Chapter 6

Scale Development

Introduction

As mentioned in a previous chapter that discussed item generation, after the questionnaire was pre-tested with 30 respondents, it was found that some items needed to be eliminated and adjusted. Some new items were also added to the new questionnaire in order to improve the scale's construct validity (DeVellis, 2003). Then, the next step of data collection commenced.

In this chapter, the procedures and results of data analyses will be presented. The analyses were based on several published articles and textbooks which were written by well-known and influential marketing scholars such as Churchill (1974; 1979), Parasuraman (1988; 2005), Gerbing (1988) and Hair (1998; 2006a). The chapter begins with the explanation of data collection, data editing, characteristics of the sample, and the assessment of statistical assumptions. Then, the initial results of exploratory and confirmatory factor assessment of the scale are shown in terms of construct reliability and validity. Finally, the dimensions of SERVTRUST scales are presented for service industries; health care, and banking services in particular.

Data Preparation

Data Collection

During data collection, a sample size of 400 was obtained research assistants. The target respondents were Thai consumers who have used services from health care and banking sectors during the previous few months. A quota sampling, which is a non-probability sampling technique, was used to distribute samples by gender, and age, as shown in Table 6.1. The proportions of the sample represented Thailand's population structure as recorded by the National Statistical Office of Thailand (2005).

Table 6.1

Sample Distribution

Age	Gender		Total
	Male	Female	
20-29	49 (12.25%)	49 (12.25%)	98 (24.50%)
30-39	51 (12.75%)	52 (13.00%)	103 (25.75%)
40-49	42 (10.50%)	45 (11.25%)	87 (21.75%)
50-59	26 (6.50%)	28 (7.00%)	54 (13.50%)
> 60	26 (6.50%)	32 (8.00%)	58 (14.50%)
Total	194 (48.50%)	206 (51.50%)	400 (100.00%)

Data Editing and Screening

In this stage, the data from 400 completed questionnaires was coded and transformed using SPSS software. Then, descriptive statistical analysis was used to check for errors that might occur during data entry. Subsequently, the data were re-examined and compared with the original questionnaires. Hence, out-of-range values and data entry errors were corrected. These steps of examination and preparation of the data for multivariate analysis; evaluation of missing data, identification of outliers, and testing the assumptions underlying the techniques were undertaken in line with suggestion by Hair, et al. (2006a).

Evaluation of Missing Data

Missing data is the value of variables which are not available for analysis. This is the primary concern for many researchers because it affects the usable sample size and may cause biases in nonrandom data. If missing values have been found, they have to be corrected (Hair et al., 2006a). However, for this research, there was no missing data at this stage because of prior careful checking by the research assistants.

Detecting and Handling Outliers

An outlier is a unique characteristic of observation and identified as obviously different from others (Hair et al., 2006a). Although there are three approaches to identify an outlier, the univariate detection and Boxplot technique are preferred for use here. The analyses showed that outliers were identified. Also, it was found that approximately 40 variables contained some cases which were considered outliers. Although outliers are usually considered problems, eliminating those cases may lead to the loss of information (Lewis-Beck, Bryman, and Liao, 2004). So, none of those cases were eliminated at this stage.

Testing the Assumptions of Multivariate Analysis

In order to qualify the data for multivariate analysis, at least three statistical assumptions have to met, normality, homoscedasticity, and linearity (Hair et al. (2006a).

1. Normality

Normality is a pre-requisite assumption for most inferential statistical techniques (Coakes, Steed, and Dzidic, 2006), and factor analysis (Ferrando, 1999; Hair et al., 2006a). Although there are many different ways to test the normality of the data, skewness and kurtosis checks are preferable for this study. Skewness and kurtosis within the range of -1.0 to +1.0 indicate the normality of distribution of the data (Muthen and Kaplan, 1985; Boomsma, 1987; Ferrando, 1999). However, they are still acceptable if their absolute values are not greater than 2.0 (Muthen and Kaplan, 1985). From Table 6.2, only two variables have kurtosis greater

than the 2.0 cutoff point. Therefore, the data was not transformed at this point because of the large sample size (Hair et al., 2006a).

Table 6.2

Non-normality Variables

Variable	N	Mean	Standard deviation	Skewness	Kurtosis	Kolmogorov-Smirnov	Sig.
DCOT1	400	6.040	0.957	-1.132	2.310	4.437	.00
DCOF2	400	5.940	1.053	-1.174	2.221	4.604	.00

2. Homoscedasticity

Homoscedasticity was employed to test the equality of variance between groups (Coakes et al., 2006; Hair et al., 2006a). Hair et al. (2006a) indicated that "homoscedasticity is desirable because the variance of the dependent variable being explained in the dependent relationship should not be concentrated in a limited range of the independent value." As a result, a Levene test for homogeneity of variances was conducted and the variables, which were not considered as homoscedasticity, are presented in Table 6.3. Again, the non qualifying variables would not be transformed.

Table 6.3

Heteroscedasticity Variables

Variable	Levene Statistic*	Sig.
DCOF1	4.695	0.031
DINF2	12.154	0.001
DLOY5	5.210	0.023
BBEN8	6.186	0.013
BEXT6	4.075	0.044

* df1=1, df2=398

3. Linearity

Linearity is indicated as an implicit assumption of multivariate techniques, factor analysis and structural equation modeling (Hair et al., 2006a). In order to test for linearity, a non-zero value of correlation coefficient between any pair of variable was considered (Hill, R. C., Griffiths, and Judge, 2001; Ratanasithi, 2005). From analysis, there was no correlation coefficient with a value below zero. This is evidence of the linearity of the data.

Characteristics of the Sample

The characteristics of the sample are presented in Table 6.4. As mentioned in the previous section, the target sample was 400 Thai consumers, who have used services from health care, and banking service providers in recent months. In brief, 48.5% were male while 51.5% were female. 24.5% of the total respondents were between 20-29 years old, 25.8% were 30-39 years old, 21.8% were 40-49 years old, 13.5% were 50-59 years old, and 14.5% were above 60 years of age.

Table 6.4

Characteristics of the Sample

(n = 400)

Characteristics	Detail	Frequency	Percentage
Gender	Male	194	48.5
	Female	206	51.5
Age	20-29	98	24.5
	30-39	103	25.8
	40-49	87	21.8
	50-59	54	13.5
	> 60	58	14.5

Table 6.4 (Continued)

Characteristics	Detail	Frequency	Percentage
Education level	Less than high school graduation	62	15.5
	High school graduation or equivalent	65	16.3
	Some college	63	15.8
	Bachelor's degree or equivalent	182	45.5
	Graduate degree or equivalent	25	6.3
	Post graduate qualification	1	0.3
	No response	2	0.5
Working status	Employed	315	78.8
	Unemployed	85	21.3
Average income per month (Thai baht)	No income	64	16.0
	Less than 10,000	47	11.8
	10,000 - 19,999	172	43.0
	20,000 - 29,999	66	16.5
	30,000 or more	49	12.3
	No response	2	0.5

Exploratory Factor Analysis

Before starting the exploratory factor analysis (EFA), the item-total correlation within individual components, and reliability tests of each component were performed. The purpose was to eliminate items with unacceptable correlation and reliability coefficients, as suggested by Churchill (1974). The results are presented in Table 6.5.

Table 6.5

Cronbach's Alpha and Item-total Correlation of the Constructs

Construct and items	**Cronbach's alpha**			**Item-total correlation**		
	Health care	Banking	Average	Health care	Banking	Average
BEN	0.916	0.926	0.924			
BEN1				0.838**	0.841**	0.843**
BEN2				0.817**	0.841**	0.839**
BEN3				0.841**	0.819**	0.833**
BEN4				0.793**	0.823**	0.809**
BEN5				0.727**	0.722**	0.738**
BEN6				0.811**	0.817**	0.829**
BEN7				0.783**	0.823**	0.805**
BEN8				0.780**	0.835**	0.817**
COF	0.732	0.783	0.763			
COF1				0.660**	0.721**	0.715**
COF2				0.605**	0.687**	0.625**
COF3				0.776**	0.778**	0.733**
COF4				0.777**	0.776**	0.781**
COF5				0.637**	0.696**	0.680**
COT	0.749	0.778	0.766			
COT1				0.628**	0.650**	0.642**
COT2				0.745**	0.746**	0.751**
COT3				0.778**	0.801**	0.783**
COT4				0.721**	0.783**	0.753**
COT5				0.650**	0.646**	0.657**
CRE	0.863	0.883	0.878			
CRE1				0.847**	0.863**	0.876**
CRE2				0.827**	0.856**	0.843**
CRE3				0.757**	0.788**	0.760**
CRE4				0.822**	0.829**	0.846**
CRE5				0.766**	0.790**	0.776**

Table 6.5 (Continued)

Construct and items	Cronbach's alpha			Item-total correlation		
	Health care	Banking	Average	Health care	Banking	Average
EXP	0.815	0.830	0.833			
EXP1				0.670**	0.712**	0.680**
EXP2				0.741**	0.746**	0.744**
EXP3				0.841**	0.766**	0.830**
EXP4				0.756**	0.820**	0.807**
EXP5				0.778**	0.811**	0.806**
EXT	0.907	0.914	0.918			
EXT1				0.798**	0.834**	0.825**
EXT2				0.856**	0.847**	0.871**
EXT3				0.871**	0.876**	0.879**
EXT4				0.841**	0.856**	0.865**
EXT5				0.839**	0.827**	0.835**
EXT6				0.759**	0.777**	0.781**
FRI	0.823	0.839	0.849			
FRI1				0.692**	0.693**	0.703**
FRI2				0.780**	0.836**	0.830**
FRI3				0.726**	0.730**	0.731**
FRI4				0.703**	0.739**	0.765**
FRI5				0.759**	0.781**	0.784**
FRI6				0.728**	0.696**	0.735**
INF	0.767	0.762	0.774			
INF1				0.498**	0.439**	0.479**
INF2				0.641**	0.640**	0.648**
INF3				0.794**	0.788**	0.802**
INF4				0.782**	0.770**	0.789**
INF5				0.613**	0.597**	0.609**
INF6				0.743**	0.781**	0.776**
INT	0.856	0.850	0.864			
INT1				0.833**	0.808**	0.829**
INT2				0.844**	0.846**	0.869**
INT3				0.896**	0.910**	0.920**
INT4				0.870**	0.894**	0.890**
INT5				0.508**	0.447**	0.485**

Table 6.5 (Continued)

Construct and items	Cronbach's alpha			Item-total correlation		
	Health care	Banking	Average	Health care	Banking	Average
POW	0.852	0.864	0.866			
POW1				0.711**	0.718**	0.711**
POW2				0.786**	0.784**	0.802**
POW3				0.769**	0.739**	0.763**
POW4				0.728**	0.747**	0.739**
POW5				0.809**	0.827**	0.823**
POW6				0.756**	0.815**	0.806**
REL	0.812	0.852	0.844			
REL1				0.778**	0.778**	0.800**
REL2				0.758**	0.792**	0.787**
REL3				0.773**	0.828**	0.809**
REL4				0.661**	0.715**	0.698**
REL5				0.713**	0.754**	0.751**
REL6				0.745**	0.764**	0.780**
SIG	0.797	0.804	0.829			
SIG1				0.672**	0.737**	0.739**
SIG2				0.685**	0.749**	0.737**
SIG3				0.680**	0.711**	0.733**
SIG4				0.758**	0.778**	0.800**
SIG5				0.673**	0.565**	0.631**
SIG6				0.706**	0.643**	0.712**
SIG7				0.675**	0.691**	0.706**
TIM	0.839	0.877	0.875			
TIM1				0.769**	0.804**	0.830**
TIM2				0.697**	0.731**	0.720**
TIM3				0.806**	0.872**	0.851**
TIM4				0.848**	0.863**	0.867**
TIM5				0.794**	0.834**	0.831**

Table 6.5 (Continued)

Construct and items	Cronbach's alpha			Item-total correlation		
	Health care	Banking	Average	Health care	Banking	Average
COM	0.871	0.882	0.896			
COM1				0.805**	0.810**	0.830**
COM2				0.825**	0.862**	0.858**
COM3				0.837**	0.846**	0.868**
COM4				0.797**	0.773**	0.809**
COM5				0.811**	0.842**	0.851**
PBS	0.828	0.860	0.865			
PBS1				0.718**	0.676**	0.725**
PBS2				0.799**	0.830**	0.827**
PBS3				0.759**	0.827**	0.820**
PBS4				0.804**	0.838**	0.839**
PBS5				0.785**	0.841**	0.834**
QUA	0.789	0.821	0.825			
QUA1				0.665**	0.660**	0.687**
QUA2				0.659**	0.695**	0.699**
QUA3				0.750**	0.766**	0.795**
QUA4				0.729**	0.724**	0.734**
QUA5				0.759**	0.782**	0.789**
QUA6				0.683**	0.774**	0.764**
SAT	0.921	0.918	0.926			
SAT1				0.844**	0.848**	0.860**
SAT2				0.878**	0.866**	0.887**
SAT3				0.871**	0.870**	0.882**
SAT4				0.879**	0.879**	0.887**
SAT5				0.890**	0.871**	0.882**
CMM	0.925	0.933	0.933			
CMM1				0.815**	0.828**	0.823**
CMM2				0.874**	0.893**	0.888**
CMM3				0.913**	0.915**	0.915**
CMM4				0.897**	0.903**	0.905**
CMM5				0.884**	0.902**	0.905**

Table 6.5 (Continued)

Construct and items	Cronbach's alpha			Item-total correlation		
	Health care	Banking	Average	Health care	Banking	Average
LOY	0.913	0.907	0.915			
LOY1				0.765**	0.780**	0.769**
LOY2				0.839**	0.824**	0.836**
LOY3				0.816**	0.821**	0.829**
LOY4				0.714**	0.721**	0.735**
LOY5				0.845**	0.833**	0.848**
LOY6				0.854**	0.812**	0.846**
LOY7				0.851**	0.823**	0.845**

** Correlation is significant at the 0.01 level (2-tailed).

From Table 6.5, the item-total correlation between each component and its own items of SERVTRUST, and antecedent and consequent variables had medium-high correlation values (0.4 – 0.9). This indicated that the items represent the latent variables. Further, Cronbach's alpha of each construct was between 0.7 – 0.9, while overall Cronbach's alpha was greater than 0.9. Because of the medium-high item total correlation and acceptable Cronbach's alpha (Churchill, 1979; Hair et al., 2006a), all of the variables were kept for use in the exploratory factor analysis stage.

In exploratory factor analysis, the principal factor procedure (principal axis factoring), was adopted to examine the component structure, using the varimax rotation. Because of the large sample size of 400, the items with factor loadings of less than 0.30 were all eliminated as prescribed by (Hair et al., 2006a). For the cross-loading items, Fisher's Z statistic was applied to test differences between correlations. The items would be eliminated if Fisher's Z test indicated that the differences between correlations were insignificant. The results of exploratory factor analysis and the evaluation of reliability are shown in the following sections.

The analyses were divided into three parts because trust was identified as a context specific construct (Ellen and Mark, 1999; Atuahene-Gima and Li, 2002). The first two parts represent the analysis of the SERVTRUST scale for each service industry; specifically health care and banking services. For a generalized scale, the

third part represents the analysis of the SERVTRUST for both sectors by using the average scores of each item.

EFA of SERVTRUST for Health Care Service Providers

In this section, exploratory factor analysis was used to determine the factor structure of constructs applied to the health care service industry only. The analyses were divided into three parts: EFA of SERVTRUST; EFA of antecedent constructs; and EFA of consequent constructs.

EFA of SERVTRUST for Health Care Service Providers

The proposed 13 dimensions of the SERVTRUST scale for health care service providers were factored using principal axis factoring with varimax rotation and unspecific number of factors. The results are shown in Table 6.6, and Table 6.7. Item-total correlation and Cronbach's alpha of each dimension of the SERVTRUST scale for health care service providers are presented.

Table 6.6

EFA of SERVTRUST for Health Care Service Providers

Factor and item	**Factor loading**	**Extracted Communality**	**Eigenvalues % of variance**
Expertise			35.318
DCRE4	0.689	0.686	
DCRE5	0.699	0.668	
DEXP1	0.608	0.485	
DEXP2	0.467	0.433	
DEXP5	0.597	0.638	
DEXT1	0.606	0.563	
DEXT2	0.604	0.657	
DEXT3	0.597	0.675	
DEXT4	0.560	0.635	

Table 6.6 (Continued)

Factor and item	Factor loading	Extracted Communality	Eigenvalues % of variance
Timeliness			6.246
DINF3	0.665	0.622	
DINF4	0.636	0.602	
DINF6	0.631	0.611	
DREL4	0.767	0.689	
DTIM1	0.609	0.541	
DTIM4	0.796	0.767	
Benevolence			3.586
DBEN1	0.686	0.723	
DBEN2	0.711	0.683	
DBEN3	0.670	0.723	
DBEN4	0.566	0.633	
DBEN5	0.597	0.520	
DBEN6	0.659	0.634	
DBEN7	0.543	0.638	
DBEN8	0.579	0.640	
Power			3.050
DPOW2	0.444	0.538	
DPOW3	0.490	0.549	
DPOW4	0.585	0.526	
DPOW5	0.735	0.703	
DPOW6	0.542	0.554	
Integrity			2.784
DINT1	0.610	0.646	
DINT2	0.575	0.683	
DINT3	0.756	0.840	
DINT4	0.647	0.744	
Confidentiality			2.495
DCOF1	0.580	0.419	
DCOF2	0.532	0.421	
DCOF5	0.476	0.366	
DCOT1	0.480	0.415	
DCOT5	0.541	0.435	
DINT5	0.367	0.408	

Table 6.6 (Continued)

Factor and item	Factor loading	Extracted Communality	Eigenvalues % of variance
Signal			2.181
DSIG1	0.653	0.731	
DSIG2	0.604	0.677	
DSIG3	0.386	0.526	
DSIG4	0.339	0.625	
Reliability			1.961
DREL2	0.524	0.616	
DREL3	0.437	0.573	
DTIM2	0.520	0.558	
Friendship			1.841
DFRI3	0.606	0.589	
DFRI4	0.617	0.557	
DFRI6	0.638	0.615	
Experience			1.703
DEXP3	0.557	0.650	
DEXP4	0.494	0.587	
DEXT6	0.366	0.592	
DFRI1	0.306	0.530	
Privacy			1.608
DCOF3	0.567	0.612	
DCOF4	0.681	0.700	
Information sharing			1.564
DINF1	0.509	0.619	
DINF2	0.489	0.622	
DINF5	0.374	0.442	
Image			1.488
DSIG5	0.624	0.632	
DSIG6	0.641	0.613	
Credibility			1.399
DCOT3	0.513	0.666	
DCOT4	0.313	0.477	
DCRE1	0.346	0.709	
DCRE2	0.435	0.698	
DCRE3	0.308	0.578	

* Kaiser-Mayer-Olkin Measure of Sampling adequacy = 0.946
* Total variance extracted by the 14 factors = 67.224%

Table 6.7

Item-total Correlation and Alpha Coefficient of SERVTRUST for Health Care Service Providers.

Component	Alpha coefficient	Item-total correlation
Expertise	0.911	0.847
Timeliness	0.875	0.672
Benevolence	0.916	0.823
Power	0.838	0.736
Integrity	0.900	0.566
Confidentiality	0.713	0.471
Signal	0.849	0.779
Reliability	0.773	0.743
Friendship	0.740	0.561
Experience	0.782	0.764
Information sharing	0.732	0.692
Credibility	0.832	0.770
Total	0.882	

*Privacy and Image were not included because they did not meet the 3 items per construct requirement for EFA (Hair et al., 2006a).

From Table 6.6 and 6.7, the final SERVTRUST scale for health care service providers consisted of 59 items in 12 dimensions, which are labeled and defined as follows:

- Benevolence: The behavior of a service provider which reflects understanding, caring, sacrifice, and respect toward customers.
- Confidentiality: The privacy of personal information.
- Credibility: The reliability of a service provider's promises and guarantees.
- Experience: The level of consumer experience with the service provider.
- Expertise: The consumers' perception of a service provider's knowledge, authority, and ability to serve their needs.
- Friendship: The level of friendliness of service providers.
- Information sharing: The capability of the service provider to provide necessary information.

- Integrity: The level of the service provider's honesty, ethics and service standard.
- Power: The belief in the service provider's recommendations.
- Reliability: The service provider's ability to do things as promised.
- Signal: The degree of service provider's reputation in the market.
- Timeliness: The ability of the service provider to respond to consumers' needs in a timely fashion.

For each dimension and also overall, Cronbach's alpha was higher than 0.70. Item-total correlation of each component had total scores between 0.471-0.847. This means that the components contained medium-high correlation with the total scores. Taken together, the acceptable reliability and correlation of the constructs lead to the preliminary conclusion about the existence of high construct validity (Hair et al., 2006a).

EFA of SERVTRUST's Antecedents for Health Care Service Providers

In this section, antecedent constructs of SERVTRUST for health care service providers were factored in the same procedure as the SERVTRUST scale in the previous section. However, in this case, each proposed construct was analyzed separately one-by-one; refer Table 6.8. The main purpose of this analysis was to test whether each construct contained one factor as suggested in the literature.

Table 6.8

EFA of Antecedents of SERVTRUST for Health Care Service Providers

Construct and items	**No. Factor extracted/ KMO**	**Factor loading**	**Extracted Communality**	**Eigenvalues % of variance**	**Cronbach's alpha**
Communication	1/ 0.830			66.528	0.871
DCOM1		0.725	0.526		
DCOM2		0.798	0.636		
DCOM3		0.789	0.623		
DCOM4		0.738	0.545		
DCOM5		0.762	0.581		
Problem solving	1/ 0.815			59.963	0.828
DPBS1		0.616	0.379		
DPBS2		0.765	0.586		
DPBS3		0.651	0.424		
DPBS4		0.762	0.580		
DPBS5		0.737	0.543		
Quality of service	1/ 0.768			50.684	0.789
DQUA1		0.633	0.401		
DQUA2		0.604	0.365		
DQUA3		0.676	0.457		
DQUA4		0.561	0.315		
DQUA5		0.723	0.522		
DQUA6		0.633	0.400		
Satisfaction	1/ 0.862			76.164	0.921
DSAT1		0.785	0.616		
DSAT2		0.845	0.714		
DSAT3		0.837	0.701		
DSAT4		0.849	0.720		
DSAT5		0.873	0.762		

From Table 6.8, each antecedent construct was considered a one-factor construct because all proposed items were factored into the proposed constructs with acceptable KMO, factor loadings, communalities, eigenvalues, and Cronbach's alphas.

EFA of SERVTRUST's Consequences for Health Care Service

Again, consequent constructs of SERVTRUST for health care service providers were factored in the same manner as the antecedent constructs; refer Table 6.9.

Table 6.9

EFA of Consequences of SERVTRUST for Health Care Service Providers

Construct and items	No. Factor extracted/ KMO	Factor loading	Extracted Communality	Eigenvalues % of variance	Cronbach's alpha
Commitment	1/ 0.851			76.937	0.925
DCMM1		0.752	0.566		
DCMM2		0.841	0.708		
DCMM3		0.903	0.816		
DCMM4		0.871	0.759		
DCMM5		0.848	0.719		
Loyalty	1/ 0.883			66.238	0.913
DLOY1		0.718	0.516		
DLOY2		0.818	0.669		
DLOY3		0.791	0.626		
DLOY4		0.634	0.402		
DLOY5		0.826	0.683		
DLOY6		0.827	0.684		
DLOY7		0.825	0.680		

Table 6.9 showed that each consequent construct was also one-factor construct because all proposed items were factored into the proposed constructs with acceptable KMO, factor loadings, communalities, eigenvalues, and Cronbach's alphas.

EFA of SERVTRUST for Banking Service Providers

In this section, exploratory factor analysis was used to determine the factor structure of constructs applied to the banking service industry only. The

analyses were divided into three parts: EFA of SERVTRUST; EFA of antecedent constructs; and EFA of consequent constructs.

EFA of SERVTRUST for Banking Service Providers

As well as the EFA of SERVTRUST for health care service providers, the proposed 13 dimensions of the SERVTRUST scale for banking service providers were factored using principal axis factoring with varimax rotation. The results are shown in Table 6.10, and Table 6.11. Item-total correlation and Cronbach's alpha of each dimension of the SERVTRUST scale for banking service providers are presented.

Table 6.10

EFA of SERVTRUST for Banking Service Providers

Factor and item	**Factor loading**	**Extracted Communality**	**Eigenvalues % of variance**
Benevolence			37.210
BBEN1	0.716	0.720	
BBEN2	0.740	0.708	
BBEN3	0.668	0.658	
BBEN4	0.697	0.710	
BBEN5	0.589	0.441	
BBEN6	0.645	0.611	
BBEN7	0.689	0.676	
BBEN8	0.703	0.692	
Timeliness			5.891
BINF3	0.621	0.638	
BINF4	0.590	0.579	
BREL4	0.683	0.660	
BTIM1	0.646	0.596	
BTIM2	0.399	0.596	
BTIM3	0.680	0.738	
BTIM4	0.801	0.768	
BTIM5	0.624	0.670	

Table 6.10 (Continued)

Factor and item	Factor loading	Extracted Communality	Eigenvalues % of variance
Integrity			4.003
BINT1	0.554	0.611	
BINT2	0.661	0.706	
BINT3	0.810	0.848	
BINT4	0.793	0.841	
Experience			3.287
BEXP3	0.706	0.619	
BEXP4	0.534	0.558	
BEXT5	0.521	0.663	
BEXT6	0.455	0.594	
BFRI1	0.504	0.509	
Credibility			2.951
BCRE1	0.602	0.705	
BCRE2	0.572	0.676	
BCRE3	0.432	0.452	
Confidentiality			2.400
BCOF1	0.727	0.590	
BCOF2	0.666	0.527	
BCOF5	0.561	0.404	
BCOT1	0.573	0.486	
BCOT5	0.376	0.418	
BEXP2	0.340	0.461	
BINT5	0.348	0.339	
Power			2.306
BPOW2	0.554	0.561	
BPOW3	0.500	0.515	
BPOW4	0.608	0.561	
BPOW5	0.643	0.676	
BPOW6	0.586	0.617	

Table 6.10 (Continued)

Factor and item	Factor loading	Extracted Communality	Eigenvalues % of variance
Reputation			1.916
BREL5	0.507	0.579	
BREL6	0.501	0.696	
BSIG1	0.641	0.668	
BSIG2	0.710	0.790	
Friendship			1.728
BFRI3	0.479	0.512	
BFRI4	0.620	0.598	
BFRI6	0.590	0.534	
Information sharing			1.640
BINF1	0.661	0.588	
BINF2	0.456	0.559	
BINF5	0.361	0.461	
Signal			1.561
BSIG5	0.535	0.475	
BSIG6	0.513	0.439	
BSIG7	0.509	0.532	
Expertise			1.437
BEXT1	0.343	0.660	
BEXT2	0.472	0.720	
BEXT3	0.462	0.764	
BEXT4	0.378	0.689	
Reliability			1.339
BREL1	0.409	0.688	
BREL2	0.389	0.611	
BREL3	0.379	0.653	

* Kaiser-Mayer-Olkin Measure of Sampling adequacy = 0.956

*Total variance extracted by the 13 factors = 67.598%

Table 6.11

Item-total Correlation and Alpha Coefficient of SERVTRUST for Banking Service Providers

Component	Alpha coefficient	Item-total correlation
Benevolence	0.926	0.820
Timeliness	0.896	0.788
Integrity	0.906	0.735
Experience	0.830	0.796
Credibility	0.849	0.727
Confidentiality	0.778	0.587
Power	0.852	0.773
Reputation	0.864	0.754
Friendship	0.725	0.575
Information sharing	0.701	0.650
Expertise	0.901	0.812
Reliability	0.861	0.793
Total	0.894	

**Signal was not included because of its low reliability.

From Table 6.10 and 6.11, the SERVTRUST scale for banking service providers consisted of 57 items from 12 dimensions, which were labeled and defined as follows:

- Benevolence: The behaviors of a service provider which reflect the understanding, caring, sacrifice, and respect toward customers.
- Timeliness: The ability of a service provider to respond to consumers' needs in a timely fashion.
- Integrity: The level of service provider's honesty, ethics and service standard.
- Experience: The level of consumer experience with the service provider's services.
- Credibility: The reliability of a service provider's promises and guarantees.
- Confidentiality: The consumer's belief that a service provider will guarantee privacy of personal information.

- Power: The consumer's belief in a service provider's recommendations.
- Reputation: The level of service provider's reputation in providing a good and reliable service.
- Friendship: The level of friendliness of a service provider.
- Information sharing: The capability of a service provider to provide necessary information.
- Signal: The degree of investment in facilities and marketing activities.
- Expertise: The consumers' perception of a service provider's knowledge, authority, and ability to serve their needs.
- Reliability: The service provider's ability to do something as promised.

Each dimension had Cronbach's alphas and overall reliability coefficients higher than 0.70. Item-total correlation of each component had the total scores between 0.575-0.820. This means that the components had medium-high correlation with the total score. Taken together, the acceptable reliability and correlation of the constructs led to the preliminary conclusion about the existence of construct validity (Hair et al., 2006a).

EFA of SERVTRUST's Antecedents for Banking Service Providers

In this section, antecedent constructs of SERVTRUST for banking service providers were factored in the same way as in the previous section. However, each proposed construct was analyzed separately one-by-one basis to see if there was a one-factor feature in the group of variables; refer Table 6.12.

Table 6.12

EFA of Antecedents of SERVTRUST for Banking Service Providers

Construct and items	**No. Factor extracted/ KMO**	**Factor loading**	**Extracted Communality**	**Eigenvalues % of variance**	**Cronbach's alpha**
Communication	1/ 0.871			68.554	0.882
BCOM1		0.731	0.534		
BCOM2		0.853	0.728		
BCOM3		0.812	0.659		
BCOM4		0.692	0.479		
BCOM5		0.805	0.647		
Problem solving	1/ 0.840			64.918	0.860
BPBS1		0.555	0.308		
BPBS2		0.802	0.643		
BPBS3		0.759	0.575		
BPBS4		0.820	0.672		
BPBS5		0.802	0.643		
Quality of service	1/ 0.772			54.361	0.821
BQUA1		0.620	0.385		
BQUA2		0.651	0.424		
BQUA3		0.696	0.483		
BQUA4		0.575	0.330		
BQUA5		0.750	0.562		
BQUA6		0.739	0.545		
Satisfaction	1/ 0.869			75.490	0.918
BSAT1		0.788	0.621		
BSAT2		0.820	0.672		
BSAT3		0.859	0.738		
BSAT4		0.852	0.727		
BSAT5		0.844	0.712		

From Table 6.12, each antecedent construct was one-factor construct because all proposed items were factored into the proposed constructs with acceptable KMO, factor loadings, communalities, eigenvalues, and Cronbach's alphas.

EFA of SERVTRUST's Consequences for Banking Service

Again, consequent constructs of SERVTRUST for banking service providers were factored in the same manner as the antecedent constructs, in order to test for one-factor construct; refer Table 6.13.

Table 6.13

EFA of Consequences of SERVTRUST for Banking Service Providers

Construct and items	No. Factor extracted/ KMO	Factor loading	Extracted Communality	Eigenvalues % of variance	Cronbach's alpha
Commitment	1/ 0.860			78.987	0.933
BCMM1		0.772	0.595		
BCMM2		0.866	0.750		
BCMM3		0.902	0.813		
BCMM4		0.878	0.771		
BCMM5		0.874	0.764		
Loyalty	1/ 0.888			64.506	0.907
BLOY1		0.735	0.540		
BLOY2		0.802	0.643		
BLOY3		0.799	0.639		
BLOY4		0.653	0.427		
BLOY5		0.814	0.662		
BLOY6		0.768	0.589		
BLOY7		0.781	0.611		

From Table 6.13, each consequent construct was one-factor construct because all proposed items were factored into the proposed constructs with acceptable KMO, factor loadings, communalities, eigenvalues, and Cronbach's alphas.

EFA of SERVTRUST for Average Scale

In this section, exploratory factor analysis was used to determine the factor structure of constructs applied to for average scale only. The analyses were

divided into three parts: EFA of SERVTRUST; EFA of antecedent constructs; and EFA of consequent constructs.

EFA of SERVTRUST for Average Scale

Finally, the EFA of the proposed 13 dimensions of SERVTRUST for average scale were factored using principal axis factoring with varimax rotation. The results are shown in Table 6.14, and Table 6.15 which are presented with item-total correlation and Cronbach's alpha for each dimension of the SERVTRUST scale on average; refer Table 6.14.

Table 6.14

EFA of SERVTRUST for Average Scale

Factor and item	**Factor loading**	**Extracted Communality**	**Eigenvalues % of variance**
Timeliness			38.191
AFRI5	0.495	0.644	
AINF3	0.641	0.558	
AINF4	0.642	0.576	
AINF6	0.671	0.622	
AREL4	0.770	0.712	
ATIM1	0.687	0.606	
ATIM3	0.664	0.680	
ATIM4	0.835	0.787	
ATIM5	0.647	0.677	
Benevolence			6.392
ABEN1	0.732	0.741	
ABEN2	0.757	0.730	
ABEN3	0.639	0.693	
ABEN4	0.631	0.675	
ABEN5	0.561	0.454	
ABEN6	0.636	0.631	
ABEN7	0.648	0.665	
ABEN8	0.670	0.675	

Table 6.14 (Continued)

Factor and item	Factor loading	Extracted Communality	Eigenvalues % of variance
Expertise			3.545
AEXP3	0.727	0.661	
AEXP4	0.531	0.550	
AEXP5	0.586	0.689	
AEXT3	0.593	0.743	
AEXT5	0.597	0.677	
AEXT6	0.545	0.599	
APOW1	0.350	0.547	
Reliable signal			3.395
AREL3	0.407	0.632	
AREL5	0.577	0.588	
AREL6	0.525	0.696	
ASIG1	0.638	0.711	
ASIG2	0.675	0.734	
ASIG7	0.398	0.408	
ATIM2	0.324	0.603	
Integrity			2.870
AINT1	0.568	0.648	
AINT2	0.668	0.751	
AINT3	0.767	0.855	
AINT4	0.719	0.807	
Confidentiality			2.513
ACOF1	0.715	0.602	
ACOF2	0.623	0.469	
ACOF5	0.530	0.393	
ACOT1	0.533	0.444	
ACOT5	0.482	0.454	
Power			2.156
APOW2	0.493	0.590	
APOW3	0.487	0.566	
APOW4	0.546	0.527	
APOW5	0.670	0.694	
APOW6	0.584	0.611	

Table 6.14 (Continued)

Factor and item	Factor loading	Extracted Communality	Eigenvalues % of variance
Credibility			1.819
ACRE1	0.558	0.715	
ACRE2	0515	0.650	
ACRE3	0.526	0.488	
ACRE4	0.532	0.716	
ACRE5	0.395	0.630	
Friendship			1.713
AFRI3	0.597	0.578	
AFRI4	0.637	0.641	
AFRI6	0.613	0.603	
Information sharing			1.645
AINF1	0.624	0.662	
AINF2	0.462	0.615	
AINF5	0.398	0.466	
AREL2	0.321	0.601	
Privacy			1.571
ACOF3	0.464	0.594	
ACOF4	0.607	0.693	
ACOT3	0.333	0.703	
Image			1.479
ASIG5	0.384	0.500	
ASIG6	0.488	0.547	
***			1.371

* Kaiser-Mayer-Olkin Measure of Sampling adequacy = 0.954, Total variance extracted by the 13 factors = 68.657%

***The 13rd factor did not have any item after rotation.

Table 6.15

Item-total Correlation and Alpha Coefficient of SERVTRUST for Average Scale

Component	Alpha coefficient	Item-total correlation
Timeliness	0.916	0.779
Benevolence	0.924	0.828
Expertise	0.895	0.835
Reliable signal	0.885	0.840
Integrity	0.917	0.744
Confidentiality	0.756	0.459
Power	0.854	0.776
Credibility	0.878	0.786
Friendship	0.763	0.579
Information sharing	0.767	0.760
Privacy	0.782	0.692
Total	0.886	

*Image was not included because it did not meet the 3 items per construct requirement for EFA and low alpha.

From Tables 6.14 and 6.15, the average SERVTRUST scale consisted of 60 items from 11 dimensions, which were labeled and defined as follows:

- Timeliness: The ability of a service provider to respond to consumers' needs in a timely and friendly fashion.
- Benevolence: The behaviors of a service provider which reflects the understanding, caring, sacrifice, and respect toward customers.
- Expertise: The consumers' perception of a service provider's knowledge, authority, and ability to serve their needs based on their experiences.
- Reliability signal: The reputation of a service provider's ability to do something as promised.
- Integrity: The level of a service provider's honesty, ethics and service standard.
- Confidentiality: The consumer's belief that a service provider will guarantee privacy of personal information.
- Power: The belief in a service provider's recommendations.

- Credibility: The reliability of a service provider's promises and guarantees.
- Friendship: The level of friendliness of a service provider.
- Information sharing: The capability of a service provider to provide necessary information.
- Privacy: The belief in a service provider's ability to keep information confidential.

Each dimension had a Cronbach's alpha and total reliability higher than 0.70. Item-total correlation of each component with the total score is between 0.459-0.840. This meant that the components had medium-high correlation with the total score. Taken together, the acceptable reliability and correlation of the constructs led to the preliminary conclusion about the existence of construct validity (Hair et al., 2006a).

EFA of SERVTRUST's Antecedents for Average Scale

Antecedent constructs of average SERVTRUST were then factored in the same procedure as in the previous sections. However, each proposed construct was analyzed separately one-by-one because the main purpose of this analysis was to test for the characteristic of the construct, as reviewed in the literature; refer Table 6.16.

Table 6.16

EFA of Antecedents of SERVTRUST for Average Scale

Construct and items	**No. Factor extracted/ KMO**	**Factor loading**	**Extracted Communality**	**Eigenvalues % of variance**	**Cronbach's alpha**
Communication	1/ 0.864			71.213	0.896
ACOM1		0.759	0.576		
ACOM2		0.839	0.704		
ACOM3		0.836	0.699		
ACOM4		0.749	0.560		
ACOM5		0.817	0.668		

Table 6.16 (Continued)

Construct and items	No. Factor extracted/ KMO	Factor loading	Extracted Communality	Eigenvalues % of variance	Cronbach's alpha
Problem solving	1/ 0.851			65.738	0.865
APBS1		0.620	0.384		
APBS2		0.796	0.633		
APBS3		0.744	0.554		
APBS4		0.815	0.664		
APBS5		0.801	0.642		
Quality of service	1/ 0.794		0.435	56.218	0.825
AQUA1			0.436		
AQUA2			0.555		
AQUA3			0.320		
AQUA4			0.582		
AQUA5			0.537		
AQUA6					
Satisfaction	1/ 0.868			77.421	0.926
ASAT1		0.804	0.646		
ASAT2		0.856	0.733		
ASAT3		0.858	0.736		
ASAT4		0.861	0.741		
ASAT5		0.857	0.734		

From Table 6.16, each antecedent construct is one-factor construct because all proposed items were factored into the only one factor for each construct with acceptable KMO, factor loadings, communalities, eigenvalues, and Cronbach's alphas.

EFA of SERVTRUST's Consequences for Average Scale

Consequent constructs of SERVTRUST for average scale were factored the same way as the antecedent constructs. Again, the purpose was to test for the characteristic of the construct, as reviewed in the literature; refer Table 6.17.

Table 6.17

EFA of Consequences of SERVTRUST for Average Scale

Construct and items	No. Factor extracted/ KMO	Factor loading	Extracted Communality	Eigenvalues % of variance	Cronbach's alpha
Commitment	1/ 0.856			78.832	0.933
ACMM1		0.763	0.583		
ACMM2		0.860	0.740		
ACMM3		0.901	0.812		
ACMM4		0.881	0.777		
ACMM5		0.880	0.774		
Loyalty	1/ 0.884			66.682	0.915
ALOY1		0.723	0.523		
ALOY2		0.813	0.661		
ALOY3		0.808	0.652		
ALOY4		0.669	0.448		
ALOY5		0.831	0.691		
ALOY6		0.812	0.660		
ALOY7		0.810	0.656		

From Table 6.17, all consequent constructs were one-factor construct because all proposed items were factored into the proposed constructs with acceptable KMO, factor loadings, communalities, eigenvalues, and Cronbach's alphas.

Confirmatory Factor Analysis

After the Exploratory Factor Analysis or EFA of the SERVTRUST scale was completed, the Confirmatory Factor Analysis or CFA was employed into a scale development procedure to confirm the validity and reliability of the developed scale.

For CFA, the fit indices of the proposed scale were tested. The fit indices were based on the rule of thumbs suggested by Hair et al. (2006a). For generalization of the scale, it was suggested that the ratio of items to factor should be 3:1, or preferably 4:1. The items which had high standardized residuals, low factor loadings, and low squared multiple correlations were candidates for deletion. The goodness of

fit index should be 0.90 or higher, while the badness of fit index should not be over 0.08. They also suggest the criteria for determining construct validity (convergent validity, discriminant validity, and nomological validity) and construct reliability which will be presented later.

CFA of SERVTRUST Scale

SERVTRUST was treated as a context specific construct (Atuahene-Gima and Li 2002), so the CFA was separated into three sections: the SERVTRUST scale for health care service providers; the SERVTRUST scale for banking service providers; and lastly the SERVTRUST scale for the average of the two. The following sections are the final results of CFA for all sections of the SERVTRUST scales.

CFA of SERVTRUST Scale for Health Care Service Providers

From Table 6.18, the SERVTRUST scale for health care service providers consisted of five dimensions: expertise; timeliness; benevolence; integrity; and credibility. Each had three items per factor, except benevolence, which had five items, with significance factor loadings higher than 0.70. The standardized residuals were not over 4.0, except between BEN6 and TIM1 which was 4.03. Although it was over the suggested critical value, other indices were acceptable. In contrast, if one of these two items was deleted, other indices would fall to an unacceptable level. The above standardized residuals could therefore be considered an acceptable outcome. The results for assessing the scale's reliability and validity will be presented in other sections.

Table 6.18

CFA of SERVTRUST Scale for Health Care Service Providers

Item/ Factor	EXT	TIM	BEN	INT	CRE
EXT1	0.78 (18.06)**				
EXT2	0.89 (21.70)**				
EXT3	0.82 (19.21)**				
REL4		0.85 (19.56)**			
TIM1		0.72 (15.76)**			
TIM4		0.88 (20.54)**			
BEN1			0.83 (19.60)**		
BEN3			0.81 (19.00)**		
BEN4			0.79 (18.39)**		
BEN6			0.72 (16.00)**		
BEN7			0.76 (17.24)**		
INT1				0.77 (17.54)**	
INT3				0.92 (23.29)**	
INT4				0.85 (20.58)**	

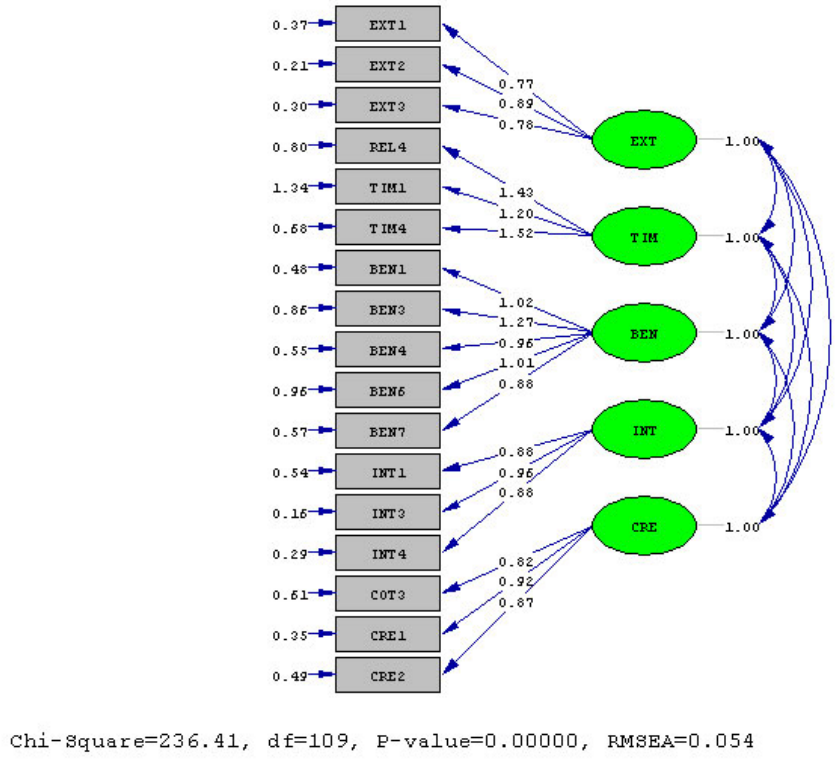
Table 6.18 (Continued)

Item/ Factor	EXT	TIM	BEN	INT	CRE
COT3					0.72 (15.88)**
CRE1					0.84 (19.60)**
CRE2					0.78 (17.55)**
VE	0.69	0.67	0.61	0.72	0.61
CR	0.87	0.86	0.89	0.89	0.82
Other indices	λ^2 = 236.41, df = 109, λ^2/df = 2.17, P-value = 0.00, RMSEA = 0.054 NFI = 0.98, CFI = 0.99, SRMR = 0.041, GFI = 0.93, AGFI = 0.91				

** t-value significance at 0.01

Figure 6.1

CFA Model of SERVTRUST for Health Care Service Providers with Estimated Values



CFA of SERVTRUST's Antecedent and Consequent Constructs for Health Care Service Providers

The results of confirmatory factor analysis of SERVTRUST's antecedents for heath care service providers are presented in Table 6.19. Overall, the fit indices indicated that all constructs fitted the data well. However, some constructs showed that they were a saturated model with a perfect fit because chi-square and degree of freedom equal zero(Widaman and Thompson, 2003). Although, they were the least restricted and practically useless model (Bentler, 1990; Molenaar, Washington, and Diekmann, 2000), they nevertheless represented the best case model (Molenaar et al., 2000). Cudeck and Browne (1983) indicated that a saturated model maybe expected to yield the best cross validation indices. However, if the constructs contained more than three items, RMSEA would fall into an unacceptable range which was in contrast with the other fit indices (the four items per construct is not presented here). So, three items per construct was more preferable in this case (Jirawat, 2003).

CFA of SERVTRUST Scale for Banking Service Providers

The SERVTRUST for banking service providers consisted of five dimensions: benevolence; timeliness; integrity; credibility; and reputation. Each dimension contained three to six items with significance factor loading greater than 0.70, except for INF3 and CRE3, which had a significant factor loading of 0.61 and 0.68 respectively, as shown in Table 6.20. However, they were retained because other evidence showed that there were no problems. Furthermore, the standardized residual was not over 4.0. Therefore, this could be considered the best solution. For the assessment of the scale's reliability and validity, they will be presented later in the relevant sections.

Table 6.19

Confirmatory Factor Analysis of Antecedents and Consequences of SERVTRUST Scale for Health Care Service Providers

Construct	Factor loading	V.E.	CR.	χ^2	P-value	DF	χ^2/DF	RMSEA	NFI	CFI	SRMR	GFI	AGFI	Result
Communication		0.64	0.84	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
COM1	0.83**													
COM2	0.76**													
COM3	0.80**													
Problem Solving		0.57	0.79	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
PBS2	0.71**													
PBS4	0.73**													
PBS5	0.81**													
Service Quality		0.52	0.76	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
QUA4	0.55**													
QUA5	0.90**													
QUA6	0.68**													
Satisfaction		0.71	0.90	5.53	0.063	2	2.77	0.067	1.00	1.00	0.011	0.99	0.97	Passed
SAT1	0.72**													
SAT3	0.85**													
SAT4	0.89**													
SAT5	0.88**													
Commitment		0.80	0.92	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
CMM3	0.86**													
CMM4	0.93**													
CMM5	0.89**													
Loyalty		0.57	0.84	5.55	0.062	2	2.78	0.067	0.99	1.00	0.019	0.99	0.97	Passed
LOY1	0.74**													
LOY4	0.59**													
LOY5	0.91**													
LOY7	0.76**													

**t-value significance level at 0.01

Table 6.20

CFA of SERVTRUST Scale for Banking Service Providers

Item/ Factor	BEN	TIM	INT	CRE	REP
BEN1	0.81 (19.38)**				
BEN3	0.77 (17.86)**				
BEN4	0.80 (18.95)**				
BEN6	0.75 (17.25)**				
BEN7	0.83 (20.01)**				
BEN8	0.84 (20.19)**				
INF3		0.61 (12.89)**			
INF4		0.72 (15.98)**			
REL4		0.80 (18.47)**			
TIM1		0.76 (17.11)**			
TIM4		0.85 (20.21)**			
INT1			0.78 (17.97)**		
INT2			0.84 (19.84)**		
INT3			0.87 (20.88)**		
CRE1				0.88 (21.46)**	
CRE2				0.86 (20.79)**	
CRE3				0.68 (14.81)**	

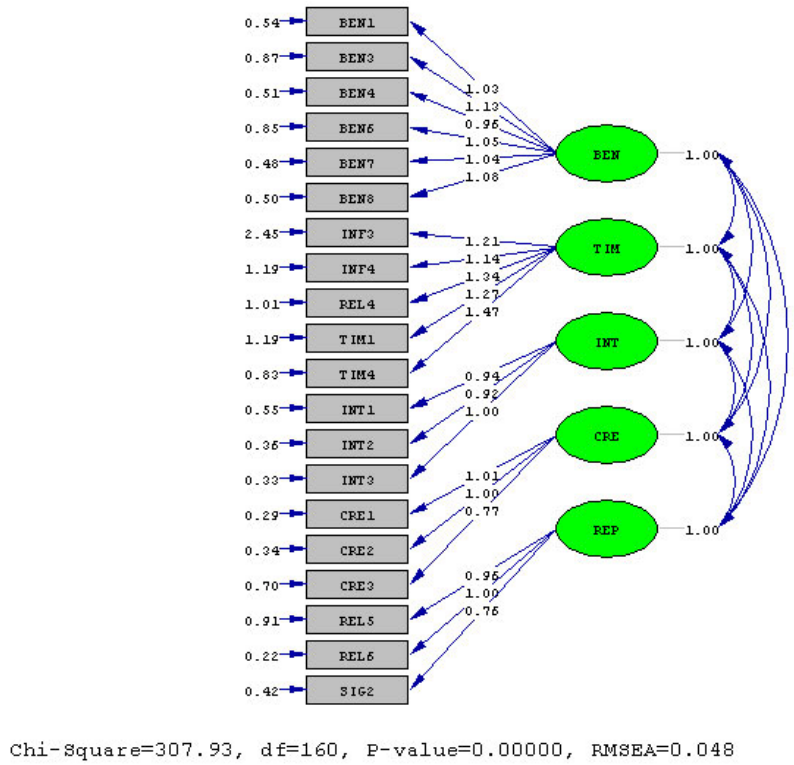
Table 6.20 (Continued)

Item/ Factor	BEN	TIM	INT	CRE	REP
REL5					0.71 (22.09)**
REL6					0.90 (22.09)**
SIG2					0.76 (17.12)**
VE	0.64	0.57	0.69	0.66	0.63
CR	0.91	0.87	0.87	0.85	0.84
Other indices	λ^2 = 307.97, df = 160, λ^2/df = 1.92, P-value = 0.00, RMSEA = 0.048 NFI = 0.98, CFI = 0.99, SRMR = 0.040, GFI = 0.93, AGFI = 0.91				

** t-value significance level at 0.01

Figure 6.2

CFA Model of SERVTRUST for Banking Service Providers with Estimated Values



CFA of SERVTRUST's Antecedent and Consequent Constructs for Banking Service Providers

The results of confirmatory factor analysis of SERVTRUST's antecedents and consequences for banking service providers are presented in Table 6.21. Overall, the fit indices indicated that all of the constructs fitted the data well. However, some constructs showed that they were a saturated model with perfect fit because chi-square and degree of freedom equal zero(Widaman and Thompson, 2003). Although, they were the least restricted and practically useless model (Bentler, 1990; Molenaar et al., 2000) they represented the best case model (Molenaar et al., 2000). Cudeck and Browne (1983) indicated that a saturated model maybe expected to yield the best cross validation indices. However, if the constructs contained more than three items RMSEA would fall into the unacceptable value that contrasted with other fit indices (the four items per construct was not presented here). Again, it was more preferable to include three items per construct in this case (Jirawat, 2003).

CFA of SERVTRUST for Average Scale

The SERVTRUST scale consisted of five dimensions: timeliness; benevolence; expertise; integrity; and power. Each contained three to five items per factor with significance factor loading higher than 0.70, as shown in Table 6.22. The standardized residual was below 4.0 as the rule of thumb. This was therefore considered an acceptable solution. The assessment of the scale's reliability and validity are presented in other sections.

Table 6.21

Confirmatory Factor Analysis of Antecedents and Consequences of SERVTRUST Scale for Banking Service Providers

Construct	Factor loading	V.E.	CR.	χ^2	P-value	DF	χ^2/DF	RMSEA	NFI	CFI	SRMR	GFI	AGFI	Result
Communication		0.65	0.88	2.43	0.30	2	1.22	0.023	1.00	1.00	0.009	1.00	0.98	Passed
COM1	0.75**													
COM2	0.87**													
COM3	0.82**													
COM5	0.77**													
Problem Solving		0.64	0.87	1.38	0.50	2	0.69	0.000	1.00	1.00	0.007	1.00	0.99	Passed
PBS2	0.76**													
PBS3	0.77**													
PBS4	0.85**													
PBS5	0.79**													
Service Quality		0.58	0.79	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
QUA3	0.58**													
QUA5	0.83**													
QUA6	0.84**													
Satisfaction		0.76	0.91	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
SAT3	0.85**													
SAT4	0.89**													
SAT5	0.88**													
Commitment		0.82	0.93	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
CMM3	0.89**													
CMM4	0.94**													
CMM5	0.88**													
Loyalty		0.62	0.83	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
LOY1	0.81**													
LOY3	0.76**													
LOY5	0.80**													

**t-value significance level at 0.01

Table 6.22

CFA of SERVTRUST for Average Scale

Item/ Factor	TIM	BEN	EXT	INT	POW
INF4	0.72 (15.64)**				
TIM3	0.82 (18.84)**				
TIM5	0.84 (19.51)**				
BEN1		0.82 (19.55)**			
BEN3		0.79 (18.27)**			
BEN4		0.81 (19.03)**			
BEN6		0.76 (17.38)**			
BEN8		0.80 (18.72)**			
EXT3			0.81 (18.74)**		
EXT5			0.82 (19.11)**		
EXT6			0.76 (16.92)**		
INT1				0.77 (18.11)**	
INT2				0.85 (20.71)**	
INT3				0.94 (24.60)**	
INT4				0.89 (22.32)**	

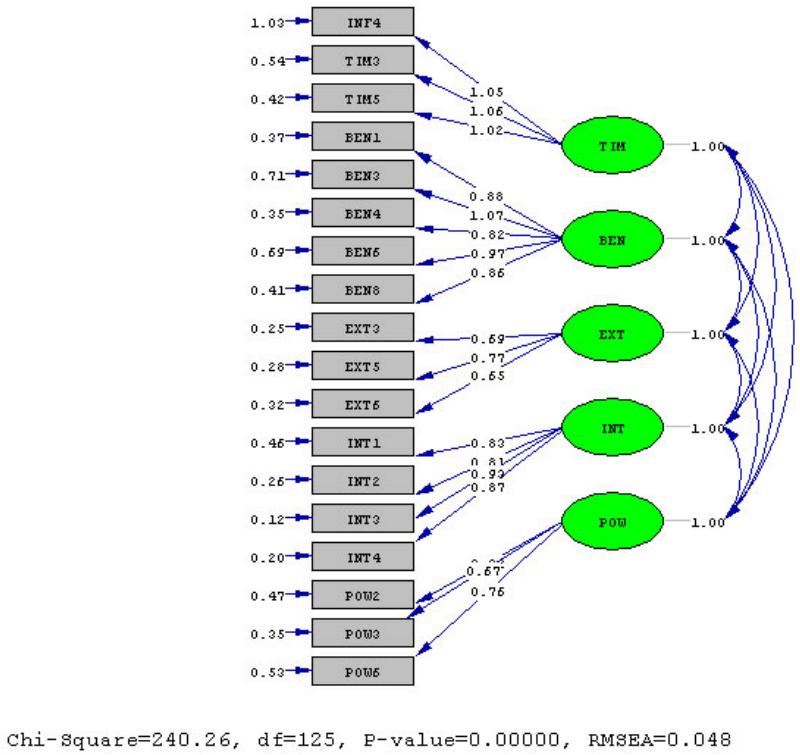
Table 6.22 (Continued)

Item/ Factor	TIM	BEN	EXT	INT	POW
POW2					0.77 (16.79)**
POW3					0.75 (16.25)**
POW6					0.72 (15.45)**
VE	0.64	0.63	0.64	0.75	0.56
CR	0.84	0.89	0.84	0.92	0.79
Other indices	λ^2 = 240.26, df = 125, λ^2/df = 1.92, P-value = 0.00, RMSEA = 0.048 NFI = 0.98, CFI = 0.99, SRMR = 0.034, GFI = 0.94, AGFI = 0.91				

** t-value significance level at 0.01

Figure 6.3

CFA Model of SERVTRUST for Average Scale with Estimated Values



CFA of SERVTRUST's Antecedent and Consequent Constructs for Average Scale

In Table 6.23, the results of confirmatory factor analysis of SERVTRUST's antecedents and consequences for average scale are presented. Overall, the fit indices indicated that all of constructs fitted the data well. However, some constructs showed that they were a saturated model with a perfect fit because chi-square and degree of freedom equal zero(Widaman and Thompson, 2003). Although they were the least restricted and practically useless model (Bentler, 1990; Molenaar et al., 2000) they nevertheless represented the best case model (Molenaar et al., 2000). Cudeck and Browne (1983) indicated that a saturated model may be expected to yield the best cross validation indices. However, if the constructs hold more than three items RMSEA would fall to an unacceptable value that contrasts with the other fit indices (the four items per construct is not presented here). Three items per construct was therefore more preferable in this case (Jirawat, 2003), the same as in the previous analyses.

Table 6.23

Confirmatory Factor Analysis of Antecedents and Consequences of SERVTRUST for Average Scale

Construct	Factor loading	V.E.	CR.	χ^2	P-value	DF	χ^2/DF	RMSEA	NFI	CFI	SRMR	GFI	AGFI	Result
Communication		0.68	0.87	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
COM1	0.82**													
COM2	0.81**													
COM3	0.85**													
Problem Solving		0.63	0.87	3.51	0.17	2	1.76	0.044	1.00	1.00	0.011	1.00	0.98	Passed
PBS2	0.75**													
PBS3	0.77**													
PBS4	0.85**													
PBS5	0.80**													
Service Quality		0.59	0.81	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
QUA3	0.61**													
QUA5	0.87**													
QUA6	0.80**													
Satisfaction		0.77	0.91	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
SAT3	0.86**													
SAT4	0.90**													
SAT5	0.87**													
Commitment		0.83	0.93	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
CMM3	0.88**													
CMM4	0.94**													
CMM5	0.90**													
Loyalty		0.66	0.85	0.00	1.00	0.00	-	The model fit is saturated. The fit is perfect.						Passed
LOY1	0.73**													
LOY5	0.93**													
LOY6	0.76**													

**t-value significant level at 0.01

Assessment of Scale's Reliability

After EFA and CFA were analyzed, the consistency and reliability of the developed scale needed to be shown. In this study, two reliability indicators were tested. Firstly, coefficient alpha or Cronbach's alpha (Cronbach, 1951) were calculated together with item-total correlation. According to the rule of thumb, if Cronbach's alpha is greater than 0.70 and item-total correlation is higher than 0.40, this is acceptable (Nunnally, 1978; Robert and Barton, 1982; Hair et al., 2006a). Secondly, construct reliability was calculated before evaluating construct validity, which should be higher than 0.70 (Hair et al., 2006a). Hair et al. (2006a) also recommended the equation to calculate construct reliability. Table 6.24-6.26 presented the values of Cronbach's alpha, item-total correlation, and construct reliability of all constructs in this study.

The SERVTRUST Scale's Reliability, Its Antecedents and Consequences for Health Care Service Providers.

From Table 6.24, the values of item-total correlation, Cronbach's alpha, and construct reliability were higher than the suggested cutoff points. This indicated the existence of internal consistency, therefore indicating the reliability of the scales.

Table 6.24

Cronbach's Alpha, Construct Reliability, and Item-total Correlation of SERVTRUST and Its Antecedents and Consequences for Health Care Service Providers

Construct and items	Item-total correlation	Cronbach's alpha	CR
Expertise		0.869	0.87
EXT1	0.877**		
EXT2	0.911**		
EXT3	0.882**		
Timeliness		0.853	0.86
REL4	0.888**		
TIM1	0.841**		
TIM4	0.907**		

Table 6.24 (Continued)

Construct and items	Item-total correlation	Cronbach's alpha	CR
Benevolence		0.882	0.89
BEN1	0.854**		
BEN3	0.865**		
BEN4	0.821**		
BEN6	0.810**		
BEN7	0.789**		
Integrity		0.878	0.89
INT1	0.878**		
INT3	0.928**		
INT4	0.890**		
Credibility		0.821	0.82
COT3	0.831**		
CRE1	0.873**		
CRE2	0.871**		
Communication		0.834	0.84
COM1	0.894**		
COM2	0.837**		
COM3	0.875**		
Problem solving		0.794	0.79
PBS2	0.820**		
PBS4	0.839**		
PBS5	0.866**		
Service quality		0.704	0.71
QUA4	0.840**		
QUA5	0.827**		
QUA6	0.752**		
Satisfaction		0.901	0.90
SAT1	0.829**		
SAT3	0.887**		
SAT4	0.903**		
SAT5	0.898**		

Table 6.24 (Continued)

Construct and items	Item-total correlation	Cronbach's alpha	CR
Commitment		0.923	0.92
CMM3	0.920**		
CMM4	0.944**		
CMM5	0.930**		
Loyalty		0.831	0.84
LOY1	0.797**		
LOY4	0.749**		
LOY5	0.877**		
LOY7	0.844**		

** Correlation is significant at the 0.01 level (2-tailed).

The SERVTRUST Scale's Reliability, Its Antecedents and Consequences for Banking Service Providers.

From Table 6.25, the values of item-total correlation, Cronbach's alpha, and construct reliability were greater than the suggested cutoff values. This indicated the existence of internal consistency, therefore indicating the reliability of the scales.

Table 6.25

Cronbach's Alpha, Construct Reliability, and Item-total Correlation of SERVTRUST and Its Antecedents and Consequences for Banking Service Providers

Construct and items	Item-total correlation	Cronbach's alpha	CR
Benevolence		0.913	0.91
BEN1	0.844**		
BEN3	0.828**		
BEN4	0.833**		
BEN6	0.813**		
BEN7	0.851**		
BEN8	0.856**		

Table 6.25 (Continued)

Construct and items	Item-total correlation	Cronbach's alpha	CR
Timeliness		0.860	0.87
INF3	0.756**		
INF4	0.785**		
REL4	0.826**		
TIM1	0.797**		
TIM4	0.857**		
Integrity		0.868	0.87
INT1	0.877**		
INT2	0.884**		
INT3	0.908**		
Credibility		0.849	0.85
CRE1	0.899**		
CRE2	0.898**		
CRE3	0.833**		
Reputation		0.823	0.84
REL5	0.874**		
REL6	0.886**		
SIG2	0.835**		
Communication		0.873	0.88
COM1	0.841**		
COM2	0.876**		
COM3	0.863**		
COM5	0.836**		
Problem solving		0.869	0.87
PBS2	0.818**		
PBS3	0.858**		
PBS4	0.871**		
PBS5	0.855**		
Service quality		0.784	0.79
QUA3	0.796**		
QUA5	0.862**		
QUA6	0.856**		

Table 6.25 (Continued)

Construct and items	Item-total correlation	Cronbach's alpha	CR
Satisfaction		0.904	0.91
SAT3	0.905**		
SAT4	0.924**		
SAT5	0.919		
Commitment		0.929	0.93
CMM3	0.932**		
CMM4	0.948**		
CMM5	0.929**		
Loyalty		0.832	0.83
LOY1	0.879**		
LOY3	0.854**		
LOY5	0.864**		

** Correlation is significant at the 0.01 level (2-tailed).

The SERVTRUST Scale's Reliability, Its Antecedents and Consequences for Average Scale

From Table 6.26, the values of item-total correlation, Cronbach's alpha, and construct reliability were higher than the suggested cutoff values. This indicated the existence of internal consistency. Again, the scales were reliable.

Table 6.26

Cronbach's Alpha, Construct Reliability, and Item-total Correlation of SERVTRUST and Its Antecedents and Consequences for Average Scale

Construct and items	Item-total correlation	Cronbach's alpha	CR
Timeliness		0.830	0.84
INF4	0.859**		
TIM3	0.871**		
TIM5	0.871**		

Table 6.26 (Continued)

Construct and items	Item-total correlation	Cronbach's alpha	CR
Benevolence		0.891	0.89
BEN1	0.853**		
BEN3	0.855**		
BEN4	0.830**		
BEN6	0.831**		
BEN8	0.829**		
Expertise		0.840	0.84
EXT3	0.867**		
EXT5	0.885**		
EXT6	0.860**		
Integrity		0.917	0.92
INT1	0.860**		
INT2	0.891**		
INT3	0.938**		
INT4	0.898**		
Power		0.785	0.79
POW2	0.856**		
POW3	0.827**		
POW6	0.832**		
Communication		0.863	0.87
COM1	0.901**		
COM2	0.869**		
COM3	0.896**		
Problem solving		0.864	0.87
PBS2	0.812**		
PBS3	0.853**		
PBS4	0.868**		
PBS5	0.851**		
Service quality		0.795	0.81
QUA3	0.819**		
QUA5	0.873**		
QUA6	0.845**		

Table 6.26 (Continued)

Construct and items	Item-total correlation	Cronbach's alpha	CR
Satisfaction		0.908	0.91
SAT3	0.912**		
SAT4	0.932**		
SAT5	0.914**		
Commitment		0.933	0.93
CMM3	0.929**		
CMM4	0.951**		
CMM5	0.937**		
Loyalty		0.840	0.85
LOY1	0.845**		
LOY5	0.900**		
LOY6	0.876**		

** Correlation is significant at the 0.01 level (2-tailed).

In Table 6.24-6.26, it could be concluded that all of the studied constructs whether in health care service, banking service, or the overall were considered reliable. This was because of the acceptable degrees of cronbach's alpha, construct reliability, and item-total correlation.

Assessment of Scale's Validity

Churchill (1979) suggested the evaluation of construct validity by determining (1) whether the developed scales measured the proposed construct and (2) whether they behaved as expected. This section relates to only the first part of Churchill's suggested evaluation. The section relating to the second suggestion will be presented in chapter 8, Scale Evaluation.

In order to determine whether the developed scales measured the proposed construct, convergent validity and discriminant validity were recommended (Heeler and Ray, 1972; Churchill, 1979; Hair et al., 1998; Leo, Alan, and Frederick, 2005; Frank, Mehdi, and Simon, 2006; Hair et al., 2006a; Jason and Finney, 2007).

For convergent validity, Hair et al. (2006a) suggested that standardized loading estimates should be 0.5 or higher, and ideally 0.7 or higher, variance extracted should be 0.5 or higher, and construct reliability should be 0.7 or greater.

For disciminant validity, Hair et al. (2006a) also recommended as a rule of thumb that the variance extracted (VE) estimates for two factors should be higher than the square of the correlation between the two factors, to provide evidence of discriminant validity. However, Jason and Finney (2007) argued that the discriminant validity would be evident if the correlation between two constructs was not close to perfect correlation.

The SERVTRUST Scale's Validility, Its Antecedents and Consequences for Health Care Service Providers

The variance extracted (VE) and construct reliability (CR) were calculated and shown in Table 6.27. The results showed that all variance-extracted estimates exceeded the 50 percent rule of thumb, and all construct reliability exceeded 0.70. Combined, the evidence supports the convergent validity of the constructs. For dicriminant validity, the result in Table 6.28-6.30 showed that there was no squared correlation value greater than the variance extracted for each construct. Thus, it could be concluded that five dimensions of SERVTRUST, its antecedent and consequent constructs had discriminant validity.

Table 6.27

Construct Reliability, Variance Extracted, and Convergent Validity of SERVTRUST, Its Antecedents and Consequences for Health Care Service Providers

Construct	CR	VE	Convergent validity
SERVTRUST			
Expertise	0.87	0.69	Yes
Timeliness	0.86	0.67	Yes
Benevolence	0.89	0.61	Yes
Integrity	0.89	0.72	Yes
Credibility	0.82	0.61	Yes
Antecedents			
Communication	0.84	0.64	Yes
Problem solving	0.79	0.57	Yes
Service quality	0.76	0.52	Yes
Satisfaction	0.90	0.71	Yes
Consequences			
Commitment	0.92	0.80	Yes
Loyalty	0.84	0.57	Yes

Table 6.28

Inter-construct Squared Correlation and Variance-extracted of SERVTRUST for Health Care Service Providers

	EXT	TIM	BEN	INT	CRE
EXT	0.69*				
TIM	0.14**	0.67*			
BEN	0.56**	0.25**	0.61*		
INT	0.44**	0.18**	0.18**	0.72*	
CRE	0.56**	0.16**	0.59**	0.52**	0.61*
Discriminant validity	Yes	Yes	Yes	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Table 6.29

Inter-Construct Correlation and Variance-Extracted of Antecedents of SERVTRUST for Health Care Service Providers

	COM	PBS	QUA	SAT
COM	0.64*			
PBS	0.32**	0.57*		
QUA	0.36**	0.50**	0.52*	
SAT	0.36**	0.52**	0.47**	0.71*
Discriminant validity	Yes	Yes	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Table 6.30

Inter-Construct Correlation and Variance-Extracted of Consequences of SERVTRUST for Health Care Service Providers

	CMM	LOY
CMM	0.80*	
LOY	0.35**	0.57*
Discriminant validity	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

The SERVTRUST Scale's Validity, Its Antecedents and Consequences for Banking Service Providers

Again, the variance-extracted (VE) and construct reliability (CR) were calculated, as shown in Table 6.31. The results reveal that all variance-extracted estimates exceeded the 50 percent rule of thumb, and all construct reliability was higher than 0.70. Combined, the evidence supported the convergent validity of the constructs. For discriminant validity, Table 6.32-6.34 showed that there was no squared correlation value greater than the variance extracted of each construct. Thus, it could be concluded that five dimensions of SERVTRUST, its antecedent and consequent constructs had discriminant validity.

Table 6.31

Construct Reliability, Variance Extracted, and Convergent Validity of SERVTRUST, Its Antecedents and Consequences for Banking Service Providers

Construct	CR	VE	Convergent validity
SERVTRUST			
Benevolence	0.91	0.64	Yes
Timeliness	0.87	0.57	Yes
Integrity	0.87	0.69	Yes
Credibility	0.85	0.66	Yes
Reputation	0.84	0.63	Yes
Antecedents			
Communication	0.88	0.65	Yes
Problem solving	0.87	0.64	Yes
Service quality	0.79	0.58	Yes
Satisfaction	0.91	0.76	Yes
Consequences			
Commitment	0.93	0.82	Yes
Loyalty	0.83	0.62	Yes

Table 6.32

Inter-Construct Squared Correlation and Variance-Extracted of SERVTRUST for Banking Service Providers

	EXT	TIM	BEN	INT	CRE
EXT	0.64*				
TIM	0.37**	0.57*			
BEN	0.30**	0.26**	0.69*		
INT	0.49**	0.17**	0.42**	0.66*	
CRE	0.39**	0.31**	0.56**	0.52**	0.63*
Discriminant validity	Yes	Yes	Yes	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Table 6.33

Inter-Construct Correlation and Variance-Extracted of Antecedents of SERVTRUST for Banking Service Providers

	COM	PBS	QUA	SAT
COM	0.65*			
PBS	0.32**	0.64*		
QUA	0.29**	0.43**	0.58*	
SAT	0.41**	0.43**	0.48**	0.76*
Discriminant validity	Yes	Yes	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Table 6.34

Inter-Construct Correlation and Variance-Extracted of Consequences of SERVTRUST for Banking Service Providers

	CMM	LOY
CMM	0.82*	
LOY	0.33**	0.62*
Discriminant validity	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

The SERVTRUST Scale's Validity, Its Antecedents and Consequences for Average Sacle

Table 6.35 showed the results of the calculations of the variance-extracted (VE) and construct reliability (CR). The results showed that all variance-extracted estimates were higher than the 50 percent rule of thumb, and all construct reliability exceeded 0.70. Combined, the evidence supported the convergent validity of the constructs. For discriminant validity, Table 6.36-6.38 showed that there was no squared correlation value greater than the variance extracted of each construct. Thus, it could be concluded that five dimensions of SERVTRUST, its antecedent and consequent constructs had discriminant validity.

Table 6.35

Construct Reliability, Variance Extracted, and Convergent Validity of SERVTRUST, Its Antecedents and Consequences for Average Scale

Construct	CR	VE	Convergent validity
SERVTRUST			
Timeliness	0.84	0.64	Yes
Benevolence	0.89	0.63	Yes
Expertise	0.84	0.64	Yes
Integrity	0.92	0.75	Yes
Power	0.79	0.56	Yes
Antecedents			
Communication	0.87	0.68	Yes
Problem solving	0.87	0.63	Yes
Service quality	0.81	0.59	Yes
Satisfaction	0.91	0.77	Yes
Consequences			
Commitment	0.93	0.83	Yes
Loyalty	0.85	0.66	Yes

Table 6.36

Inter-Construct Squared Correlation and Variance-Extracted of SERVTRUST for Average Scale

	TIM	BEN	EXT	INT	POW
TIM	0.64*				
BEN	0.46**	0.63*			
EXT	0.38**	0.55**	0.64*		
INT	0.35**	0.32**	0.49**	0.75*	
POW	0.49**	0.53**	0.55**	0.36**	0.56*
Discriminant validity	Yes	Yes	Yes	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Table 6.37

Inter-Construct Correlation and Variance-Extracted of Antecedents of SERVTRUST for Average Scale

	COM	PBS	QUA	SAT
COM	0.68*			
PBS	0.32**	0.63*		
QUA	0.32**	0.46**	0.59*	
SAT	0.39**	0.44**	0.51**	0.77*
Discriminant validity	Yes	Yes	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Table 6.38

Inter-Construct Correlation and Variance-Extracted of Consequences of SERVTRUST for Average Scale

	CMM	LOY
CMM	0.83*	
LOY	0.28**	0.66*
Discriminant validity	Yes	Yes

* Variance-extracted, ** Inter-construct squared correlation

Conclusion

From the EFA stage, it was found that some items did not belong to the proposed factors. In contrast, some dimensions were clearly identified as proposed. For health care services, doctors in particular, SERVTRUST could be divided into 12 dimensions: expertise; timeliness; benevolence; power; integrity; confidentiality; signal; reliability; friendship; experience; information sharing; and credibility. SERVTRUST for banking services could also be divided into 12 dimensions: benevolence; timeliness; integrity; experience; credibility; confidentiality; power; reputation; friendship; information sharing; expertise; and reliability. For average scale, SERVTRUST could be divided into 11 dimensions: timeliness; benevolence; expertise; signals of reliability; integrity; confidentiality; power; credibility; friendship; information sharing; and privacy. Each dimension featured Cronbach's

alpha and a total reliability higher than 0.70. For item-total correlation of each component with the total score, the correlations were medium-high. Thus, the acceptable reliability of the constructs led to the preliminary conclusion about the existence of construct validity. For antecedent and consequent constructs of SERVTRUST for all three categories, Exploratory Factor Analysis (EFA) showed that each construct contained only one factor as proposed, with acceptable values of KMO, factor loading, and cronbach's alpha. However, it was needed to assess whether the scales conform to what was expected Confirmatory Factor Analysis (CFA) on the basis of pre-established theory.

From CFA, it was found that not all dimensions of SERVTRUST remained in the finalized scales. For health care services, it was found that SERVTRUST consisted of expertise, timeliness, benevolence, integrity, and credibility. For banking services, SERVTRUST consisted of benevolence, timeliness, integrity, credibility, and reputation. Moreover, after CFA of SERVTRUST for average scale was completed, it was found that the scale consisted of timeliness, benevolence, expertise, integrity, and power. This procedure was employed to analyze its antecedent and consequent constructs. Then, the variance extracted and construct reliability were calculated. The results showed that all values were higher than 0.50 and 0.70 respectively. Hence, the construct reliability and convergent validity were supported. Finally, discriminant validity of the constructs was analyzed and it was found that all variance extracted was greater than inter-construct squared correlation estimates. As a result, discriminant validity of the constructs was confirmed.