | .649 | .689 | .579 | .537 | .524 | .521 | .482 | .536 | .524 | .552 |
| Aprb3 | .339 | .440 | .335 | .367 | .319 | .264 | .354 | .453 | .490 | .408 | .459 | .524 | .517 | .559 | .542 | .577 | .510 | .647 | .649 | 1.000 | .701 | .622 | .481 | .427 | .526 | .491 | .501 | .477 | .476 |
| Aprb4 | .288 | .398 | .356 | .396 | .331 | .309 | .440 | .522 | .527 | .502 | .491 | .498 | .535 | .537 | .570 | .552 | .562 | .663 | .689 | .701 | 1.000 | .667 | .486 | .492 | .502 | .472 | .473 | .448 | .494 |
| Aprb5 | .356 | .381 | .326 | .304 | .296 | .275 | .324 | .369 | .398 | .419 | .385 | .439 | .463 | .448 | .526 | .487 | .499 | .574 | .579 | .622 | .667 | 1.000 | .481 | .458 | .454 | .463 | .560 | .565 | .507 |
| Ainfo1 | .327 | .350 | .370 | .384 | .388 | .394 | .418 | .483 | .438 | .431 | .412 | .421 | .405 | .400 | .406 | .393 | .406 | .491 | .537 | .481 | .486 | .481 | 1.000 | .795 | .680 | .519 | .572 | .580 | .630 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ainfo2 | .331 | .356 | .322 | .406 | .406 | .333 | .435 | .453 | .432 | .466 | .424 | .352 | .356 | .472 | .484 | .449 | .471 | .403 | .524 | .427 | .492 | .458 | .795 | 1.000 | .750 | .589 | .649 | .610 | .674 |
| Ainfo3 | .416 | .405 | .427 | .464 | .456 | .393 | .411 | .450 | .459 | .481 | .451 | .468 | .526 | .582 | .553 | .482 | .482 | .510 | .521 | .526 | .502 | .454 | .680 | .750 | 1.000 | .697 | .653 | .619 | .649 |
| Ainfo4 | .398 | .419 | .347 | .390 | .349 | .329 | .355 | .391 | .421 | .524 | .424 | .439 | .493 | .525 | .560 | .448 | .467 | .494 | .482 | .491 | .472 | .463 | .519 | .589 | .697 | 1.000 | .651 | .551 | .613 |
| Ainfo5 | .411 | .377 | .371 | .428 | .467 | .292 | .406 | .435 | .445 | .504 | .450 | .398 | .472 | .514 | .587 | .473 | .509 | .425 | .536 | .501 | .473 | .560 | .572 | .649 | .653 | .651 | 1.000 | .724 | .781 |
| Ainfo6 | .404 | .408 | .319 | .437 | .422 | .422 | .499 | .457 | .475 | .405 | .438 | .442 | .459 | .466 | .544 | .498 | .524 | .424 | .524 | .477 | .448 | .565 | .580 | .610 | .619 | .551 | .724 | 1.000 | .752 |
| Ainfo7 | .445 | .418 | .362 | .508 | .483 | .394 | .486 | .498 | .494 | .448 | .489 | .406 | .452 | .493 | .512 | .451 | .495 | .393 | .552 | .476 | .494 | .507 | .630 | .674 | .649 | .613 | .781 | .752 | 1.000 |

a. Determinant = 5.75E-012

## Appendix 8: Anti-Image Correlation Matrix (Interaction Quality)

| Anti-image Correlation | Aatt1 | Aatt2 | Aatt3 | Aatt4 | Aatt5 | Abe1 | Abe2 | Abe3 | Abe4 | Abe5 | Abe6 | Aex1 | Aex2 | Aex3 | Aex4 | Aex5 | Aex6 | Aprb1 | Aprb2 | Aprb3 | Aprb4 | Aprb5 | Ainfo1 | Ainfo2 | Ainfo3 | Ainfo4 | Ainfo5 | Ainfo6 | Ainfo7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aatt1 | .941[a] | -.306 | -.279 | .047 | -.170 | -.090 | -.045 | -.043 | .097 | -.001 | -.007 | -.111 | .033 | .052 | -.035 | .142 | -.142 | .083 | .067 | -.079 | .121 | -.133 | .081 | .014 | -.048 | -.063 | .008 | .016 | -.111 |
| Aatt2 | -.306 | .944[a] | -.050 | -.321 | -.134 | -.010 | -.031 | .048 | .034 | -.096 | -.066 | .035 | -.004 | .026 | .089 | -.204 | .138 | -.035 | -.041 | -.133 | .025 | -.048 | .033 | -.036 | .100 | -.136 | .109 | -.070 | .058 |
| Aatt3 | -.279 | -.050 | .910[a] | -.312 | -.257 | .068 | -.114 | .046 | -.038 | -.162 | .072 | -.305 | .128 | -.091 | -.036 | -.053 | .117 | -.264 | .143 | .154 | .048 | -.050 | -.110 | .093 | -.058 | .118 | -.069 | .162 | .068 |
| Aatt4 | .047 | -.321 | -.312 | .938[a] | -.269 | .056 | -.088 | -.108 | .056 | .044 | .026 | .110 | -.065 | .063 | .033 | .024 | -.090 | .152 | -.101 | -.032 | -.092 | .094 | .048 | .014 | -.086 | -.035 | .076 | -.052 | -.142 |
| Aatt5 | -.170 | -.134 | -.257 | -.269 | .947[a] | -.142 | .138 | -.017 | -.121 | .095 | -.114 | .126 | -.043 | -.013 | .016 | .033 | -.091 | .082 | -.049 | .043 | -.004 | .063 | -.004 | -.037 | -.039 | .117 | -.170 | .009 | .015 |
| Abe1 | -.090 | -.010 | .068 | .056 | -.142 | .913[a] | -.354 | -.131 | .194 | -.121 | -.056 | -.285 | .100 | -.154 | .131 | .007 | .056 | .053 | .040 | .112 | .004 | -.051 | -.134 | .133 | -.086 | -.038 | .163 | -.133 | -.029 |
| Abe2 | -.045 | -.031 | -.114 | -.088 | .138 | -.354 | .937[a] | -.305 | -.148 | .041 | -.138 | .209 | -.057 | .086 | -.165 | -.066 | -.016 | .009 | -.026 | .044 | -.050 | .098 | .041 | -.093 | .079 | .060 | .027 | -.139 | -.007 |
| Abe3 | -.043 | .048 | .046 | -.108 | -.017 | -.131 | -.305 | .960[a] | -.158 | -.177 | -.062 | -.089 | .086 | -.142 | .086 | .131 | -.085 | .037 | -.074 | -.063 | -.103 | .073 | -.120 | .039 | .043 | .062 | -.015 | .020 | -.007 |
| Abe4 | .097 | .034 | -.038 | .056 | -.121 | .194 | -.148 | -.158 | .953[a] | -.248 | -.150 | -.090 | -.005 | -.033 | .129 | -.049 | .036 | .157 | -.051 | -.117 | -.099 | .010 | -.031 | .065 | -.043 | -.031 | .100 | -.138 | -.061 |
| Abe5 | -.001 | -.096 | -.162 | .044 | .095 | -.121 | .041 | -.177 | -.248 | .910[a] | -.466 | .218 | -.125 | .054 | -.208 | .195 | -.135 | -.086 | .159 | .091 | -.061 | -.053 | .011 | -.114 | .062 | -.189 | -.179 | .125 | .158 |
| Abe6 | -.007 | -.066 | .072 | .026 | -.114 | -.056 | -.138 | -.062 | -.150 | -.466 | .945[a] | -.046 | .065 | -.078 | .032 | -.170 | .183 | -.037 | -.172 | -.029 | .056 | .037 | .044 | .040 | -.010 | .085 | .049 | .024 | -.119 |
| Aex1 | -.111 | .035 | -.305 | .110 | .126 | -.285 | .209 | -.089 | -.090 | .218 | -.046 | .910[a] | -.515 | -.016 | -.088 | -.038 | -.085 | -.053 | -.031 | -.107 | -.007 | .066 | -.036 | -.057 | .110 | -.045 | .050 | -.075 | .041 |
| Aex2 | .033 | -.004 | .128 | -.065 | -.043 | .100 | -.057 | .086 | -.005 | -.125 | .065 | -.515 | .921[a] | -.368 | .006 | -.040 | -.044 | -.073 | .051 | .117 | -.085 | -.031 | -.120 | .254 | -.129 | -.008 | -.047 | -.001 | -.040 |
| Aex3 | .052 | .026 | -.091 | .063 | -.013 | -.154 | .086 | -.142 | -.033 | .054 | -.078 | -.016 | -.368 | .947[a] | -.270 | -.174 | -.062 | .004 | -.002 | -.127 | .084 | .036 | .217 | -.170 | -.105 | -.006 | -.006 | .127 | -.046 |
| Aex4 | -.035 | .089 | -.036 | .033 | .016 | .131 | -.165 | .086 | .129 | -.208 | .032 | -.088 | .006 | -.270 | .957[a] | -.257 | -.073 | .107 | -.069 | .000 | -.095 | -.053 | .045 | .036 | -.042 | -.097 | -.092 | -.104 | .049 |
| Aex5 | .142 | -.204 | -.053 | .024 | .033 | .007 | -.066 | .131 | -.049 | .195 | -.170 | -.038 | -.040 | -.174 | -.257 | .944[a] | -.345 | .065 | -.044 | -.117 | -.010 | -.010 | .001 | -.068 | .037 | .021 | .001 | -.040 | .067 |
| Aex6 | -.142 | .138 | .117 | -.090 | -.091 | .056 | -.016 | -.085 | .036 | -.135 | .183 | -.085 | -.044 | -.062 | -.073 | -.345 | .952[a] | -.169 | .049 | .040 | -.080 | -.013 | .079 | -.096 | .080 | .021 | .011 | -.088 | -.037 |
| Aprb1 | .083 | -.035 | -.264 | .152 | .082 | .053 | .009 | .037 | .157 | -.086 | -.037 | -.053 | -.073 | .004 | .107 | .065 | -.169 | .918[a] | -.469 | -.152 | -.155 | -.066 | -.131 | .147 | -.119 | -.134 | .074 | -.073 | .107 |
| Aprb2 | .067 | -.041 | .143 | -.101 | -.049 | .040 | -.026 | -.074 | -.051 | .159 | -.172 | -.031 | .051 | -.002 | -.069 | -.044 | .049 | -.469 | .949[a] | -.053 | -.141 | -.042 | -.018 | -.086 | .066 | .035 | -.084 | .019 | -.078 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aprb3 | -.079 | -.133 | .154 | -.032 | .043 | .112 | .044 | -.063 | -.117 | .091 | -.029 | -.107 | .117 | -.127 | .000 | -.117 | .040 | -.152 | -.053 | .953[a] | -.254 | -.154 | -.131 | .177 | -.125 | -.011 | -.090 | .027 | .037 |
| Aprb4 | .121 | .025 | .048 | -.092 | -.004 | .004 | -.050 | -.103 | -.099 | -.061 | .056 | -.007 | -.085 | .084 | -.095 | -.010 | -.080 | -.155 | -.141 | -.254 | .950[a] | -.331 | .084 | -.123 | -.005 | .027 | .099 | .176 | -.097 |
| Aprb5 | -.133 | -.048 | -.050 | .094 | .063 | -.051 | .098 | .073 | .010 | -.053 | .037 | .066 | -.031 | .036 | -.053 | -.010 | -.013 | -.066 | -.042 | -.154 | -.331 | .953[a] | -.070 | -.004 | .121 | .027 | -.132 | -.226 | .030 |
| Ainfo1 | .081 | .033 | -.110 | .048 | -.004 | -.134 | .041 | -.120 | -.031 | .011 | .044 | -.036 | -.120 | .217 | .045 | .001 | .079 | -.131 | -.018 | -.131 | .084 | -.070 | .924[a] | -.569 | -.092 | .050 | .039 | -.016 | -.128 |
| Ainfo2 | .014 | -.036 | .093 | .014 | -.037 | .133 | -.093 | .039 | .065 | -.114 | .040 | -.057 | .254 | -.170 | .036 | -.068 | -.096 | .147 | -.086 | .177 | -.123 | -.004 | -.569 | .905[a] | -.353 | -.045 | -.076 | -.022 | -.074 |
| Ainfo3 | -.048 | .100 | -.058 | -.086 | -.039 | -.086 | .079 | .043 | -.043 | .062 | -.010 | .110 | -.129 | -.105 | -.042 | .037 | .080 | -.119 | .066 | -.125 | -.005 | .121 | -.092 | -.353 | .953[a] | -.293 | -.036 | -.118 | .022 |
| Ainfo4 | -.063 | -.136 | .118 | -.035 | .117 | -.038 | .060 | .062 | -.031 | -.189 | .085 | -.045 | -.008 | -.006 | -.097 | .021 | .021 | -.134 | .035 | -.011 | .027 | .027 | .050 | -.045 | -.293 | .960[a] | -.172 | .046 | -.133 |
| Ainfo5 | .008 | .109 | -.069 | .076 | -.170 | .163 | .027 | -.015 | .100 | -.179 | .049 | .050 | -.047 | -.006 | -.092 | .001 | .011 | .074 | -.084 | -.090 | .099 | -.132 | .039 | -.076 | -.036 | -.172 | .946[a] | -.252 | -.375 |
| Ainfo6 | .016 | -.070 | .162 | -.052 | .009 | -.133 | -.139 | .020 | -.138 | .125 | .024 | -.075 | -.001 | .127 | -.104 | -.040 | -.088 | -.073 | .019 | .027 | .176 | -.226 | -.016 | -.022 | -.118 | .046 | -.252 | .948[a] | -.274 |
| Ainfo7 | -.111 | .058 | .068 | -.142 | .015 | -.029 | -.007 | -.007 | -.061 | .158 | -.119 | .041 | -.040 | -.046 | .049 | .067 | -.037 | .107 | -.078 | .037 | -.097 | .030 | -.128 | -.074 | .022 | -.133 | -.375 | -.274 | .952[a] |

## Appendix 9: Correlation Matrix (Physical Environment Quality)

| Correlation | Bam1 | Bam2 | Bam3 | Bam4 | Bam5 | Beq1 | Beq2 | Beq3 | Beq4 | Beq5 | Beq6 | Bphy1 | Bphy2 | Bphy3 | Bphy4 | Bsoc1 | Bsoc2 | Bsoc3 | Bsoc4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bam1 | 1.000 | .816 | .780 | .669 | .722 | .665 | .609 | .477 | .611 | .675 | .663 | .614 | .613 | .605 | .610 | .094 | .107 | .144 | .133 |
| Bam2 | .816 | 1.000 | .835 | .675 | .771 | .709 | .698 | .555 | .601 | .620 | .628 | .694 | .692 | .658 | .652 | .055 | .090 | .133 | .079 |
| Bam3 | .780 | .835 | 1.000 | .749 | .810 | .686 | .665 | .497 | .636 | .681 | .612 | .668 | .693 | .678 | .659 | .048 | .086 | .128 | .068 |
| Bam4 | .669 | .675 | .749 | 1.000 | .766 | .617 | .550 | .503 | .588 | .601 | .493 | .540 | .567 | .548 | .588 | .171 | .150 | .128 | .148 |
| Bam5 | .722 | .771 | .810 | .766 | 1.000 | .716 | .624 | .516 | .629 | .572 | .577 | .621 | .613 | .595 | .603 | .094 | .144 | .164 | .119 |
| Beq1 | .665 | .709 | .686 | .617 | .716 | 1.000 | .860 | .610 | .736 | .658 | .601 | .654 | .634 | .608 | .592 | .044 | .114 | .123 | .071 |
| Beq2 | .609 | .698 | .665 | .550 | .624 | .860 | 1.000 | .684 | .685 | .595 | .611 | .667 | .659 | .649 | .610 | .045 | .110 | .079 | .085 |
| Beq3 | .477 | .555 | .497 | .503 | .516 | .610 | .684 | 1.000 | .627 | .600 | .515 | .488 | .458 | .467 | .514 | .204 | .202 | .221 | .173 |
| Beq4 | .611 | .601 | .636 | .588 | .629 | .736 | .685 | .627 | 1.000 | .765 | .628 | .600 | .588 | .577 | .572 | .062 | .100 | .180 | .127 |
| Beq5 | .675 | .620 | .681 | .601 | .572 | .658 | .595 | .600 | .765 | 1.000 | .666 | .593 | .629 | .613 | .616 | .184 | .176 | .212 | .207 |
| Beq6 | .663 | .628 | .612 | .493 | .577 | .601 | .611 | .515 | .628 | .666 | 1.000 | .590 | .577 | .562 | .542 | .127 | .205 | .239 | .213 |
| Bphy1 | .614 | .694 | .668 | .540 | .621 | .654 | .667 | .488 | .600 | .593 | .590 | 1.000 | .847 | .799 | .738 | .065 | .172 | .187 | .181 |
| Bphy2 | .613 | .692 | .693 | .567 | .613 | .634 | .659 | .458 | .588 | .629 | .577 | .847 | 1.000 | .855 | .752 | .050 | .122 | .149 | .192 |
| Bphy3 | .605 | .658 | .678 | .548 | .595 | .608 | .649 | .467 | .577 | .613 | .562 | .799 | .855 | 1.000 | .808 | .083 | .135 | .156 | .231 |
| Bphy4 | .610 | .652 | .659 | .588 | .603 | .592 | .610 | .514 | .572 | .616 | .542 | .738 | .752 | .808 | 1.000 | .112 | .178 | .145 | .181 |
| Bsoc1 | .094 | .055 | .048 | .171 | .094 | .044 | .045 | .204 | .062 | .184 | .127 | .065 | .050 | .083 | .112 | 1.000 | .827 | .672 | .623 |
| Bsoc2 | .107 | .090 | .086 | .150 | .144 | .114 | .110 | .202 | .100 | .176 | .205 | .172 | .122 | .135 | .178 | .827 | 1.000 | .776 | .697 |
| Bsoc3 | .144 | .133 | .128 | .128 | .164 | .123 | .079 | .221 | .180 | .212 | .239 | .187 | .149 | .156 | .145 | .672 | .776 | 1.000 | .698 |
| Bsoc4 | .133 | .079 | .068 | .148 | .119 | .071 | .085 | .173 | .127 | .207 | .213 | .181 | .192 | .231 | .181 | .623 | .697 | .698 | 1.000 |

a. Determinant = 5.28E-009

## Appendix 10: Anti-Image Correlation Matrix (Physical Environment Quality)

| Anti-image Correlation | Bam1 | Bam2 | Bam3 | Bam4 | Bam5 | Beq1 | Beq2 | Beq3 | Beq4 | Beq5 | Beq6 | Bphy1 | Bphy2 | Bphy3 | Bphy4 | Bsocial1 | Bsocial2 | Bsocial3 | Bsocial4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bam1 | .951[a] | -.408 | -.111 | -.084 | -.054 | -.085 | .055 | .123 | .012 | -.165 | -.222 | -.009 | .085 | -.002 | -.052 | -.057 | .073 | .031 | -.084 |
| Bam2 | -.408 | .947[a] | -.310 | .027 | -.133 | -.034 | -.083 | -.157 | .116 | .092 | -.035 | -.103 | -.096 | .047 | -.032 | -.023 | .060 | -.066 | .063 |
| Bam3 | -.111 | -.310 | .932[a] | -.241 | -.328 | .163 | -.185 | .175 | .035 | -.258 | .031 | .032 | -.031 | -.104 | .010 | .075 | -.016 | -.121 | .164 |
| Bam4 | -.084 | .027 | -.241 | .949[a] | -.323 | -.058 | .083 | -.097 | -.073 | -.030 | .091 | .049 | -.061 | .067 | -.106 | -.166 | .036 | .151 | -.092 |
| Bam5 | -.054 | -.133 | -.328 | -.323 | .930[a] | -.291 | .202 | -.090 | -.123 | .254 | -.084 | -.028 | .010 | -.007 | -.010 | .028 | -.053 | .018 | -.030 |
| Beq1 | -.085 | -.034 | .163 | -.058 | -.291 | .904[a] | -.643 | .139 | -.161 | -.202 | .097 | -.050 | .018 | .041 | .030 | .079 | -.047 | -.097 | .118 |
| Beq2 | .055 | -.083 | -.185 | .083 | .202 | -.643 | .878[a] | -.406 | -.096 | .250 | -.156 | -.019 | -.078 | -.112 | .031 | -.018 | -.083 | .223 | -.058 |
| Beq3 | .123 | -.157 | .175 | -.097 | -.090 | .139 | -.406 | .914[a] | -.129 | -.227 | -.008 | -.010 | .114 | .055 | -.123 | -.097 | .073 | -.118 | .027 |
| Beq4 | .012 | .116 | .035 | -.073 | -.123 | -.161 | -.096 | -.129 | .948[a] | -.413 | -.090 | -.071 | .041 | -.001 | -.004 | .082 | .086 | -.152 | .021 |
| Beq5 | -.165 | .092 | -.258 | -.030 | .254 | -.202 | .250 | -.227 | -.413 | .905[a] | -.224 | .061 | -.137 | -.011 | -.071 | -.156 | .050 | .079 | -.066 |
| Beq6 | -.222 | -.035 | .031 | .091 | -.084 | .097 | -.156 | -.008 | -.090 | -.224 | .965[a] | -.056 | -.008 | -.001 | .027 | .101 | -.086 | -.058 | -.025 |
| Bphy1 | -.009 | -.103 | .032 | .049 | -.028 | -.050 | -.019 | -.010 | -.071 | .061 | -.056 | .955[a] | -.433 | -.153 | -.119 | .105 | -.126 | -.039 | .061 |
| Bphy2 | .085 | -.096 | -.031 | -.061 | .010 | .018 | -.078 | .114 | .041 | -.137 | -.008 | -.433 | .937[a] | -.403 | -.041 | .039 | .034 | -.014 | -.061 |
| Bphy3 | -.002 | .047 | -.104 | .067 | -.007 | .041 | -.112 | .055 | -.001 | -.011 | -.001 | -.153 | -.403 | .930[a] | -.421 | -.071 | .137 | .005 | -.183 |
| Bphy4 | -.052 | -.032 | .010 | -.106 | -.010 | .030 | .031 | -.123 | -.004 | -.071 | .027 | -.119 | -.041 | -.421 | .955[a] | .055 | -.156 | .095 | .063 |
| Bsoc1 | -.057 | -.023 | .075 | -.166 | .028 | .079 | -.018 | -.097 | .082 | -.156 | .101 | .105 | .039 | -.071 | .055 | .769[a] | -.621 | -.079 | -.053 |
| Bsoc2 | .073 | .060 | -.016 | .036 | -.053 | -.047 | -.083 | .073 | .086 | .050 | -.086 | -.126 | .034 | .137 | -.156 | -.621 | .749[a] | -.396 | -.223 |
| Bsoc3 | .031 | -.066 | -.121 | .151 | .018 | -.097 | .223 | -.118 | -.152 | .079 | -.058 | -.039 | -.014 | .005 | .095 | -.079 | -.396 | .815[a] | -.345 |
| Bsoc4 | -.084 | .063 | .164 | -.092 | -.030 | .118 | -.058 | .027 | .021 | -.066 | -.025 | .061 | -.061 | -.183 | .063 | -.053 | -.223 | -.345 | .858[a] |

a. Measures of Sampling Adequacy(MSA)

## Appendix 11: Correlation Matrix (Outcome Quality)

| Correlation | Cwa1 | Cwa2 | Cwa3 | Cwa4 | Cwa5 | Cco2 | Cco3 | Cco4 | Cco5 | Cco6 | Cval1 | Cval2 | Cval3 | Csec1 | Csec2 | Csec3 | Csec5 | Csec6 | Csec7 | Crel4 | Csp1 | Csp2 | Csp3 | Csp4 | Csp5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cwa1 | 1.000 | .697 | .726 | .459 | .604 | .330 | .280 | .265 | .199 | .216 | .189 | .311 | .401 | .488 | .484 | .402 | .222 | .263 | .237 | .280 | .342 | .395 | .426 | .353 | .371 |
| Cwa2 | .697 | 1.000 | .788 | .453 | .585 | .316 | .250 | .256 | .260 | .167 | .262 | .339 | .410 | .401 | .400 | .388 | .309 | .321 | .318 | .399 | .417 | .436 | .465 | .404 | .386 |
| Cwa3 | .726 | .788 | 1.000 | .580 | .711 | .392 | .385 | .293 | .344 | .198 | .205 | .320 | .457 | .489 | .489 | .434 | .247 | .311 | .273 | .376 | .388 | .449 | .531 | .499 | .454 |
| Cwa4 | .459 | .453 | .580 | 1.000 | .733 | .272 | .291 | .217 | .214 | .107 | .124 | .167 | .360 | .389 | .373 | .306 | .212 | .264 | .206 | .256 | .302 | .386 | .404 | .342 | .443 |
| Cwa5 | .604 | .585 | .711 | .733 | 1.000 | .360 | .343 | .277 | .285 | .149 | .200 | .255 | .454 | .443 | .432 | .385 | .215 | .281 | .202 | .304 | .333 | .387 | .469 | .435 | .508 |
| Cco2 | .330 | .316 | .392 | .272 | .360 | 1.000 | .690 | .661 | .606 | .547 | .217 | .254 | .388 | .440 | .406 | .270 | .221 | .281 | .143 | .204 | .277 | .227 | .318 | .362 | .294 |
| Cco3 | .280 | .250 | .385 | .291 | .343 | .690 | 1.000 | .664 | .647 | .589 | .144 | .238 | .308 | .488 | .507 | .266 | .198 | .266 | .073 | .149 | .153 | .184 | .293 | .381 | .243 |
| Cco4 | .265 | .256 | .293 | .217 | .277 | .661 | .664 | 1.000 | .730 | .714 | .256 | .258 | .327 | .377 | .389 | .326 | .238 | .304 | .122 | .080 | .127 | .146 | .201 | .273 | .159 |
| Cco5 | .199 | .260 | .344 | .214 | .285 | .606 | .647 | .730 | 1.000 | .590 | .233 | .281 | .360 | .357 | .387 | .358 | .257 | .257 | .163 | .256 | .263 | .277 | .331 | .382 | .323 |
| Cco6 | .216 | .167 | .198 | .107 | .149 | .547 | .589 | .714 | .590 | 1.000 | .268 | .290 | .280 | .276 | .317 | .254 | .257 | .251 | .155 | .159 | .152 | .196 | .214 | .230 | .104 |
| Cval1 | .189 | .262 | .205 | .124 | .200 | .217 | .144 | .256 | .233 | .268 | 1.000 | .770 | .717 | .096 | .100 | .236 | .411 | .453 | .337 | .390 | .260 | .213 | .300 | .328 | .316 |
| Cval2 | .311 | .339 | .320 | .167 | .255 | .254 | .238 | .258 | .281 | .290 | .770 | 1.000 | .801 | .266 | .287 | .347 | .403 | .412 | .325 | .478 | .385 | .370 | .430 | .380 | .387 |
| Cval3 | .401 | .410 | .457 | .360 | .454 | .388 | .308 | .327 | .360 | .280 | .717 | .801 | 1.000 | .367 | .377 | .386 | .399 | .434 | .335 | .512 | .429 | .432 | .529 | .550 | .570 |
| Csec1 | .488 | .401 | .489 | .389 | .443 | .440 | .488 | .377 | .357 | .276 | .096 | .266 | .367 | 1.000 | .853 | .597 | .343 | .391 | .301 | .261 | .475 | .496 | .487 | .426 | .368 |
| Csec2 | .484 | .400 | .489 | .373 | .432 | .406 | .507 | .389 | .387 | .317 | .100 | .287 | .377 | .853 | 1.000 | .655 | .296 | .350 | .213 | .261 | .413 | .461 | .461 | .402 | .336 |
| Csec3 | .402 | .388 | .434 | .306 | .385 | .270 | .266 | .326 | .358 | .254 | .236 | .347 | .386 | .597 | .655 | 1.000 | .413 | .400 | .403 | .364 | .473 | .478 | .387 | .357 | .397 |
| Csec5 | .222 | .309 | .247 | .212 | .215 | .221 | .198 | .238 | .257 | .257 | .411 | .403 | .399 | .343 | .296 | .413 | 1.000 | .711 | .651 | .419 | .341 | .348 | .343 | .387 | .300 |
| Csec6 | .263 | .321 | .311 | .264 | .281 | .281 | .266 | .304 | .257 | .251 | .453 | .412 | .434 | .391 | .350 | .400 | .711 | 1.000 | .712 | .363 | .293 | .281 | .305 | .396 | .311 |
| Csec7 | .237 | .318 | .273 | .206 | .202 | .143 | .073 | .122 | .163 | .155 | .337 | .325 | .335 | .301 | .213 | .403 | .651 | .712 | 1.000 | .428 | .397 | .330 | .316 | .383 | .323 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crel4 | .280 | .399 | .376 | .256 | .304 | .204 | .149 | .080 | .256 | .159 | .390 | .478 | .512 | .261 | .261 | .364 | .419 | .363 | .428 | 1.000 | .557 | .581 | .556 | .569 | .464 |
| Csp1 | .342 | .417 | .388 | .302 | .333 | .277 | .153 | .127 | .263 | .152 | .260 | .385 | .429 | .475 | .413 | .473 | .341 | .293 | .397 | .557 | 1.000 | .799 | .680 | .539 | .580 |
| Csp2 | .395 | .436 | .449 | .386 | .387 | .227 | .184 | .146 | .277 | .196 | .213 | .370 | .432 | .496 | .461 | .478 | .348 | .281 | .330 | .581 | .799 | 1.000 | .716 | .563 | .618 |
| Csp3 | .426 | .465 | .531 | .404 | .469 | .318 | .293 | .201 | .331 | .214 | .300 | .430 | .529 | .487 | .461 | .387 | .343 | .305 | .316 | .556 | .680 | .716 | 1.000 | .714 | .624 |
| Csp4 | .353 | .404 | .499 | .342 | .435 | .362 | .381 | .273 | .382 | .230 | .328 | .380 | .550 | .426 | .402 | .357 | .387 | .396 | .383 | .569 | .539 | .563 | .714 | 1.000 | .652 |
| Csp5 | .371 | .386 | .454 | .443 | .508 | .294 | .243 | .159 | .323 | .104 | .316 | .387 | .570 | .368 | .336 | .397 | .300 | .311 | .323 | .464 | .580 | .618 | .624 | .652 | 1.000 |

## Appendix 12: Anti-Image Correlation Matrix (Outcome Quality)

| Anti-image Correlation | Cwa1 | Cwa2 | Cwa3 | Cwa4 | Cwa5 | Cco2 | Cco3 | Cco4 | Cco5 | Cco6 | Cval1 | Cval2 | Cval3 | Csec1 | Csec2 | Csec3 | Csec5 | Csec6 | Csec7 | Crel4 | Csp1 | Csp2 | Csp3 | Csp4 | Csp5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cwa1 | .936[a] | -.272 | -.272 | .050 | -.143 | -.044 | .073 | -.055 | .186 | -.124 | .043 | -.062 | -.021 | -.085 | -.070 | .007 | .020 | .044 | -.036 | .039 | .044 | -.025 | -.001 | .057 | -.057 |
| Cwa2 | -.272 | .907[a] | -.508 | .046 | -.047 | -.013 | .065 | -.119 | .025 | .086 | -.087 | -.017 | .083 | .063 | -.042 | .062 | -.101 | .031 | -.044 | -.104 | -.108 | -.013 | .010 | .064 | .023 |
| Cwait3 | -.272 | -.508 | .906[a] | -.123 | -.209 | -.036 | -.105 | .123 | -.134 | .041 | .078 | -.018 | -.054 | -.004 | .027 | -.104 | .117 | -.038 | -.023 | .027 | .100 | -.029 | -.084 | -.138 | .089 |
| Cwait4 | .050 | .046 | -.123 | .892[a] | -.506 | .054 | -.084 | -.068 | .077 | .043 | .016 | .117 | -.092 | .003 | -.026 | .064 | -.036 | -.027 | -.044 | -.007 | .029 | -.120 | -.028 | .135 | -.081 |
| Cwait5 | -.143 | -.047 | -.209 | -.506 | .916[a] | -.031 | -.010 | -.023 | .010 | .039 | -.026 | .080 | -.082 | -.030 | .028 | -.076 | .021 | -.028 | .081 | -.013 | .021 | .082 | -.045 | -.004 | -.141 |
| Cco2 | -.044 | -.013 | -.036 | .054 | -.031 | .919[a] | -.329 | -.217 | -.069 | -.086 | .012 | .128 | -.158 | -.109 | .079 | .082 | .003 | -.025 | .030 | -.046 | -.195 | .130 | .005 | .056 | -.045 |
| Cco3 | .073 | .065 | -.105 | -.084 | -.010 | -.329 | .896[a] | -.080 | -.211 | -.209 | .068 | -.145 | .125 | -.109 | -.157 | .150 | .004 | -.059 | .108 | -.005 | .094 | .082 | .035 | -.169 | -.043 |
| Cco4 | -.055 | -.119 | .123 | -.068 | -.023 | -.217 | -.080 | .850[a] | -.442 | -.399 | -.057 | .035 | -.054 | -.069 | .070 | -.136 | .047 | -.129 | .090 | .197 | .057 | -.004 | .052 | -.086 | .124 |
| Cco5 | .186 | .025 | -.134 | .077 | .010 | -.069 | -.211 | -.442 | .902[a] | -.059 | .022 | .016 | -.010 | .081 | -.034 | -.080 | -.051 | .093 | -.031 | -.112 | -.026 | -.001 | -.036 | .037 | -.151 |
| Cco6 | -.124 | .086 | .041 | .043 | .039 | -.086 | -.209 | -.399 | -.059 | .879[a] | -.086 | -.045 | .054 | .128 | -.069 | .017 | -.066 | .082 | -.104 | -.035 | .046 | -.152 | -.046 | .051 | .116 |
| Cval1 | .043 | -.087 | .078 | .016 | -.026 | .012 | .068 | -.057 | .022 | -.086 | .880[a] | -.419 | -.294 | .069 | .121 | -.046 | -.044 | -.185 | .047 | .001 | -.042 | .101 | -.002 | -.032 | .013 |
| Cval2 | -.062 | -.017 | -.018 | .117 | .080 | .128 | -.145 | .035 | .016 | -.045 | -.419 | .869[a] | -.507 | .014 | -.023 | -.042 | -.029 | -.001 | .009 | -.094 | -.056 | -.041 | -.084 | .178 | .060 |
| Cval3 | -.021 | .083 | -.054 | -.092 | -.082 | -.158 | .125 | -.054 | -.010 | .054 | -.294 | -.507 | .907[a] | -.021 | -.095 | .058 | .008 | .024 | .023 | -.084 | .061 | .040 | .005 | -.145 | -.229 |
| Csec1 | -.085 | .063 | -.004 | .003 | -.030 | -.109 | -.109 | -.069 | .081 | .128 | .069 | .014 | -.021 | .893[a] | -.647 | -.013 | -.052 | -.031 | -.115 | .110 | -.117 | -.079 | -.045 | .006 | .045 |
| Csec2 | -.070 | -.042 | .027 | -.026 | .028 | .079 | -.157 | .070 | -.034 | -.069 | .121 | -.023 | -.095 | -.647 | .860[a] | -.387 | .047 | -.116 | .191 | .015 | .045 | -.021 | -.063 | -.026 | .093 |
| Csec3 | .007 | .062 | -.104 | .064 | -.076 | .082 | .150 | -.136 | -.080 | .017 | -.046 | -.042 | .058 | -.013 | -.387 | .919[a] | -.106 | .063 | -.160 | -.077 | -.107 | -.036 | .133 | .082 | -.122 |
| Csec5 | .020 | -.101 | .117 | -.036 | .021 | .003 | .004 | .047 | -.051 | -.066 | -.044 | -.029 | .008 | -.052 | .047 | -.106 | .922[a] | -.384 | -.215 | -.060 | .069 | -.071 | -.040 | -.041 | .051 |
| Csec6 | .044 | .031 | -.038 | -.027 | -.028 | -.025 | -.059 | -.129 | .093 | .082 | -.185 | -.001 | .024 | -.031 | -.116 | .063 | -.384 | .876[a] | -.483 | .006 | .076 | .003 | .055 | -.033 | -.022 |
| Csec7 | -.036 | -.044 | -.023 | -.044 | .081 | .030 | .108 | .090 | -.031 | -.104 | .047 | .009 | .023 | -.115 | .191 | -.160 | -.215 | -.483 | .857[a] | -.099 | -.161 | .114 | .037 | -.082 | -.032 |
| Crel4 | .039 | -.104 | .027 | -.007 | -.013 | -.046 | -.005 | .197 | -.112 | -.035 | .001 | -.094 | -.084 | .110 | .015 | -.077 | -.060 | .006 | -.099 | .941[a] | -.062 | -.198 | -.028 | -.231 | .118 |
| Csp1 | .044 | -.108 | .100 | .029 | .021 | -.195 | .094 | .057 | -.026 | .046 | -.042 | -.056 | .061 | -.117 | .045 | -.107 | .069 | .076 | -.161 | -.062 | .906[a] | -.499 | -.184 | -.006 | -.078 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Csp2 | -.025 | -.013 | -.029 | -.120 | .082 | .130 | .082 | -.004 | -.001 | -.152 | .101 | -.041 | .040 | -.079 | -.021 | -.036 | -.071 | .003 | .114 | -.198 | -.499 | .904[a] | -.214 | .023 | -.216 |
| Csp3 | -.001 | .010 | -.084 | -.028 | -.045 | .005 | .035 | .052 | -.036 | -.046 | -.002 | -.084 | .005 | -.045 | -.063 | .133 | -.040 | .055 | .037 | -.028 | -.184 | -.214 | .950[a] | -.365 | -.050 |
| Csp4 | .057 | .064 | -.138 | .135 | -.004 | .056 | -.169 | -.086 | .037 | .051 | -.032 | .178 | -.145 | .006 | -.026 | .082 | -.041 | -.033 | -.082 | -.231 | -.006 | .023 | -.365 | .918[a] | -.285 |
| Csp5 | -.057 | .023 | .089 | -.081 | -.141 | -.045 | -.043 | .124 | -.151 | .116 | .013 | .060 | -.229 | .045 | .093 | -.122 | .051 | -.022 | -.032 | .118 | -.078 | -.216 | -.050 | -.285 | .928[a] |

**Appendix 13: Squared Multiple Correlations ($R^2$) for Interaction Quality**

| Items | Estimate | Items | Estimate |
|---|---|---|---|
| Aatt1 | .679 | Aex5 | .639 |
| Aatt2 | .749 | Aex6 | .551 |
| Aatt3 | .719 | Aprb2 | .748 |
| Aatt4 | .630 | Aprb3 | .648 |
| Abe1 | .480 | Aprb4 | .520 |
| Abe2 | .513 | Aprb5 | .608 |
| Abe4 | .599 | Ainfo1 | .495 |
| Abe5 | .523 | Ainfo3 | .586 |
| Abe6 | .516 | Ainfo4 | .586 |
| Aex1 | .524 | Ainfo5 | .689 |
| Aex2 | .585 | Ainfo6 | .613 |
| Aex3 | .315 | Ainfo7 | .546 |
| Aex4 | .673 | | |

**Appendix 14: Squared Multiple Correlations ($R^2$) for Physical Environment Quality**

| Items | Estimate | Items | Estimate |
|---|---|---|---|
| Bam1 | .661 | Bphys1 | .435 |
| Bam2 | .699 | Bphys2 | .673 |
| Bam3 | .773 | Bphys3 | .569 |
| Bam4 | .593 | Bphys4 | .604 |
| Bam5 | .652 | Bsocial1 | .604 |
| Bequip1 | .424 | Bsocial2 | .668 |
| Bequip2 | .417 | Bsocial3 | .659 |
| Bequip4 | .467 | Bsocial4 | .694 |
| Bequip6 | .432 | | |

**Appendix 15: Squared Multiple Correlations ($R^2$) for Second Order Model (Physical Environment Quality)**

| Items | Estimate | Items | Estimate |
|---|---|---|---|
| Bam1 | .660 | Bphys1 | .435 |
| Bam2 | .698 | Bphys2 | .674 |
| Bam3 | .772 | Bphys3 | .570 |
| Bam4 | .593 | Bphys4 | .607 |
| Bam5 | .652 | Bsocial1 | .602 |
| Bequip1 | .424 | Bsocial2 | .668 |
| Bequip2 | .416 | Bsocial3 | .660 |
| Bequip4 | .467 | Bsocial4 | .695 |
| Bequip6 | .432 | QPE1 | .622 |
| | | QPE2 | .671 |
| | | QPE3 | .254 |