

Chapter 7

Scale Evaluation

Introduction

In the previous chapter, the reliability and validity of all constructs was shown to be acceptable. However, there is not enough evidence to show the application of the developed scales without testing nomological validity, which will indicate whether the developed scale behaves as expected (Churchill, 1979; Parasuraman et al., 1988; Hair et al., 1998; Leo et al., 2005; Parasuraman et al., 2005; Hair et al., 2006a).

In this chapter, structural model and hypothesis testing among antecedents, SERVTRUST, and consequent constructs were analyzed to show the nomological validity of the SERVTRUST scale within each category of service provider.

All summated components of SERVTRUST's components was employed for SEM analysis (Parasuraman et al., 2005). In hypotheses testing, four causes of SERVTRUST (communication, problem solving, quality of the service, and satisfaction) were proposed. In addition, two consequences of SERVTRUST (commitment, and loyalty) were hypothesized as discussed earlier in chapter 4. The nomological validity of the scale was then presented.

Structural Equation Model

Structural Equation Modeling, or SEM, was employed in this study in order to test the relationships among multiple variables by specifying the structural model (Hair et al., 2006a). SEM has been considered "a powerful multivariate data analysis in social science research" (Mueller, 1996). In this study, the relationships among antecedent constructs, SERVTRUST, and consequent constructs as proposed in chapter 4 would be tested simultaneously. This would provide the evidence of hypothesized relationships and the scale's nomological validity.

This study used a maximum likelihood as an estimation method because it has been claimed that it is the most widely preferred and provides a good estimation even when the data are not normally distributed (Hoyle, 1995; Rauyruen, 2005). In order to consider the fit of the model, many statistical fit indices have been determined. Hair et al. (2006a) suggested that, in assessing the fit of SEM, the same fit indices and values as CFA model should be presented. They recommended at least three types of fit indices. Firstly, the absolute fit measures which show the fit of researcher's theory with the sample data. Chi-square statistic (χ^2), Normed χ^2 (χ^2/df), Goodness-of-fit index (GFI), Standardized root mean residual (SRMR), and Root mean square error of approximation (RMSEA) were recommended and presented in the study. Secondly, incremental fit indices were suggested to assess the fit of the specified model and null model. Normed Fit Index (NFI), and Comparative Fit Index (CFI) would be analyzed to show the model's incremental fit. Finally, the parsimony fit indices were recommended to determine the best model. However, they will not be presented because the purposes of this study are limited to test the behavior of the developed scale. Table 7.1 shows the cutoff values for presented fit indices as suggested by previous researchers.

Table 7.1
Cutoff Values of Fit Indices

Fit indices	Cutoff value	Sources
χ^2	Small and not significant $p > 0.05$	Hair et al. (1998; 2006a), Bollen (1989), Joreskog and Sorbom (1996)
χ^2/df	< 3	Hair et al. (1998; 2006a)
RMSEA	< 0.08	Hair et al. (1998; 2006a), Browne and Cudeck (1993)
NFI	> 0.90	Hair et al. (1998; 2006a), Mueller (1996).
CFI	> 0.90	Hair et al. (1998; 2006a), Mueller (1996).
SRMR	< 0.08	Hair et al. (1998; 2006a), Hu and Bentler (1999)
GFI	> 0.90	Hair et al. (1998; 2006a), Hu and Bentler (1999)
AGFI	> 0.80	Durande-Moreau and Usunier (1999), Harrison-Walker (2001)

In order to estimate the parameters of SEM, the proposed antecedents and consequences, which were already confirmed, were employed together with SERVTRUST for each category. However, SERVTRUST which is proposed as the mediator should be treated as a second-order latent construct consisting of many dimensions. The scores were first computed for each dimension. Then, the summed score of each dimension was used as the indicator of the latent SERVTRUST variable. This method was used when Parasuraman et al. (2005) developed a multiple-item scale for assessing electronic service quality or E-S-QUAL.

To obtain a better fit, each model was modified by deleting some bad fit items until the model fit indices were acceptable. For the new scale development justification, items for antecedents and consequences were the same for all categories. All error terms were not allowed to correlate with each other in order to confirm that there was not some semantic overlap. The results of SEM are presented in the following section according to each service industry.

SEM of SERVTRUST for Health Care Service Providers

The final structural model of SERVTRUST for health care service providers is presented in Figure 7.1 together with the standardized estimated values. From the model, there were four exogenous and three endogenous constructs. DST represented the SERVTRUST for the health care service provider measurement scale, which contained five dimensions: expertise; timeliness; benevolence; integrity; and credibility. For its antecedent latent variables, there were eight indicators for four constructs, which were communication, problem solving, service quality, and satisfaction. For consequences of SERVTRUST for health care service providers, there were five indicators for two constructs, which were commitment and loyalty. All structural paths in the model were significant at $p < 0.05$, except for path from service quality to SERVTRUST. More detail about structural paths will be presented in the hypotheses testing section.

This model had an acceptable fit based on the fit indices which are presented in Table 7.2. Despite the significance of the chi-square value presented, Hair et al. (2006a) argued that this circumstance could be acceptable if the sample

size was large. Other fit indices exceeded the acceptable standards (RMSEA=0.073, NFI=0.97, CFI=0.98, SRMR=0.050, GFI=0.90, AGFI=0.87) except for χ^2/df (3.14) which was slightly higher than suggested cutoff value.

Figure 7.1

Structural Model of SERVTRUST for Health Care Service Providers

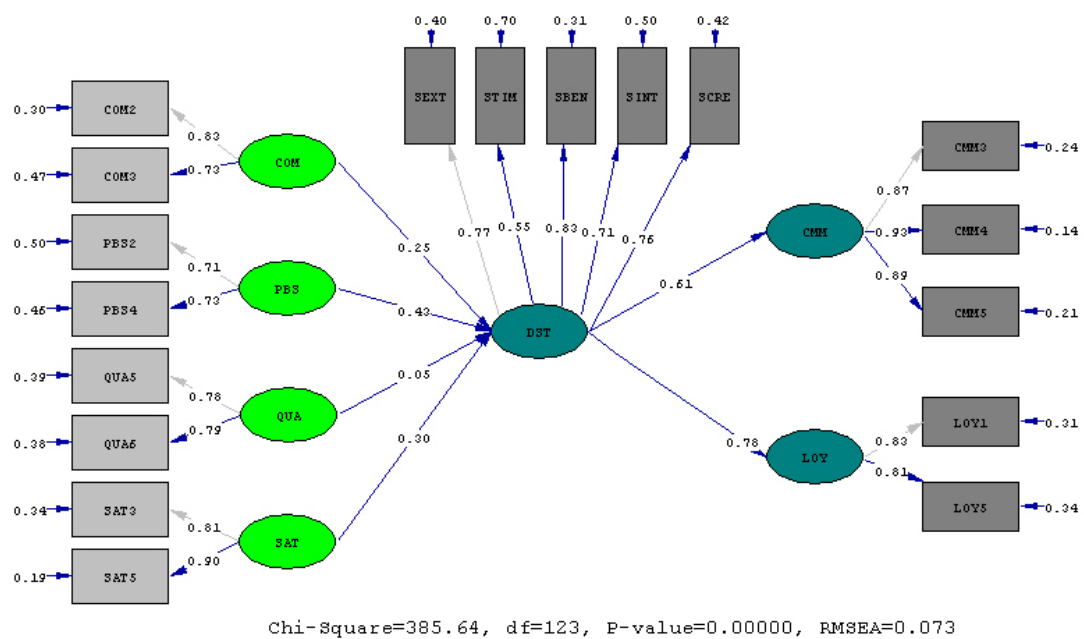


Table 7.2

SEM Fit Statistics of SERVTRUST for Health Care Service Providers

Model	Fit indices										
	χ^2	P-value	DF	χ^2/DF	RMSEA	NFI	CFI	SRMR	GFI	AGFI	Result
SERVTRUST for Health care service provider	385.64	0.00	123	3.14	0.073	0.97	0.98	0.050	0.90	0.87	Passed

Total, direct and indirect effects of predictors and mediating factors are presented in Table 7.3. For SERVTRUST, 89 percent of its total variation can be explained by the regression model consisting of communication, problem solving, service quality, and satisfaction. Problem solving is the most important antecedent of

SERVTRUST for health care service providers ($\beta=0.43$) followed by satisfaction ($\beta=0.30$), and communication ($\beta=0.25$). They have significant positive direct effects on SERVTRUST only.

Although, service quality has insignificant direct effects on SERVTRUST, its effect direction is positive as expected. For commitment, it was found that 37 percent of its total variation can be explained by the regression model consisting of SERVTRUST, communication, problem solving, service quality, and satisfaction. SERVTRUST is the only construct which has a direct effect on commitment with a significant level at 0.05. The other four constructs only have significant indirect effects on commitment, except service quality. For loyalty, 60 percent of its total variation can be explained by the regression model of SERVTRUST, communication, problem solving, service quality, and satisfaction. As for commitment, SERVTRUST is the only construct which has a significant direct effect on loyalty. The other four constructs only have significant indirect effects on loyalty, except service quality. In summary, problem-solving has the most influence on the level of trust for health care service providers while service quality was not a significant predictor of SERVTRUST. The total effects of SERVTRUST on the consequences constructs showed that loyalty was more affected and explained than commitment. Indirectly, problem solving had the most influence on loyalty and commitment.

Table 7.3
Total, Direct and Indirect Effect of Structural Model of SERVTRUST Scale
for Health Care Service Providers

Construct	R ²	Path coefficient	SERVTRUST	Communication	Problem solving	Service quality	Satisfaction
SERVTRUST	0.89	DE		0.25**	0.43*	0.05	0.30**
		IE					
		TE		0.25**	0.43*	0.05	0.30**
Commitment	0.37	DE	0.61**				
		IE		0.16**	0.26*	0.03	0.19**
		TE	0.61**	0.16**	0.26*	0.03	0.19**
Loyalty	0.60	DE	0.78**				
		IE		0.20**	0.33*	0.04	0.24**
		TE	0.78**	0.20**	0.33*	0.04	0.24**

DE = Direct effect, IE = Indirect effect, TE = Total effect

* Significance at $p < 0.05$ ** Significance at $p < 0.01$

From Table 7.4, the Sobel test was employed to test the mediating effect of the mediator, which is SERVTRUST. Using the online calculator for the Sobel test (Preacher and Leonardelli, 2003), it was found that SERVTRUST is a full mediator between communication and commitment with a significance level of 0.01. For the others, SERVTRUST was considered as a partial mediator between its antecedent and consequent variables. As a result, it can be concluded that SERVTRUST for health care service providers acts as a mediator between the antecedents of trust (communication, problem solving, service quality, and satisfaction) and consequences of trust (commitment, and loyalty).

Table 7.4

The Test of Mediating Effect of SERVTRUST for Health Care Service Provider

Test group	Coefficient	Sig	S.E.	Z-test	P-value	Result
COM>DST>CMM				2.575	0.01	Full
• COM>DST	0.671	0.00	0.260			
• COM>CMM	0.388	0.00	0.081			
• DST>CMM	0.524	0.00	0.014			
• COM'>CMM'	0.036	0.52	0.099			
COM>DST>LOY				2.579	0.01	Partial
• COM>DST	0.671	0.00	0.260			
• COM>LOY	0.467	0.00	0.048			
• DST>LOY	0.539	0.00	0.008			
• COM'>LOY'	0.105	0.05	0.058			
PBS>DST>CMM				2.537	0.01	Partial
• PBS>DST	0.675	0.00	0.265			
• PBS>CMM	0.495	0.00	0.078			
• DST>CMM	0.393	0.00	0.014			
• PBS'>CMM'	0.231	0.00	0.100			
PBS>DST>LOY				2.545	0.01	Partial
• PBS>DST	0.675	0.00	0.265			
• PBS>LOY	0.537	0.00	0.047			
• DST>LOY	0.454	0.00	0.008			
• PBS'>LOY'	0.230	0.00	0.059			
QUA>DST>CMM				2.606	0.01	Partial
• QUA>DST	0.704	0.00	0.269			
• QUA>CMM	0.471	0.00	0.084			
• DST>CMM	0.429	0.00	0.015			
• QUA'>CMM'	0.169	0.00	0.111			
QUA>DST>LOY				2.614	0.01	Partial
• QUA>DST	0.704	0.00	0.269			
• QUA>LOY	0.527	0.00	0.050			
• DST>LOY	0.473	0.00	0.009			
• QUA'>LOY'	0.193	0.00	0.065			

Table 7.4 (Continued)

Test group	Coefficient	Sig	S.E.	Z-test	P-value	Result
SAT>DST>CMM				20.667	0.00	Partial
• SAT>DST	0.548	0.00	0.011			
• SAT>CMM	0.550	0.00	0.078			
• DST>CMM	0.318	0.00	0.014			
• SAT'>CMM'	0.325	0.00	0.107			
SAT>DST>LOY				34.09	0.00	Partial
• SAT>DST	0.548	0.00	0.011			
• SAT>LOY	0.598	0.00	0.047			
• DST>LOY	0.374	0.00	0.008			
• SAT'>LOY'	0.333	0.00	0.063			

SEM of SERVTRUST for Banking Service Providers

After the SEM of SERVTRUST for banking service providers was analyzed, the final structural model for this is presented in Figure 7.2 together with the standardized estimate values. From the model, there were four exogenous and three endogenous constructs. BST represented the SERVTRUST for banking service provider measurement scale, which contained five dimensions: benevolence; timeliness; integrity; credibility; and reputation. SERVTRUST for banking service providers, with its antecedent latent variables, contained eight indicators for four constructs which were communication, problem solving, service quality, and satisfaction. There were the same five indicators for two consequent constructs which were commitment and loyalty. The results showed that all structural paths in the model were significant at $p < 0.05$, except for the path from service quality to SERVTRUST. More details about structural paths are presented in the hypotheses testing section.

This model had acceptable fit based on the fit indices which are presented in Table 7.5. Because of the large sample size, the chi-square test was significant but it was not enough to reject this model. Other fit indices all exceeded acceptable standards ($\chi^2/df=2.97$, RMSEA=0.070, NFI=0.98, CFI=0.98, SRMR=0.049, GFI=0.91, AGFI=0.87).

Figure 7.2

Structural Model of SERVTRUST for Banking Service Providers

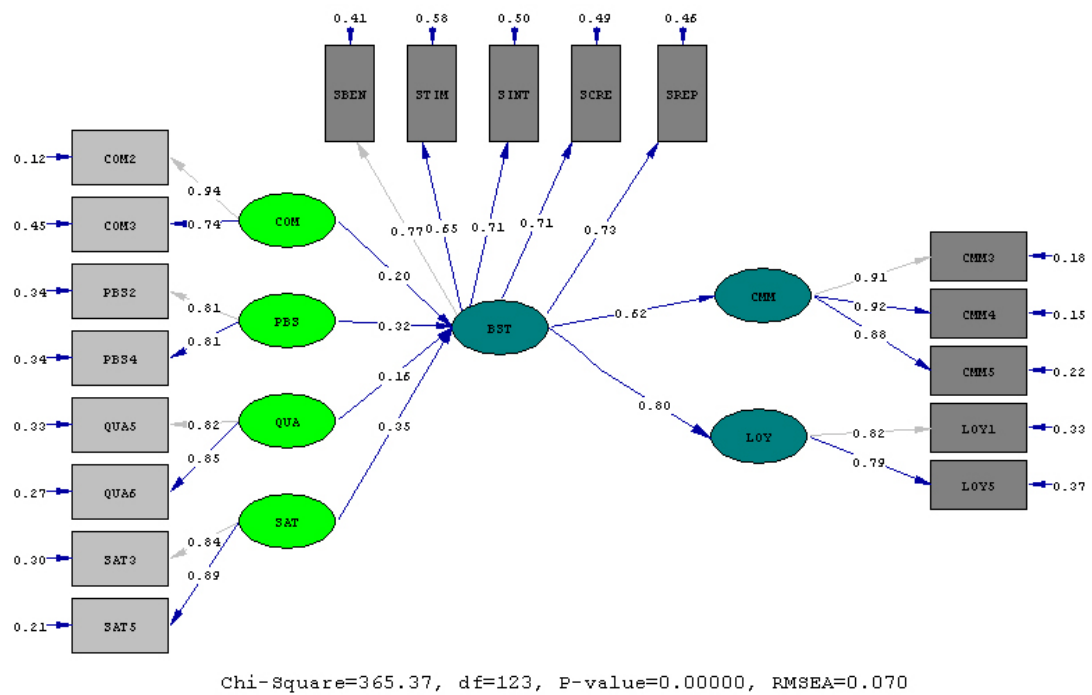


Table 7.5

SEM Fit Statistics of SERVTRUST for Banking Service Provider

Model	Fit indices										
	χ^2	P-value	DF	χ^2/DF	RMSEA	NFI	CFI	SRMR	GFI	AGFI	Result
SERVTRUST for banking service provider	365.37	0.00	123	2.97	0.070	0.98	0.98	0.049	0.91	0.87	Passed

Total, direct and indirect effects of predictors and mediating factors are presented in Table 7.6. For SERVTRUST, it was found that 86 percent of its total variation can be explained by the regression model consisting of communication, problem solving, service quality, and satisfaction. Satisfaction is the most important antecedent of SERVTRUST for banking service providers ($\beta=0.35$) followed by problem solving ($\beta=0.32$), communication ($\beta=0.20$), and service quality ($\beta=0.16$).

Excluding service quality, they have significant positive direct effects on SERVTRUST. Although, service quality has insignificant direct effects on SERVTRUST, its effect direction is positive as expected. For commitment, it was found that 38 percent of its total variation can be explained by the regression model consisting of SERVTRUST, communication, problem solving, service quality, and satisfaction. SERVTRUST is the only construct which has a direct effect on commitment with a significance level of 0.05. The other four constructs have only significant indirect effects on commitment, except service quality. For loyalty, 64 percent of its total variation can be explained by the regression model of SERVTRUST, communication, problem solving, service quality, and satisfaction. As for commitment, SERVTRUST is the only construct which has a significant direct effect on loyalty. The other four constructs only have significant indirect effects on loyalty, except service quality. In summary, satisfaction has the most influence on the level of trust for banking service providers, while service quality was an insignificant predictor of SERVTRUST. The total effects of SERVTRUST on the consequent constructs showed that loyalty was more affected and explained than commitment. Indirectly, satisfaction had the most influence on loyalty and commitment.

Table 7.6
Total, Direct, and Indirect Effect of Structural Model of SERVTRUST
for Banking Service Providers

Construct	R ²	Path coefficient	SERVTRUST	Communication	Problem solving	Service quality	Satisfaction
SERVTRUST	0.86	DE		0.20**	0.32**	0.16	0.35**
		IE					
		TE		0.20**	0.32**	0.16	0.35**
Commitment	0.38	DE	0.62**				
		IE		0.12**	0.19**	0.10	0.22**
		TE	0.62**	0.12**	0.19**	0.10	0.22**
Loyalty	0.64	DE	0.80**				
		IE		0.16**	0.25**	0.13	0.25**
		TE	0.80**	0.16**	0.25**	0.13	0.28**

DE = Direct effect, IE = Indirect effect, TE = Total effect

* Significance at $p < 0.05$ ** Significance at $p < 0.01$

From Table 7.7, the Sobel test was employed to test the mediating effect of the mediator, which is SERVTRUST. Using the online calculator for the Sobel test (Preacher and Leonardelli, 2003), it was found that SERVTRUST is a full mediator only between communication and commitment with a significance level of 0.05. For the others, SERVTRUST was considered as a partial mediator between its antecedent and consequent variables. As a result, it can be concluded that SERVTRUST for banking service providers acts as a mediator between the antecedents of trust (communication, problem solving, service quality, and satisfaction) and consequences of trust (commitment, and loyalty). This is the same as the test of mediating effects of SERVTRUST for health care service providers.

Table 7.7

The Test of Mediating Effect of SERVTRUST for Banking Service Provider

Test group	Coefficient	Sig	S.E.	Z-test	P-value	Result
COM>BST>CMM				2.092	0.04	Full
• COM>BST	0.664	0.00	0.317			
• COM>CMM	0.411	0.00	0.080			
• BST>CMM	0.474	0.00	0.012			
• COM'>CMM'	0.096	0.09	0.099			
COM>BST>LOY				2.094	0.04	Partial
• COM>BST	0.664	0.00	0.317			
• COM>LOY	0.470	0.00	0.045			
• BST>LOY	0.500	0.00	0.007			
• COM'>LOY'	0.138	0.01	0.055			
PBS>BST>CMM				2.257	0.02	Partial
• PBS>BST	0.682	0.00	0.301			
• PBS>CMM	0.541	0.00	0.072			
• BST>CMM	0.316	0.00	0.012			
• PBS'>CMM'	0.325	0.00	0.094			
PBS>BST>LOY				2.264	0.02	Partial
• PBS>BST	0.682	0.00	0.301			
• PBS>LOY	0.539	0.00	0.042			
• BST>LOY	0.418	0.00	0.007			
• PBS'>LOY'	0.254	0.00	0.054			
QUA>BST>CMM				2.122	0.03	Partial
• QUA>BST	0.661	0.00	0.311			
• QUA>CMM	0.439	0.00	0.077			
• BST>CMM	0.440	0.00	0.012			
• QUA'>CMM'	0.148	0.01	0.096			

Table 7.7 (Continued)

Test group	Coefficient	Sig	S.E.	Z-test	P-value	Result
QUA>BST>LOY				2.124	0.03	Partial
• QUA>BST	0.661	0.00	0.311			
• QUA>LOY	0.573	0.00	0.041			
• BST>LOY	0.378	0.00	0.006			
• QUA'>LOY'	0.323	0.00	0.052			
SAT>BST>CMM				2.035	0.04	Partial
• SAT>BST	0.690	0.00	0.338			
• SAT>CMM	0.541	0.00	0.082			
• BST>CMM	0.314	0.00	0.012			
• SAT'>CMM'	0.324	0.00	0.109			
SAT>BST>LOY				2.039	0.04	Partial
• SAT>BST	0.690	0.00	0.338			
• SAT>LOY	0.620	0.00	0.045			
• BST>LOY	0.312	0.00	0.006			
• SAT'>LOY'	0.404	0.00	0.059			

SEM of SERVTRUST for Average Scale

Finally, the SEM of SERVTRUST for average scale is analyzed and presented in Figure 7.3 together with the standardized estimate values. From the figure, there were four exogenous and three endogenous constructs. AST represented the SERVTRUST for average measurement scale which contained five dimensions: timeliness, benevolence, expertise, integrity, and power. SERVTRUST for average scale, with its antecedent latent variables, contained eight indicators for four constructs which were communication, problem solving, service quality, and satisfaction. There were the same five indicators for two consequent constructs which were commitment and loyalty. The results showed that all structural paths in the model were significant at $p < 0.05$, except for the path from service quality to SERVTRUST as presented in the two previous models. More details about structural paths are presented in the hypotheses testing section.

This model had acceptable fit based on the fit indices which were presented in Table 7.8. The chi-square test was significant but it was not enough to reject this model as stated earlier. Other fit indices all exceeded acceptable standards

($\chi^2/df=2.73$, RMSEA=0.066, NFI=0.98, CFI=0.99, SRMR=0.041, GFI=0.91, AGFI=0.88).

Figure 7.3
Structural Model of SERVTRUST for Average Scale

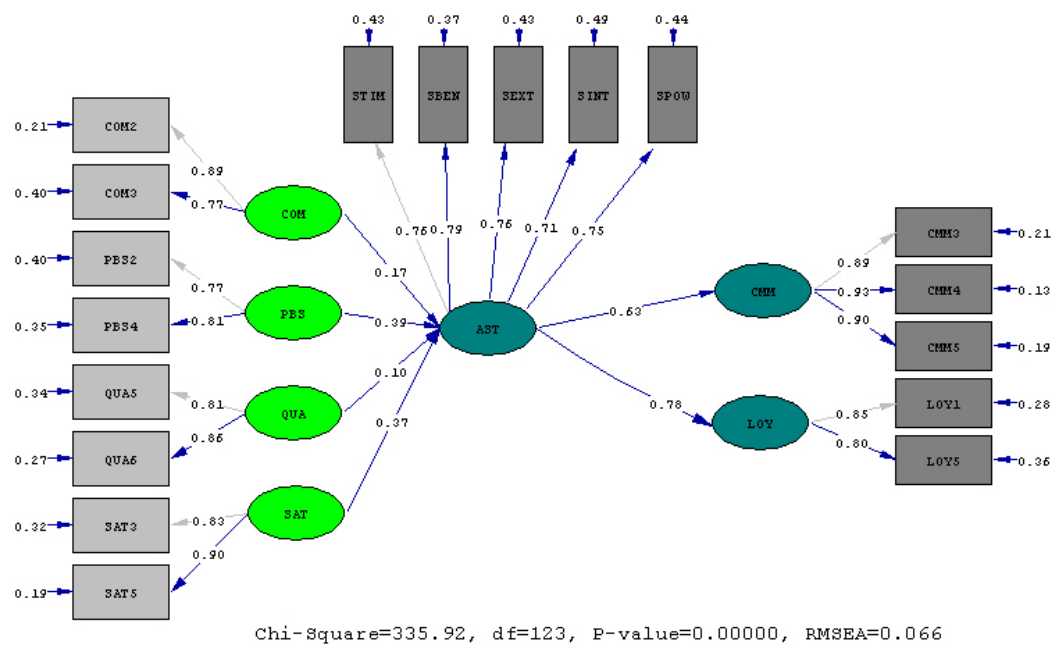


Table 7.8
SEM Fit Statistics of SERVTRUST for Average Scale

Model	Fit indices										
	χ^2	P-value	DF	χ^2/DF	RMSEA	NFI	CFI	SRMR	GFI	AGFI	Result
SERVTRUST for Average	335.92	0.00	123	2.73	0.066	0.98	0.99	0.041	0.91	0.88	Passed

In total, direct and indirect effects of predictors and mediating factors are presented in Table 7.9. For SERVTRUST, it was found that 88 percent of its total variation can be explained by the regression model consisting of communication, problem solving, service quality, and satisfaction. As in the case of health care

services, problem solving is the most important antecedent of SERVTRUST for average scale ($\beta=0.39$) followed by satisfaction ($\beta=0.37$), communication ($\beta=0.17$), and service quality ($\beta=0.10$). Excluding service quality, they have significant positive direct effects on SERVTRUST. Although, service quality has insignificant direct effects on SERVTRUST, its effect direction is positive as expected. For commitment, it was found that 40 percent of its total variation can be explained by the regression model consisting of SERVTRUST, communication, problem solving, service quality, and satisfaction. SERVTRUST is the only one construct which has a direct effect on commitment with a significance level of 0.01. The other four constructs only have significant indirect effects on commitment, except service quality. For loyalty, 61 percent of its total variation can be explained by the regression model of SERVTRUST, communication, problem solving, service quality, and satisfaction. As for commitment, SERVTRUST is the only construct which has a significant direct effect on loyalty. The other four constructs only have significant indirect effects on loyalty, except service quality. In summary, problem solving has the most influence on the level of trust for average scale while service quality was an insignificant predictor of SERVTRUST. The total effects of SERVTRUST on the consequent constructs showed that loyalty was more affected and explained than commitment, as in the previous two models. Indirectly, problem solving had the most influence on loyalty and commitment.

Table 7.9

Total, Direct, and Indirect Effect of Structural Model of SERVTRUST for Average Scale

Construct	R ²	Path coefficient	SERVTRUST	Communication	Problem solving	Service quality	Satisfaction
SERVTRUST	0.88	DE		0.17**	0.39**	0.10	0.37**
		IE					
		TE		0.17**	0.39**	0.10	0.37**
Commitment	0.40	DE	0.63**				
		IE		0.11**	0.25**	0.07	0.23**
		TE	0.63**	0.11**	0.25**	0.07	0.23**
Loyalty	0.61	DE	0.78**				
		IE		0.13**	0.31**	0.08	0.29**
		TE	0.78**	0.13**	0.31**	0.08	0.29**

DE = Direct effect, IE = Indirect effect, TE = Total effect

* Significance at $p < 0.05$ ** Significance at $p < 0.01$

From Table 7.10, the Sobel test was employed to test the mediating effect of the mediator, which is SERVTRUST. Using the online calculator for the Sobel test (Preacher and Leonardelli, 2003), it was found that SERVTRUST is a full mediator only between communication and commitment with a significance level of 0.05. For others, SERVTRUST was considered as a partial mediator between its antecedent and consequent variables. As a result, it can be concluded that SERVTRUST for average scale acts as a mediator between the antecedents of trust (communication, problem solving, service quality, and satisfaction) and consequences of trust (commitment, and loyalty). This is the same as the test of mediating effect of SERVTRUST for the previous two models.

Table 7.10
The Test of Mediating Effect of SERVTRUST for Average Scale

Test group	Coefficient	Sig	S.E.	Z-test	P-value	Result
COM>AST>CMM				2.496	0.01	Full
• COM>AST	0.668	0.00	0.267			
• COM>CMM	0.401	0.00	0.082			
• AST>CMM	0.531	0.00	0.014			
• COM'>CMM'	0.046	0.41	0.100			
COM>AST>LOY				2.500	0.01	Partial
• COM>AST	0.668	0.00	0.267			
• COM>LOY	0.477	0.00	0.046			
• AST>LOY	0.556	0.00	0.008			
• COM'>LOY'	0.106	0.04	0.054			
PBS>AST>CMM				2.715	0.01	Partial
• PBS>AST	0.704	0.00	0.258			
• PBS>CMM	0.522	0.00	0.077			
• AST>CMM	0.385	0.00	0.014			
• PBS'>CMM'	0.251	0.00	0.103			
PBS>AST>LOY				2.726	0.01	Partial
• PBS>AST	0.704	0.00	0.258			
• PBS>LOY	0.546	0.00	0.044			
• AST>LOY	0.480	0.00	0.008			
• PBS'>LOY'	0.280	0.00	0.057			
QUA>AST>CMM				2.672	0.01	Partial
• QUA>AST	0.721	0.00	0.269			
• QUA>CMM	0.443	0.00	0.087			
• AST>CMM	0.505	0.00	0.015			
• QUA'>CMM'	0.078	0.19	0.116			

Table 7.10 (Continued)

Test group	Coefficient	Sig	S.E.	Z-test	P-value	Result
QUA>AST>LOY				2.677	0.01	Partial
• QUA>AST	0.721	0.00	0.269			
• QUA>LOY	0.570	0.00	0.046			
• AST>LOY	0.449	0.00	0.008			
• QUA'>LOY'	0.246	0.00	0.062			
SAT>AST>CMM				2.644	0.01	Partial
• SAT>AST	0.734	0.00	0.276			
• SAT>CMM	0.532	0.00	0.086			
• AST>CMM	0.371	0.00	0.015			
• SAT'>CMM'	0.260	0.00	0.121			
SAT>AST>LOY				2.656	0.01	Partial
• SAT>AST	0.734	0.00	0.276			
• SAT>LOY	0.599	0.00	0.047			
• AST>LOY	0.404	0.00	0.008			
• SAT'>LOY'	0.302	0.00	0.065			

In conclusion, all three models presented the same antecedent and consequent latent variables, and their indicators as well. Only the dimensions of SERVTRUST scales were different, based on the exploratory and confirmatory factor analysis results of each service sectors. In general, the results indicated acceptable fit indices although the chi-squares were significant because of the large sample size. Problem solving and Satisfaction were the two most influential on the degree of SERVTRUST for health care and banking service providers respectively. Service quality is insignificant predictor of the SERVTRUST, however, the relationship is positive as expected. All structural paths in the three models were significant at $p < 0.05$, except for the path from service quality to SERVTRUST. The test of mediating effect using the Sobel test revealed that the SERVTRUST is a partial mediator between the antecedent of trust (communication, problem solving, service quality, and satisfaction) and its consequences (commitment, and loyalty). The next section shows the results of hypothesis testing.

Hypotheses Testing

In chapter 3, six main hypotheses were proposed for the relationships between SERVTRUST and its antecedent and consequent latent variables. After SEM was analyzed, the results of hypothesis testing were calculated. These results have led to the conclusion of scale nomological validity which will be described later.

Hypotheses Testing for Health Care Services

Table 7.11, shows the results of hypotheses testing of the SERVTRUST scale for health care service providers. The results indicated that all hypotheses structural paths were supported at $p < 0.05$ or 0.01, except the hypothesis H_3 between service quality and SERVTRUST. Although H_3 was not supported, its relationship direction was as expected. Discussions and implications of this will be presented in chapter 8.

Table 7.11

Hypotheses Testing Results of SERVTRUST's Structural Model for Health Care Services

Hypothesis	Direction	Standardized Total Effect	t-value	Hypothesis supported
H ₁ : Communication & SERVTRUST	Positive	0.25	3.80	Yes
H ₂ : Problem solving & SERVTRUST	Positive	0.43	2.29	Yes
H ₃ : Service quality & SERVTRUST	Positive	0.05	0.24	No
H ₄ : Satisfaction & SERVTRUST	Positive	0.30	3.41	Yes
H ₅ : SERVTRUST & Commitment	Positive	0.61	11.41	Yes
H ₆ : SERVTRUST & Loyalty	Positive	0.78	13.25	Yes

Hypotheses Testing for Banking Services

Table 7.12 shows the results of hypotheses testing of the SERVTRUST scale for banking service providers. As for health care services, the results indicated

that all hypotheses structural paths were supported at $p < 0.05$ or 0.01 , except hypothesis H_3 between service quality and SERVTRUST. Although H_3 was not supported, its relationship direction was as expected. Discussions and implications of this will be presented in chapter 8.

Table 7.12

Hypotheses Testing Result of SERVTRUST's Structural Model for Banking Services

Hypotheses	Direction	Standardized Total Effect	t-value	Hypotheses supported
H ₁ : Communication & SERVTRUST	Positive	0.20	3.67	Yes
H ₂ : Problem solving & SERVTRUST	Positive	0.32	3.98	Yes
H ₃ : Service quality & SERVTRUST	Positive	0.16	1.94	No
H ₄ : Satisfaction & SERVTRUST	Positive	0.35	4.53	Yes
H ₅ : SERVTRUST & Commitment	Positive	0.62	11.63	Yes
H ₆ : SERVTRUST & Loyalty	Positive	0.80	13.26	Yes

Hypotheses Testing for Average Scale

Table 7.13 shows the results of hypotheses testing of the SERVTRUST for average scale. The results indicated that all hypotheses structural paths were supported at $p < 0.05$ or 0.01 , except hypothesis H_3 between service quality and SERVTRUST. Although H_3 was not supported, its relationship direction was as expected. This was the same result as found for health care and banking services. Discussion and implications of this will be presented in chapter 8.

Table 7.13

Hypotheses Testing Result of SERVTRUST's Structural Model for Average Scale

Hypotheses	Direction	Standardized Total Effect	t-value	Hypotheses supported
H ₁ : Communication & SERVTRUST	Positive	0.17	3.06	Yes
H ₂ : Problem solving & SERVTRUST	Positive	0.39	4.31	Yes
H ₃ : Service quality & SERVTRUST	Positive	0.10	1.00	No
H ₄ : Satisfaction & SERVTRUST	Positive	0.37	4.59	Yes
H ₅ : SERVTRUST & Commitment	Positive	0.63	11.85	Yes
H ₆ : SERVTRUST & Loyalty	Positive	0.78	13.37	Yes

Table 7.14

Conclusion of Hypotheses Testing Result of SERVTRUST's Structural Model

Hypotheses	Direction	Hypotheses supported
H ₁ : Communication & SERVTRUST	Positive	Yes
H ₂ : Problem solving & SERVTRUST	Positive	Yes
H ₃ : Service quality & SERVTRUST	Positive	No
H ₄ : Satisfaction & SERVTRUST	Positive	Yes
H ₅ : SERVTRUST & Commitment	Positive	Yes
H ₆ : SERVTRUST & Loyalty	Positive	Yes

In conclusion, Table 7.14 shows the overall summary of the hypotheses testing in the three categories: health care services; banking services; and for average scale. It indicates that all hypothesized relationships were supported at $p < 0.05$ or $p < 0.01$, except the relationship between service quality and SERVTRUST. Hence, the level of Thai consumer's trust (SERVTRUST) for service providers depends on (1) the communication between a service provider and customer, (2) the ability of a service provider in solving the problems which the customer has experienced, and (3) the customer's satisfaction. Finally, when the service provider was trusted, the customer would commit and remain loyal to the service provider. Discussion and implications of this will be presented in chapter 8.

Nomological Validity Testing

Following Churchill's (1979) suggestion, assessing whether the developed scale behave as expected to other constructs was the final step in scale evaluation. In this section, the nomological validity of the scale is shown based on the previous analyses in chapter 6 and 7.

Nomological validity refers to "the degree that the summated scale makes accurate predictions of other concepts in a theoretically based model" (Hair et al., 2006a). It is often referred to as criterion validity (Churchill, 1979; DeVellis, 2003) or predictive validity (DeVellis, 2003). Two approaches were recommended in order to support nomological validity. Firstly, correlation coefficients showing the correlation among the constructs are suggested (DeVellis, 2003; Hair et al., 2006a). However, Ghiselli et al. (1981) argued that the correlation coefficient was inadequate when predictive accuracy was required. Secondly, Hair et al. (2006a) suggested that demonstrating the relationships among the studied constructs and other constructs which support the theoretical framework should be included. Thus, in this study both approaches were presented.

Tables 7.15, 7.16 and 7.17, show the correlations between factor scores for each dimension of SERVTRUST for all three categories. The results indicated that all dimensions of SERVTRUST were positively related to one another. The significance level of each correlation led to the preliminary conclusion of acceptable nomological validity for the SERVTRUST scale.

Table 7.15

Inter-Construct Correlation of SERVTRUST Scale for Health Care Service Providers

	EXT	TIM	BEN	INT	CRE
EXT	1.00				
TIM	0.37**	1.00			
BEN	0.75**	0.50**	1.00		
INT	0.66**	0.42**	0.58**	1.00	
CRE	0.75**	0.40**	0.77**	0.72**	1.00

** t-value significance level at 0.01

Table 7.16

Inter-Construct Correlation of SERVTRUST Scale for Banking Service Providers

	EXT	TIM	BEN	INT	CRE
EXT	1.00				
TIM	0.61**	1.00			
BEN	0.55**	0.51**	1.00		
INT	0.70**	0.41**	0.65**	1.00	
CRE	0.63**	0.56**	0.75**	0.72**	1.00

** t-value significance level at 0.01

Table 7.17

Inter-Construct Correlation of SERVTRUST for Average Scale

	EXT	TIM	BEN	INT	CRE
EXT	1.00				
TIM	0.68**	1.00			
BEN	0.62**	0.74**	1.00		
INT	0.59**	0.57**	0.70**	1.00	
CRE	0.70**	0.73**	0.74**	0.60**	1.00

** t-value significance level at 0.01

Table 7.18

Conclusions from Testing Hypothesized Relationships among SERVTRUST and Its Antecedent and Consequent Constructs

Hypotheses	Hypothesized direction	Actual direction
H ₁ : Communication & SERVTRUST	+	+
H ₂ : Problem solving & SERVTRUST	+	+
H ₃ : Service quality & SERVTRUST	+	+
H ₄ : Satisfaction & SERVTRUST	+	+
H ₅ : SERVTRUST & Commitment	+	+
H ₆ : SERVTRUST & Loyalty	+	+

Table 7.18 shows the expected direction of the relationships among SERVTRUST and other constructs which support the theoretical framework. Four antecedents and two consequences were proposed to have a positive relationship with SERVTRUST for all three categories, health care services, banking services, and for

average. The hypotheses testing revealed and confirmed the relationships among constructs as expected. Overall, it can conclude that the SERVTRUST scale has nomological validity. This means that the SERVTRUST scale behaves as expected based on the theoretical issues in consumer marketing-service relationships. The discussion and implications of the scale will be presented in chapter 8.

Conclusion

This chapter presented the analyses of the structural models of SERVTRUST as proposed in chapter 4. Then, hypotheses testing and nomological validity of the scale were analyzed and presented. In SEM, all summated components of SERVTRUST were employed together with its antecedent and consequent latent constructs.

From the SEM analyses, it was found that all structural paths in the model were significant at $p < 0.05$, except for the path from service quality to SERVTRUST. Despite of the significance of chi-square value, the models had acceptable fit, based on other fit indices. For health care services, problem solving was the most influential factor on the level of trust or SERVTRUST, while satisfaction was the most influential factor for banking services.

In hypotheses testing, six main hypotheses were proposed as the relationships between SERVTRUST and its antecedent and consequent latent variables. The results showed that all hypothesized relationships were supported at $p < 0.05$ or $p < 0.01$, except the relationship between service quality and SERVTRUST.

For nomological validity testing, it was found that all dimensions of SERVTRUST had a significant positive relationship to one another. Moreover, the results confirmed that the relationships among constructs behaved as expected. Hence, it can be concluded that the SERVTRUST scale has nomological validity.