

## **MEASURING AND MODELLING INTERNET BANKING SERVICE QUALITY IN SOUTH AFRICA**

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### **—Abstract—**

The purpose of this study was to develop a measuring and modelling instrument of Internet banking service quality (IBSQ) for the South African banking sector. Snowball and convenience sampling, both non-probability techniques were used to recruit participants for the study. A total of 310 Internet banking customer responses were utilised in the analysis. Using exploratory factor analysis (EFA), eight determinant factors that explained IBSQ were extracted. Following this, the study determined the causal relationship amongst IBSQ, customer value, satisfaction and loyalty through correlation analysis and structural equation modelling (SEM). The proposed model indicates that IBSQ, comprising eight factors, positively influences customer value, satisfaction and loyalty. The model found customer satisfaction to be a predictor of customer loyalty in an Internet banking context. Contrary to the hypothesised model, the influence of customer value was limited to customer satisfaction. The influence of customer value on customer loyalty was found to be rather weak; it influenced customer loyalty only indirectly through customer satisfaction. Understanding the intricate relationships amongst service quality, customer value, satisfaction and loyalty will definitely enhance banks' understanding consumer behaviour and decision making in this digital era. The model may assist bankers to measure, manage and improve IBSQ. Banks could utilise this measurement model to design and improve their Internet banking services.

**Key Words:** IBSQ, value, satisfaction, loyalty, consumer behaviour, SEM

**JEL Classification:** M3; M30; M31.

## 1. INTRODUCTION

A challenging global business environment has propelled banks across the world to be innovative and to use alternative delivery channels such as Internet banking, mobile banking and automated teller machine (ATM) banking. Technological developments and financial liberalisation (deregulation) are considered as the main factors influencing developments in the banking sector (Aziz, Elbadrawy & Hussien, 2014). With the introduction of these service outlets, banks aim to attract more customers, deliver superior service (create value) for their customers, satisfy their customers and build long-lasting relationships with their customers.

Over the past few decades, several research studies have been conducted on service and service quality measurements on traditional forms of businesses (Adil, 2013), with limited attention to electronic services. The concept of service quality from an electronic service perspective is described as the clients' overall evaluation and judgement of excellence and quality of electronic service offerings in the virtual marketplace (Santos, 2003). This description suggests that, unlike the evaluation of traditional service offerings, customers in an electronic environment are less likely to evaluate each sub-process in detail during a single visit to a bank's website. Clients in an electronic banking environment are likely to perceive the service as an overall process and outcome (Van Riel, Liljander & Jurriëns, 2001).

There has been long-standing debate regarding the application of existing popular models such as the SERVQUAL model across a broad range of service categories. Dabholkar, Thorpe and Rentz (1996) argue that a single measure of service quality across industries is not feasible. These authors suggest that future research on service quality should involve the development of industry-specific measures of service quality. Such arguments signal a move from attempts to adapt the SERVQUAL to the development of alternative industry-specific measures. As a result, studies have been conducted in electronic service quality across different settings. However, there is increasing evidence of variation in the outcomes of studies on the dimensions of electronic service quality that have surfaced in an attempt to address the key attributes of service quality of online services, directly

or indirectly (Jun & Cai, 2001; Barnes & Vidgen, 2003; Santos, 2003; Han & Baek, 2004; Parasuraman, Zeithaml & Malhotra, 2005; Narteh, 2013). The scale developed by Parasuraman *et al.* (2005) referred to as the Electronic Service Quality instrument (E-SQ) comprises seven dimensions, namely efficiency, fulfilment, system availability, privacy, responsiveness, compensation and contact. In a study conducted in the Irish online banking sector, Loonam and O'Loughlin (2008) identified ten dimensions, namely web usability, security, information quality, access, trust, reliability, flexibility, responsiveness, self-recovery and personalisation/customisation that are focal to e-service quality delivery, with the applicability of each of the proposed dimensions to e-banking.

Currently, all major commercial banks in South Africa offer Internet banking facilities to their customers. Research in areas of service quality of Internet banking in South Africa is scant and limited in scope. Hence a research gap was identified that dealt with empirical work in the conceptualisation, measurement and modelling of the services of Internet banking. Therefore, the purpose of this study was to develop a measuring and modelling instrument of Internet banking service quality (IBSQ) for the South African banking sector. In addition, the study aimed to determine the relationships between the constructs of IBSQ, customer value, satisfaction and loyalty formed the empirical objectives of the study.

## **2. LITERATURE REVIEW**

### ***Service quality***

Many early models of service quality, including the Nordic Model of Service Quality (Grönroos, 1984) and SERVQUAL (Parasuraman, Zeithaml & Berry, 1985, 1988) were based on the disconfirmation model applied in the physical goods' literature. The disconfirmation model is based on the premise that service quality is perceived through a comparison between expectations and experiences of a number of service quality dimensions (Grönroos, 2007). Cronin and Taylor (1994) were amongst the scholars who levelled serious criticism on the SERVQUAL scale, and subsequently introduced their own performance-only scale called the SERVPERF. Cronin and Taylor (1994) questioned the conceptual basis of the SERVQUAL scale and found it confusing with the customer satisfaction construct. SERVPERF was developed by conducting research in four industries, namely banks, pest control, dry cleaning and fast foods. Service quality has been measured in businesses - ranging from financial services to restaurants.

Parasuraman *et al.* (1985) are of the view that perceived service quality results from a comparison of customers' prior expectations about a service and their perceptions after the actual experience of the service encounter. If expectations are greater than performance, then perceived quality is less than satisfactory and may result in customer dissatisfaction. In the context of this study, service quality is defined as the consumer's evaluative judgement about an entity's overall excellence or superiority in providing desired benefits (Van Riel *et al.*, 2001; Santos, 2003).

### ***Customer value***

By introducing alternatives to traditional banking, banks aim to create value for their customers. Zeithaml (1988) describe customer value as "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given". In this context value is, therefore, a trade-off between what the customer received such as quality, benefits, worth or utilities and what the customer gave up to acquire and use the product, for example, price or any other sacrifice. In literature focusing on the service industry, it is argued that customer value is the result of a customer's perception of the value received, where value equals perceived service quality relative to price (Hallowell, 1996). It is a subjective norm since it involves an evaluative judgment of what is received and sacrificed (Ruiz-Molina & Gil-Saura, 2008).

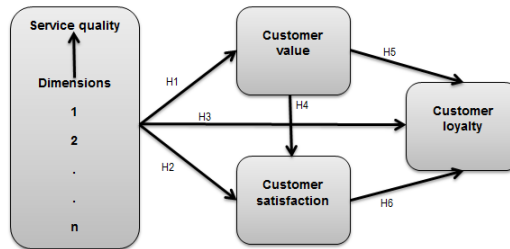
### ***Customer satisfaction***

Customer satisfaction is a must-achieve objective for any business. In services marketing literature there has been a long-standing debate on the concept of satisfaction (Dong, 2003). Lovelock and Wright (1999:88) define satisfaction as "the outcome of the subjective evaluation that the chosen alternative meets or exceeds expectations". This denotes that the two variables that determine satisfaction are expected and perceived service. The basis of this definition stems from the disconfirmation paradigm as a post-purchase evaluation (Torres, Summers & Belleau, 2001). Satisfaction is also considered from a perspective of cumulative satisfaction and is defined as the customers' overall experience with the service provider after a series of service encounters (Johnson, Gustafsson, Andreassen, Lervik & Cha, 2001). The majority of the past studies view satisfaction from a cumulative perspective to measure the construct (Gupta & Zeithaml, 2006).

### ***Customer loyalty***

Customer satisfaction is closely related with customer loyalty. Loyalty can be described as a consumer's inclination to patronise a given firm or chain of firms over time (Knox & Denison, 2000). Loyalty consists of two dimensions, namely behavioural and attitudinal aspects (Dong, 2003). The behavioural aspect of loyalty focuses on a measure of the proportion of purchase of a specific brand, while attitudinal loyalty is measured by a psychological commitment to a firm. Koo (2006) conducted a study to identify the variables that determine customer loyalty. The results revealed that customers' favourable perceptions of website design, visual appeal, well-organised hyperlinks, information quality, product assortment and after-sale services are positively associated with online store loyalty. The main advantages of having loyal customers include insensitivity of customers to price increases, possibility of cross-selling, resistance to competition, positive attitude, and of course increased revenue, profit and market share (Cronin, Brady & Hult, 2000; Iacobucci, 2016).

The relationships between service quality, customer value, customer satisfaction and customer loyalty or behavioural intentions have stimulated interest among marketing scholars both in online and in offline service settings (Parasuraman *et al.*, 1988; Cronin *et al.*, 2000; Han & Baek, 2004; Kuo, Wu & Deng, 2009; Lee, 2010). Patterson and Spreng (1997) established that each performance dimension is positively linked to perceived value and in turn perceived value is linked positively to customer satisfaction and (re)purchase intentions. Similarly, other studies have indicated that service quality as a precondition for customer satisfaction (Boshoff & Du Plessis, 2009). The literature also suggests that there is a direct link between service quality and customer loyalty (Koo, 2006). A few studies also suggest a direct link between customer satisfaction and customer loyalty (Dong, 2003). In a study on the relationships between service quality, perceived value, customer satisfaction, and post-purchase intention of mobile value-added services, Kuo *et al.* (2009) found that service quality positively influences perceived value and customer satisfaction, suggesting that when companies provide good service quality, perceived value and customer satisfaction can be improved. The results further attest that perceived value and customer satisfaction directly and positively influence customer loyalty. In light of the research objective of this study and the literature reviewed, the proposed hypothesised research model is presented in Figure 1.



**Figure 1: Proposed research model**

The proposed research model hypothesises a set ( $n$ ) of dimensions that determine IBSQ that positively influence customer value, customer satisfaction and customer loyalty. Furthermore, the model also hypothesises that customer value influences both customer satisfaction and customer loyalty; while customer satisfaction is perceived to be a predictor of customer loyalty. To support the hypothesised research model, the following hypotheses are formulated:

*H<sub>1</sub>: Internet banking service quality positively influences customer value.*

*H<sub>2</sub>: Internet banking service quality positively influences customer satisfaction.*

*H<sub>3</sub>: Internet banking service quality positively influences customer loyalty.*

*H<sub>4</sub>: Customer value positively influences customer satisfaction.*

*H<sub>5</sub>: Customer value positively influences customer loyalty.*

*H<sub>6</sub>: Customer satisfaction positively influences customer loyalty.*

### **3. RESEARCH DESIGN**

The study adopted a sequential-mixed method approach to achieve the formulated objectives. Qualitative data were first collected and analysed. Thereafter, quantitative research was conducted. Use of the sequential-mixed method approach is in line with the practice of the development of a service model (or a scale) where a qualitative research is first conducted followed by quantitative research (Churchill, 1979; Parasuraman *et al.*, 1988). Following a critical study of the extant literature (inductive analysis) and initial generation of a pool of items, a focus group interview comprising five participants and separate in-depth interviews with three participants were conducted to generate original items and descriptions of what constitutes service quality of Internet banking in a South African context (deductive analysis). The findings of the qualitative study (Redda, Surujlal & Leendertz, 2015) were used in compiling items for the questionnaire. This paper reports only the quantitative part of the study. The quantitative part of

the research, which involved the use of a questionnaire to collect data, and refine and validate the scale through various statistical applications, was conducted in Southern Gauteng, South Africa in 2015. Since a sampling frame could not be obtained from banks for security and privacy reasons, a probability sampling could not be used in this study. Therefore, snowball and convenience sampling, both non-probability techniques were applied to conduct the study.

### ***Instrument and procedures***

A questionnaire requesting demographic information of participants and scaled items was developed for the study. The scaled items included service quality with eight latent factors collectively comprising of 31 items, five items for customer value, four items for satisfaction and five items for loyalty. All scaled responses were recorded on a six-point Likert-type scale ranging from strongly disagree (1) to strongly agree (6). The use of even number response categories is often preferred especially when the researcher wants to eliminate the neutral effect (Garland, 1991). The questionnaire was pre-tested with three experts in the discipline to check whether any changes were required before administering it to Internet banking customers. Furthermore, to ensure reliability, the questionnaire was pilot-tested on a sample of 50 conveniently selected Internet banking customers that did not form part of the main study. Four hundred (N=400) questionnaires were administered over a one-month period through Survey monkey and self-administration to the identified sample. Of these data captured, 310 completed questionnaires were used in the final analysis. This sample size in this study (n=310) is consistent with similar previous studies conducted on Internet banking services using a non-probability sampling technique (Santos, 2003; Parasuraman, *et al.*, 2005).

## **4. DATA ANALYSIS**

The statistical programs IBM Statistical Packages for the Social Sciences (SPSS version 22.0) and the Analysis for Moment Structures (AMOS version 22.0) for Microsoft Windows, were used to perform analysis for the quantitative data. Descriptive statistics, exploratory factor analysis (EFA), correlation analysis and structural equation modelling (SEM) were computed to address the research objectives.

## **5. RESULTS AND DISCUSSION**

**Sample profile**

Of the 310 respondents, 53 percent (n=163) were male and 47 percent (n=144) were female. The majority of the respondents were aged between 25-34 (34%) followed by the 35-44 (33%) age cohort and the 45-54 (13%) age cohort. The youngest age cohort (18-25) and the oldest age cohort (54-64) were in the minority representing eight percent and 12 percent of the respondents respectively. The majority (31%; n=95) of respondents earned an annual income in the category R250 001 to R350 000, followed by 29 percent (n=89), R350 001 to R450 000, and 15 percent (n=46) in the R450 001 to R550 000 category. A majority (66%) of the respondents indicated that they use Internet banking for most of their banking needs suggesting that they had adequate knowledge and experience of the service provided. In terms of how long the respondents had been using Internet banking, 65 percent (n=199) of the respondents indicated that they had been using Internet banking for more than three years, which depicts a solid experience of usage of the service.

**Exploratory factor analysis (EFA)**

Exploratory factor analysis was conducted to identify the underlying service quality dimensions (factors) that influence Internet banking services and consumer decision making in South Africa. Furthermore, separate factor analyses were conducted on the other three constructs, namely value, satisfaction and loyalty to assess whether the items in each of the constructs adequately explained their respective constructs. Table 1 presents a summary pattern matrix of factors and constructs.

**Table 1: Summary pattern matrix of factors and constructs**

Factors / Constructs	No. of items	Eigen value	% of variance	Cumulative%	Cronbach`s alpha
Factor 1	4	11.7	37.8	37.8	0.921
Factor 2	6	3.2	10.3	48.1	0.940
Factor 3	6	2.2	7.0	55.2	0.883
Factor 4	3	1.9	6.2	61.4	0.931
Factor 5	3	1.8	5.8	67.2	0.934
Factor 6	3	1.5	4.7	71.9	0.827
Factor 7	3	1.3	4.2	76.1	0.874
Factor 8	3	1.1	3.5	79.7	0.924
Value	5	3.4	67.3	67.3	0.875
Satisfaction	4	3.0	74.2	74.2	0.883
Loyalty	5	3.2	63.1	63.1	0.847



The dataset was assessed for its suitability for factor analysis using sample size determination, the Kaiser-Myer-Olkin (KMO) and the Bartlett's test of sphericity. In terms of sample size, it is recommended that the size should be more than 150 and there should be ratio of at least five cases per variable (Pallant, 2013). In this study, the sample (310) yielded a ratio of ten cases for each variable. The result of the KMO measure of sampling adequacy indicated that the 31-item scale sufficiently meets the necessary threshold at 0.893 (Malhotra, 2010). Furthermore the Bartlett's test of sphericity was significant ( $p < .05$ ) indicating the dataset was appropriate for the factor analysis (Pallant, 2013). The factor extraction method applied was principal component analysis (PCA) with Oblimin with Kaiser Normalisation. Factor loadings greater than 0.30 were used as a threshold for the extraction of factors.

The eigenvalues and percentage of variance explained were used in determining the factors that influence IBSQ. The eigenvalue extraction indicated that the eight factors were appropriate and best fit for capturing and explaining the IBSQ construct. These eight factors are the building blocks upon which South African Internet banking customers base their decisions. The eight factors accounted approximately 79 percent of the variance (cumulative variance), which is considered more than acceptable (Hair, Black, Babin & Anderson, 2010). Thus, the IBSQ construct is explained collectively by eight factors. Furthermore, the Cronbach alpha reliability for each factor was above 0.8 portraying very good reliability (Hair *et al.*, 2010). With respect to the other three constructs, a similar method was applied. The cumulative variance for customer value, satisfaction and loyalty were approximately 67 percent, 74 percent and 63 percent respectively. The Cronbach alpha reliability for these three constructs also portrayed very good reliability as illustrated on Table 1.

After careful examination and scrutiny of the items that loaded together to describe the IBSQ construct, the factors were named and operational descriptions provided. Factor one, named *efficiency* refers to the speed at which the electronic banking facility enables customers to complete their banking transactions. Factor two, labelled *privacy and security* refers to the degree to which customers find transacting through electronic banking safe and secure. Factor three, named *contact and responsiveness* refers to the ability of the bank to be contacted to and be responsive of when customers need it, encounter problems and/or to solve problems. Factor four, *ease of use* refers to the accessing and using the bank's

website for searching, navigating and transacting electronically with less effort. Factor five, named *reliability*, relates to the extent to which the bank keeps its promise with regard to electronic banking, provide dependable service and keep accurate records of transactions conducted over the Internet. Factor six named *site aesthetics* refers the extent to which customers find bank’s websites and designs to be visually appealing and attractive. Factor seven, labelled *functionality*, refers to the sum or any aspect of the electronic banking as a product can do for the customer. The last factor, named *system availability*, describes the operational availability of the bank’s website for electronic banking transactions.

Determining the relationships between the constructs IBSQ, customer value, satisfaction and loyalty formed the empirical objectives of the study. To address these objectives, first correlation analysis was computed.

**Correlation analysis**

Table 2 provides the correlation between eight of the dimensions, IBSQ, customer satisfaction and customer loyalty.

**Table 2: Correlation matrix**

Factors / Constructs	F1	F2	F3	F4	F5	F6	F7	F8	IBSQ	Val	Sat	Loy
Factor 1	1											
Factor 2	.24	1										
Factor 3	.39	.28	1									
Factor 4	.24	.41	.41	1								
Factor 5	.39	.46	.50	.41	1							
Factor 6	.39	.41	.34	.49	.45	1						
Factor 7	.40	.40	.42	.47	.49	.46	1					
Factor 8	.38	.39	.42	.44	.39	.48	.37	1				
IBSQ	.67	.62	.65	.69	.71	.69	.77	.66	1			
Value	.33	.32	.38	.36	.36	.32	.32	.47	.50	1		
Satisfaction	.40	.46	.44	.43	.53	.50	.44	.54	.66	.71	1	
Loyalty	.31	.29	.40	.32	.42	.34	.40	.40	.52	.47	.55	1

Statistically significant at  $p \leq 0.01$  (2-tailed)

A two-tailed significance level is assumed at the cut off level  $p < 0.01$ . On inspection of each pair of correlation, the Pearson’s correlation coefficient at  $p < 0.01$  level of significance indicates a positive linear association between each of the dimensions and constructs suggesting nomological validity, and none of the

coefficients were above 0.9 so there were no multicollinearity issues (Hair *et al.*, 2010). As can be seen from Table 2, the correlations between each pair of the eight dimensions that collectively explained IBSQ were significant, ranging from  $r=0.242$  to  $r= 0.460$  at  $p<0.01$  level of significance, suggesting the existence of positive inter-factor associations. In addition, the correlations between each of the eight dimensions that collectively constitute the IBSQ construct also showed statistically significant associations with customer value, satisfaction and loyalty. The relationship between IBSQ, customer value, satisfaction and loyalty was also found to be positive and significant.

To assess the causal effect of the relationships detected through correlations analysis further, and to test the hypothesised research model specified earlier, structural equation modelling (SEM) was performed. The establishment of nomological validity and the absence of multicollinearity issues made it possible to perform SEM as a confirmatory factor analysis.

### ***Structural equation modelling (SEM)***

In line with the hypothesised research model, four constructs are identified in the model, namely IBSQ, customer value, satisfaction and loyalty. Following the recommendation of Malhotra (2010) and Hair *et al.* (2010) the measurement model was specified and identified, and the measured indicator items were assigned to latent constructs. Figure 2 depicts the hypothesised specified measurement model. IBSQ, with eight latent factors, collectively comprised 31 items, with five items for customer value (Val), four items for satisfaction (Sat) and five items for loyalty (Loy). The eight latent factors are the dimensions of IBSQ (extracted through EFA), namely reliability, system availability, privacy and security, website aesthetics, ease of use, functionality, efficiency, and contact and responsiveness.

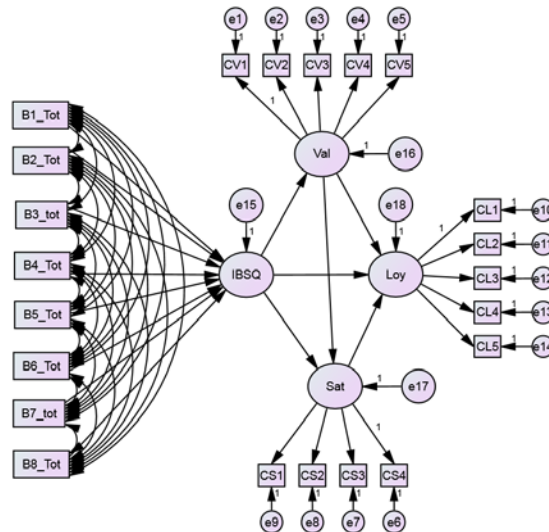


Figure 2: Specified measurement model

### ***Reliability and validity of the measurement model***

Composite reliability (CR), average variance extracted (AVE) and the correlation coefficients were computed to determine the reliability and validity of the scale. The CR results were above the cut off 0.7 level, suggesting a good internal consistency of the scale. It must be borne in mind that the Cronbach alpha reliability, of the all the factors extracted that constituted the scale, were above 0.8 portraying very good reliability (Hair *et al.*, 2010). In terms of validity, AVE values for all constructs were above 0.50 indicating evidence of convergent validity of the scale (Malhotra, 2010). In addition, an average inter-item correlation of the scale fell within the suggested range of 0.15 and 0.50 which indicates acceptable discriminant validity (Clark & Watson, 1995). Factor loadings of the items had absolute value scores above 0.5 which further confirms that convergent validity was acceptable in this study.

### ***Assessment of goodness-of-fit indices***

Four competing models were identified in order to test the hypothesised research model and identify the best model fit. Table 3 reports on the goodness-of-fit indices of the competing models. Structural Model A is a three-construct model that included IBSQ, customer value and loyalty. Similarly, Structural Model B is

also a three-construct model that included IBSQ, customer satisfaction and loyalty. However, Structural Model C and D are models that included four of the constructs of this study, namely IBSQ, customer value, satisfaction and loyalty.

**Table 3: Goodness-of-fit indices for the competing models**

Indices	Acceptable level	Structural Model A	Structural Model B	Structural Model C	Structural Model D
$\chi^2/df$	$\leq 5$	3.027	2.833	2.786	2.775
IFI	$\geq 0.90$	0.899	0.918	0.903	0.903
TLI	$\geq 0.90$	0.882	0.903	0.889	0.890
CFI	$\geq 0.90$	0.898	0.917	0.903	0.903
RMSEA	$< 0.08$	0.081	0.077	0.076	0.076

The chi-square test ( $X^2$ ) is viewed as an overly strict indicator of model fit, given its power to detect even trivial deviations from the proposed model. Mueller (1996) suggested that the chi-square test statistic be divided by degrees of freedom where an acceptable level is observed at  $<3$ . Interpretation of the size of this value depends largely on the viewpoint of the investigator, but in practice, some interpret ratios as high as three, four or even five as still representing a good model fit (Mueller, 1996). All the competing models exhibited good model fit with regard to the chi-square test. The indices used to assess the goodness-of-fit of the structural models include incremental fit index (IFI), Tucker Lewis index (TLI) and comparative fit index (CFI). Indices values closer to one indicate a perfect fit and those closer to zero represent no fit (Malhotra, 2010; Hair *et al.*, 2010:665). With regard to root mean square error of approximation (RMSEA), there is a good model fit if RMSEA is less than or equal to 0.05 and an adequate fit if RMSEA is less than or equal to 0.08 (Blunch, 2008). Blunch (2008) is of the view that models with RMSEA values of 0.10 and larger should not be accepted. Overall, Structural Model A exhibited poor goodness-of-fit indices while Structural Model B produced much improved and acceptable indices. Of the remaining two Structural Models (C & D) that included four of the constructs, Structural Model D provided better fit producing overall acceptable fit indices with the exception of Tucker Lewis index (TLI) missing the threshold with 0.010. On a scale of zero being no fit and one being perfect fit, Model D is still an acceptable model fit for the dataset and for purposes of testing the hypothesised research model. In the following section, analyses of the percentage of mediation effect and standardised regression weights are used to test the hypothesised research model further.

**Structural model and mediation effects**

Table 4 provides standardised regression weights of the four competing models.

**Table 4: Standardised regression weights: IBSQ, satisfaction, value & loyalty**

Models	Constructs			Standardised regression weights	p-value
Structural Model A	Val	←	IBSQ	0.909	***
	Loy	←	IBSQ	0.729	***
	Loy	←	Val	0.310	***
	Mediation effect of customer value on loyalty = <b>27.86%</b>				
Structural Model B	Sat	←	IBSQ	1.17	***
	Loy	←	IBSQ	0.432	0.01
	Loy	←	Sat	0.512	***
	Mediation effect of customer satisfaction on loyalty = <b>58.05%</b>				
Structural Model C	Val	←	IBSQ	0.601	***
	Sat	←	IBSQ	0.455	***
	Sat	←	Val	0.560	***
	Loy	←	IBSQ	0.285	0.009
	Loy	←	Sat	0.080	0.492
	Combined mediation effect of customer value & satisfaction on loyalty = <b>60.16%</b>				
Structural Model D	Val	←	IBSQ	0.936	***
	Sat	←	IBSQ	0.668	***
	Loy	←	IBSQ	0.410	0.011
	Sat	←	Val	0.534	***
	Loy	←	Sat	0.529	***

The causal effects are read in the direction of the arrows. In Structural Model A, the results suggest that IBSQ has a statistically significant positive influence on customer value and on loyalty, and customer value in return has positive effect on loyalty. In this three-construct model, the mediating effect of customer value on loyalty was calculated to be 27.86 percent. In Structural Model B, also a three-construct model, the results indicate that IBSQ has a statistically significant positive influence on satisfaction and on customer loyalty and customer satisfaction in return has significant positive effect on customer loyalty. In this three-construct model, the mediating effect of customer satisfaction on loyalty was estimated to be 58.05 percent much higher than the percentage of mediation effect of customer value on loyalty.

In Structural Model C, two constructs (customer satisfaction and loyalty) play a mediating role together. The regression path estimates suggested that IBSQ yields positive effect on three of the constructs, namely customer value, satisfaction and loyalty. However, the regression path estimate of customer value on loyalty was reduced by two thirds of its original effect without the intervention of customer satisfaction. In this four-construct model, the combined mediating effect of

customer value and satisfaction on loyalty was estimated to be 60.16 percent, where once again a diminished effect is observed with regard to the influence of customer value on loyalty. In this Model, the influence of IBSQ on value, satisfaction and loyalty is significant. In turn, value also positively influenced satisfaction while satisfaction was found not to be a predictor of loyalty.

Figure 3 exhibits the regression path estimates (coefficients) of the fourth competing Structural Model (D). The direct effect of customer value on loyalty was removed in light of the diminished mediation effect observed in Structural Model C. Moreover, Structural Model D did exhibit a better-fit indices compared to Structural Model C. The regression path estimates suggest that IBSQ yields positive effect on three of the constructs namely customer value, satisfaction and loyalty. Furthermore, the regression path estimates indicate that customer value in return has a positive effect on satisfaction but not on loyalty. Customer satisfaction, in return, is indicated to have a positive effect on customer loyalty. The results of standardised regression weights also support these findings. The four-construct Structural Model D indicates that the model fits well in representing the dataset. Therefore, Structural Model (D) was identified and proposed yielding a better fit for the hypothesised research model.

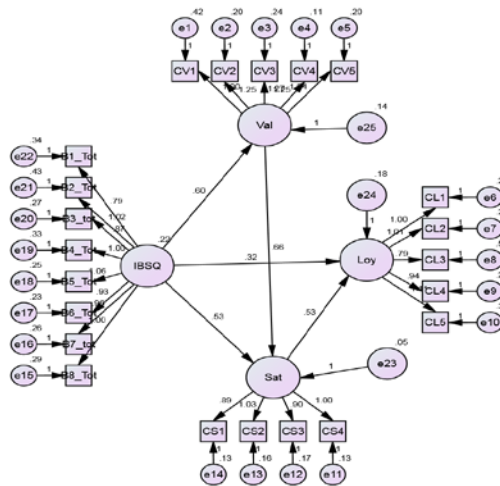


Figure 3: Structural Model D: IBSQ Measurement Model

*Hypotheses testing*

Hypotheses testing was carried out with a significance level set at the conventional  $p < 0.05$  level. The causal effects read in the direction of arrows indicate that IBSQ positively influences customer value significantly (0.936) at  $p < 0.05$  level; IBSQ positively influences satisfaction significantly (0.668) at  $p < 0.05$  level and IBSQ positively influences customer loyalty (0.410) at  $p < 0.05$  level. Accordingly,  $H_1$ ,  $H_2$ , and  $H_3$  are supported. This finding corroborates the results of previous studies conducted in other contexts that found service quality to be a predictor of customer value (Patterson & Spreng, 1997; Cronin *et al.*, 2000; Kuo *et al.*, 2009), customer satisfaction (Cronin *et al.*, 2000; Kuo *et al.*, 2009) and customer loyalty (Parasuraman *et al.*, 1988; Patterson & Spreng, 1997; Koo, 2006; Siddiqi, 2011). Similarly, the causal effects read in the direction of arrows suggest that customer value positively influences satisfaction significantly (0.534) at  $p < 0.05$  level, and customer satisfaction in turn positively influences loyalty significantly (0.529) at  $p < 0.05$  level. Hypotheses  $H_4$  and  $H_6$  are therefore supported. This result is consistent with other studies that established the positive influence of customer value on customer satisfaction (Anuwichanont & Mechinda, 2009), and the positive influence of customer satisfaction on loyalty (Dong, 2003; Siddiqi, 2011).

It must be borne in mind that the direct effect of customer value on loyalty was removed in light of the diminished mediation effect observed in Structural Model C. The influence of customer value on customer loyalty is only indirect through its influence on customer satisfaction. Hypothesis  $H_5$  is therefore rejected. This finding corroborates the finding of Cronin *et al.* (2000) that loyalty does not directly influence customer satisfaction. However, it must be noted that a few previous studies conducted in other contexts have found customer value to have a direct and positive link with customer loyalty (Zeithaml, 1988; Patterson & Spreng, 1997; Lewis & Soureli 2006). Ultimately, a four-construct Structural Model (D) was identified and proposed as yielding a better fit for the hypothesised research model. It is the proposed IBSQ Measurement Model that can be used for measuring and modelling of IBSQ in the South African banking sector.

## **6. CONCLUSIONS AND RECOMMENDATIONS**

Eight determinant factors that explain IBSQ (reliability, system availability, privacy and security, website aesthetics, ease of use, functionality, efficiency, and



contact and responsiveness) were identified. Furthermore, the model has determined the causal relationships among four important constructs, namely IBSQ, customer value, satisfaction, and loyalty. Understanding consumer behaviour and decision making in this digital era will enhance the banks' quest to provide quality services and devise appropriate customer service solutions. The research revealed that reliability, privacy and security are the top concerns customers have with regard to Internet banking. Therefore, it is recommended that banks invest in the robustness of the websites for banking transactions by using cutting-edge technology to protect their customers from illicit criminal activity, as security and trust are of crucial importance to customers when engaging in online transactions. To enhance efficiency of Internet banking, it is recommended that banks should ensure that the service delivered through the bank's website is quick to access for transactions from any location and at any time, the bank's website loads fast all the time and the bank's website does not freeze during a transaction. With regard to contact, responsiveness and system availability, it is recommended that banks need to repair a breakdown on the website quickly as and when it occurs, promptly resolve serious problems that customer encounter, provide prompt feedback to customer requests by e-mail or other means, and improve and closely manage customer complaints.

It must be emphasised that satisfying customers is a 'must achieve' objective for any bank that wishes to remain profitable and relevant in the competitive banking sector. This must be done by providing quality services that create value for customers. Achieving loyal customers who will patronise and associate themselves with the bank is of particular significance for market growth and success. In view of the relationship of IBSQ dimensions with customer value, satisfaction and loyalty, focus must be placed on the individual building blocks of service quality, *inter alia* the factors that influence Internet banking service quality. These are the factors that influence consumer behaviour and decision making in online banking environment. Periodic measurement of the levels of Internet banking service quality through valid and reliable measuring scale should become an integral part of any bank's effort and strategy in improving service quality levels. Using the scale developed in this study, future studies could use a larger sample size to test the robustness of this scale, and obtain more exact result to draw wider generalisations.

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