

Anoop K G “Service Quality and Post Service Behaviour of Customers’ of Kerala Gramin Bank.” Thesis. Research and PG Department of Commerce , St. Thomas’ College (Autonomous), Thrissur , University of Calicut, 2021.

## *Chapter 6*

# **The Linkage between the Service Quality and Post Service Behaviour of Customers in Kerala Gramin Bank**

<i>Contents</i>	6.1	<i>Introduction</i>
	6.2	<i>Objective of the chapter</i>
	6.3	<i>Co-variance based confirmatory factor analysis for the reliability and validity for the research instrument</i>
	6.4	<i>Co-variance based structural equation modeling</i>
	6.5	<i>Path analysis</i>
	6.6	<i>Results of path analysis and hypotheses testing</i>
	6.7	<i>Explanations of <math>R^2</math> values</i>
	6.8	<i>Conclusion</i>

### **6.1 Introduction**

The present chapter covers the third objective of the study to develop a Structural Equation Model for Kerala Gramin Bank, which links the service quality and customers' post service behaviour. This objective had achieved by testing Co-variance Based Confirmatory Factor Analysis (CB-CFA) and Structural Equation Modelling (SEM) techniques. This chapter involves two parts. Part one deals with Co-variance Based Confirmatory Factor Analysis (CB-CFA), and part two contains the Structural Equation Modelling (SEM) techniques. This chapter also contains an overview of SEM techniques. The summary of hypotheses testing also given at the end part of this chapter.

## **6.2 Objective of the chapter**

**Objective III:** To examine the linkage between service quality and post service behaviour of customers' of Kerala Gramin Bank.

To achieve this objective, Co-variance Based Confirmatory Factor Analysis (CB-CFA) and Structural Equation Modelling (SEM) techniques were employed with the help of IBM SPSS AMOS 21 software package

### **Part – A**

## **6.3 Co-variance based confirmatory factor analysis for the reliability and validity for the research instrument**

In statistics, confirmatory factor analysis is a special form of factor analysis, most commonly used in social research. It is used to test whether measures of a construct are consistent with a researcher's understanding of the nature of that construct. **Confirmatory factor analysis (CFA)** is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs. Confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) are similar techniques, but in exploratory factor analysis (EFA), data is simply explored and provides information about the numbers of factors required to represent the data. In exploratory factor analysis, all measured variables are related to every latent variable. But in confirmatory factor analysis (CFA), researchers can specify the number of factors required in the data and which measured variable is related to which latent variable. Confirmatory factor analysis (CFA) is a tool that is used to confirm or reject the measurement theory.

### 6.3.1 Assessment criteria of the CB-CFA models for final reliability and validity

It is necessary to establish Construct validity (convergent and discriminant validity) as well as reliability (Composite reliability) which doing Confirmatory factor analysis. Confirmatory factor analysis (CFA) is a statistical technique used to verify the factor structure of a set of observed variables. CFA allows the researcher to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists (Suhr, 2009). The factors have to demonstrate adequate validity and reliability. The following tools are employed for the assessment of the measurement model:

- (1) Composite Reliability (CR)
- (2) Construct validity
  - (a) Convergent Validity
  - (b) Discriminant Validity.

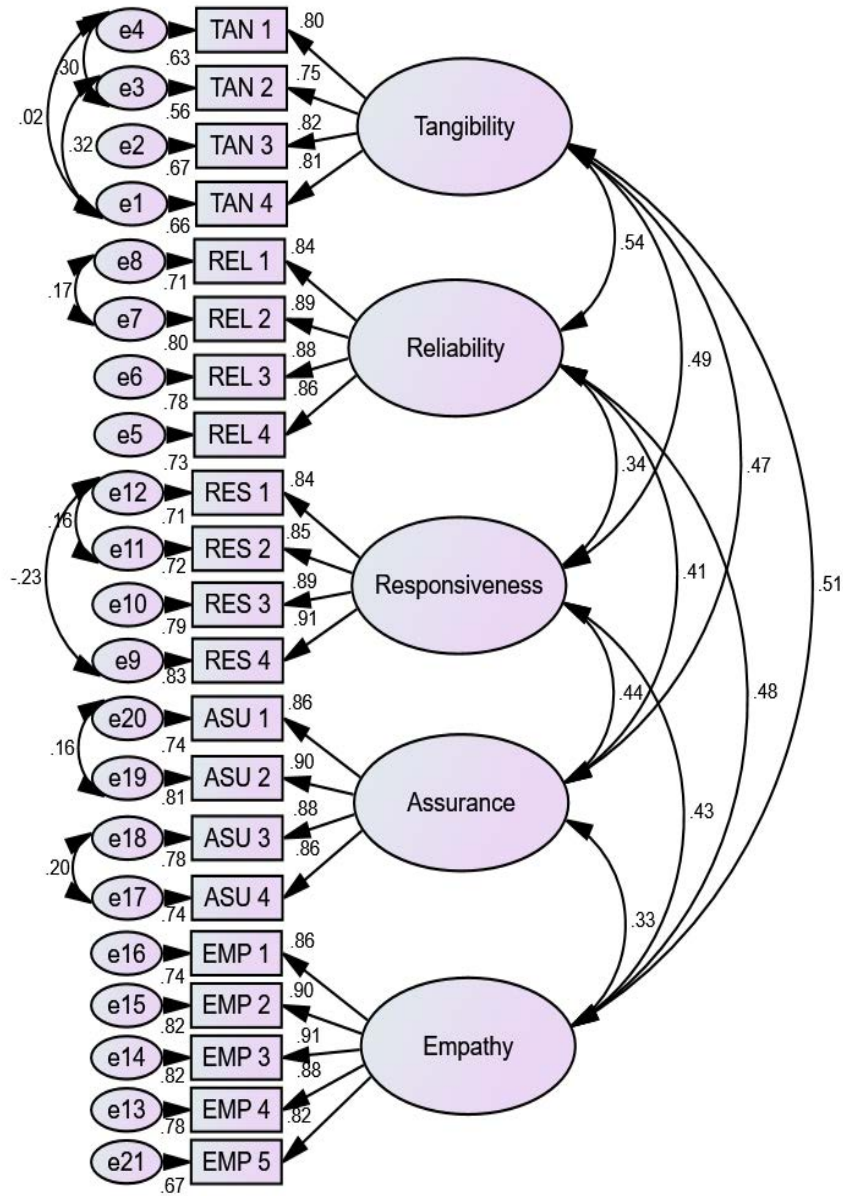
1. **Composite Reliability (CR)** – is a measure of the overall reliability of a construct. The value varies between 0 and 1. Values of composite reliability of >0.7 and above are good (Hair et al., 2010). Values less than 0.6 indicate lack of internal consistency.
2. **Construct validity:** construct validity can be measured by two methods that convergent validity and discriminant validity
  - (a) **Convergent Validity** – the items that are indicators or the observed variables in a specific construct should converge or share a high proportion of variance with each other. According to Hair et. al., (2010), if there are convergent validity issues in the validity examination, then it indicates that the latent factor is not well explained

by the observed variables. Malhotra et al (2001) observe that AVE is a strict measure of convergent validity even more conservative than CR. The researcher has used the average variance extracted (AVE) for measuring convergent validity for this study. The value of AVE is calculated by using standardized factor loadings. The threshold value of AVE is  $>0.5$  (Hair et. al., 2010). Item factor loadings are also a measure to identify convergent validity (Hair et. al., 2010). The threshold value of standardized factor loading for establishing item validity is  $>0.5$  for this study (Hair et. al., 2010). If the standardized factor loadings and AVE values are more than 0.5, it indicates adequate convergence.

(b) ***Discriminant validity*** is the extent to which a construct is truly distinct from other constructs. High discriminant validity indicates that a construct is unique and captures phenomena that are not represented by other constructs. If the discriminant validity examination does not yield the required results, it indicates that the variables correlate with variables of the other constructs to a large extent i.e. the latent variable is better explained by some other variables than by its own observed variables. The researcher has used the Fornell and Larcker (1981) criterion which is a conservative method of assessing discriminant validity. It compares the square root of AVE with the latent variable correlations. The square root of AVE of each construct should be greater than its latent variable correlation with any other constructs. By this, discriminant validity can be established.

### Confirmatory Factor Analysis for service quality factors of Kerala Gramin Bank

Figure 6.1: Confirmatory Factor Analysis for service quality factors of Kerala Gramin Bank



**Table 6.1: Model fit indices for service quality of Kerala Gramin Bank**

ATTRIBUTES	CMIN/DF	P-VALUE	GFI	AGFI	CFI	RMSEA
Study model	2.706	0.000	0.957	0.994	0.967	0.053
Recommended value	Acceptable fit [1-5]	Greater than 0.05	Greater than 0.9	Greater than 0.9	Greater than 0.9	Less than 0.08
Literature support	Hair et al., (1998)	Barrett (2007)	Hair et al. (2006)	Hair et al. (2006)	Hu and Bentler (1999)	Hair et al. (2006)

Table 6.1 represents the CFA model fit indices to assess the overall model fit. The value of Chi-Square to the degrees of freedom ratio for an acceptable model should be less than 5. In this case, the value is 2.706 which are very well within the suggested maximum value. The RMSEA score is 0.053, well below the accepted threshold score of 0.08. Moreover, the GFI and AGFI values are above 0.9 and CFI is above 0.9 for which 1.0 indicates exact fit. Thus, the model is a good fit and can be considered for further analysis.

**Table 6.2: Final Reliability and Validity of CFA Model for service quality of Kerala Gramin Bank**

Service quality of Kerala Gramin Bank Constructs	Item code	Factor loading	Cronbach's Alpha Final	AVE	Composite Reliability
<b>Tangibility (TAN)</b>	TAN 1	0.80**	0.89	0.63	0.87
	TAN 2	0.75**			
	TAN 3	0.82**			
	TAN 4	0.81**			
	REL 1	0.84**			
	REL 2	0.89**			

<b>Reliability (REL)</b>	REL 3	0.88**	0.92	0.76	0.92
	REL 4	0.86**			
<b>Responsiveness (RES)</b>	RES 1	0.84**	0.93	0.76	0.93
	RES 2	0.85**			
	RES 3	0.89**			
	RES 4	0.91**			
<b>Assurance (ASU)</b>	ASU 1	0.86**	0.93	0.77	0.93
	ASU 2	0.90**			
	ASU 3	0.88**			
	ASU 4	0.86**			
<b>Empathy (EMP)</b>	EMP 1	0.86**	0.94	0.77	0.94
	EMP 2	0.90**			
	EMP 3	0.91**			
	EMP 4	0.88**			
	EMP 5	0.82**			

Source: Primary data

\*\* denotes significant at 1% level

From Table 6.2 it can be inferred that all the factor loadings are above the threshold level of 0.5 which establishes the item validity of the constructs. The researcher has employed the Cronbach's Alpha reliability test after the full scale data collection. The final values of Cronbach's Alpha are found to be greater than 0.9 which confirms the reliability of the variables used to measure the construct. The Composite Reliability values are found to be greater than 0.9 which indicates that all the constructs have a high level of internal consistency reliability. The Average Variance Extracted (AVE) values are also found to be above the suggested threshold value of >0.5. Thus, it can be inferred that the all constructs have high levels of convergence. As all the



parameters meet the recommended value, the data is suitable for further analysis and model building.

**Table 6.3: Discriminant Validity for service quality of Kerala Gramin Bank constructs**

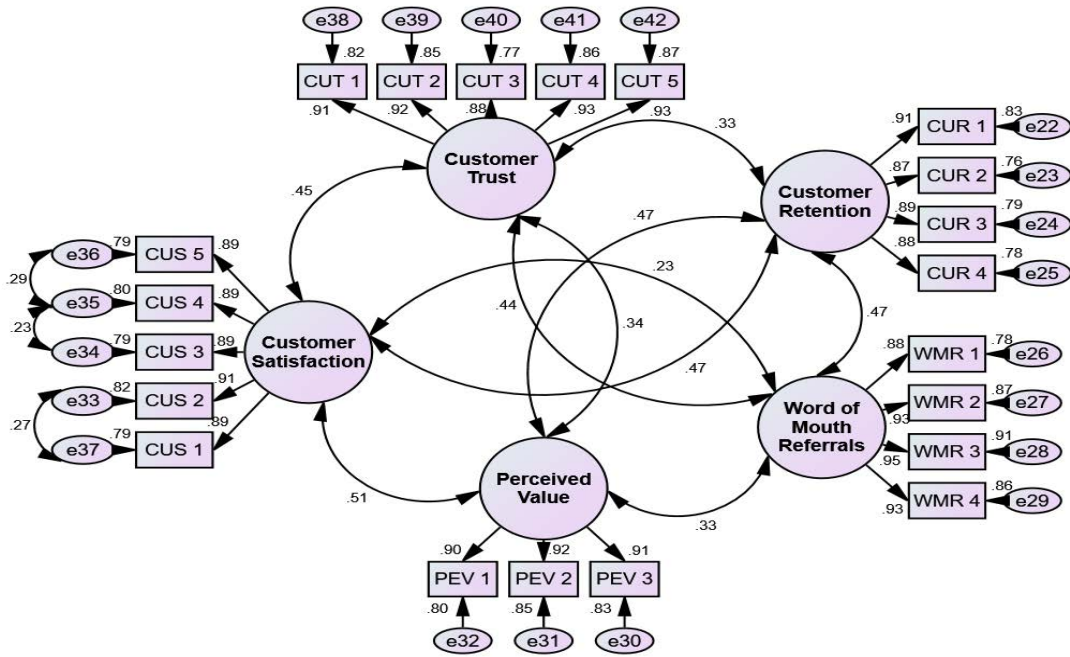
Constructs	TAN	REL	RES	ASU	EMP
TAN	<b>(0.79)</b>				
REL	0.54	<b>(0.87)</b>			
RES	0.49	0.34	<b>(0.87)</b>		
ASU	0.47	0.41	0.44	<b>(0.87)</b>	
EMP	0.51	0.48	0.43	0.33	<b>(0.88)</b>

Source: Primary data

Table 6.3 displays the square root of AVE values and inter construct latent constructs correlations. Values in brackets are the square root of AVE scores which must be greater than the inter construct latent variable correlation values to establish the non-existence of any relationship. From the above table, it can be observed that no relationship exists among the constructs and discriminant validity for service quality constructs is established.

**Confirmatory Factor Analysis for the factors of post service behaviour of customers**

**Figure 6.2: Confirmatory Factor Analysis for the factors of post service behaviour of customers**



**Table 6.4: Model fit indices for the factors of post service behaviour of customers**

ATTRIBUTES	CMIN/DF	P-VALUE	GFI	AGFI	CFI	RMSEA
Study model	2.329	0.000	0.989	0.945	0.988	0.075
Recommended value	Acceptable fit [1-5]	Greater than 0.05	Greater than 0.9	Greater than 0.9	Greater than 0.9	Less than 0.08
Literature support	Hair et al., (1998)	Barrett (2007)	Hair et al. (2006)	Hair et al. (2006)	Hu and Bentler (1999)	Hair et al. (2006)

Table 6.4 represents the CFA model fit indices to assess the overall model fit. The value of Chi-Square to the degrees of freedom ratio for an acceptable model should be less than 5. In this case, the value is 2.329 which are very well within the suggested maximum value. The RMSEA score is 0.075, well below the accepted threshold score of 0.08. Moreover, the GFI and AGFI values are above 0.9 and CFI is above 0.9 for which 1.0 indicates exact fit. Thus, the model is a good fit and can be considered for further analysis.

**Table 6.5: Final Reliability and Validity of CFA model for the factors of customers' post service behaviour**

Constructs of customers' post service behaviour	Item code	Factor loading	Cronbach's Alpha Final	AVE	Composite Reliability
<b>Customers' Trust (CUT)</b>	CUT 1	0.91**	0.96	0.83	0.96
	CUT 2	0.92**			
	CUT 3	0.88**			
	CUT 4	0.93**			
	CUT 5	0.93**			
<b>Perceived Value (PEV)</b>	PEV 1	0.90**	0.94	0.82	0.94
	PEV 2	0.92**			
	PEV 3	0.91**			
<b>Customer Satisfaction (CUS)</b>	CUS 1	0.89**	0.96	0.80	0.95
	CUS 2	0.91**			
	CUS 3	0.89**			
	CUS 4	0.89**			
	CUS 5	0.89**			
<b>Customer Retention (CUR)</b>	CUR 1	0.91**	0.94	0.79	0.94
	CUR 2	0.87**			
	CUR 3	0.89**			
	CUR 4	0.88**			
<b>Word of Mouth Referral (WMR)</b>	WMR 1	0.88**	0.96	0.86	0.96
	WMR 2	0.93**			
	WMR 3	0.95**			
	WMR 4	0.93**			

Source: Primary data

\*\* denotes significant at 1% level

From Table 6.5 it can be inferred that all the factor loadings are above the recommended cut-off level of 0.5 which establishes the item validity of the

constructs. The researcher has used the Cronbach's Alpha reliability test after the full data collection. The final values of Cronbach's Alpha are found to be higher than 0.8 which confirms the reliability of the variables used to measure the construct. The Composite Reliability values are found to be greater than 0.9 which indicates that all the constructs have high level of internal consistency reliability. The Average Variance Extracted (AVE) values are also found to be above the recommended cut-off value of >0.5. Thus, it can be inferred that the constructs have high levels of convergence. As all the criterions meet the prescribed value, the data is apt for further analysis and model building.

**Table 6.6: Discriminant Validity of the CFA model for the factors of customers' post service behaviour**

Constructs	CUT	PEV	CUS	CUR	WMR
CUT	<b>(0.91)</b>				
PEV	0.34	<b>(0.90)</b>			
CUS	0.45	0.51	<b>(0.89)</b>		
CUR	0.33	0.47	0.47	<b>(0.89)</b>	
WMR	0.44	0.33	0.23	0.47	<b>(0.93)</b>

Source: Primary data

Table 6.6 displays the square root of Average Variance Extracted values and inter construct latent variable correlations. Values in brackets are the square root of AVE scores which should be higher than the inter construct latent variable correlation values to establish non-existence of any relationship. From the above table, it can be observed that no relationship exists among the constructs and discriminant validity for the factors of customers' post service behaviour is established.

## Part– B

### 6.4 Co-variance based structural equation modeling

#### 6.4.1 Co-variance Based Structural Equation Modeling techniques

Structural equation modeling (SEM) is a multivariate statistical analysis technique that is used to analyze structural relationships. It is the combination of factor analysis and multiple regression analysis. Many researchers preferred this method because it estimates the multiple and interrelated dependence in a single analysis. In this analysis, mainly two types of variables are used, that is, endogenous variables (dependent variable) and exogenous variables (independent variable). Covariance Based Structural Equation Modelling is a confirmatory approach and is mainly used for hypotheses testing and for the analysis of a structural theory bearing on some phenomenon. In this study, IBM SPSS AMOS 21 software package was used to run the SEM.

This section deals with the development of a Structural Equation Model (SEM) for Kerala Gramin Bank which links the service quality and customers' post service behaviour. For this, the following hypotheses are to be tested.

**Table No. 6.7 The Hypotheses for model building**

Hypotheses No.	Hypotheses of model building
SM.H1	Service quality of Kerala Gramin bank has a positive effect on customers' trust
SM.H2	Service quality of Kerala Gramin bank has a positive effect on customer perceived value
SM.H3	Perceived value has a positive effect on customer satisfaction

SM.H4	Customers' trust has a positive effect on customer satisfaction
SM.H5	Customer satisfaction has a positive effect on customer retention
SM.H6	Customer satisfaction has a positive effect on Word of mouth referral

*SM.H1 to SM.H6 indicates Structural Model Hypotheses*

Figure 6.3: Hypothesized conceptual model for Kerala Gramin Bank which links the service quality and customers' post service behaviour

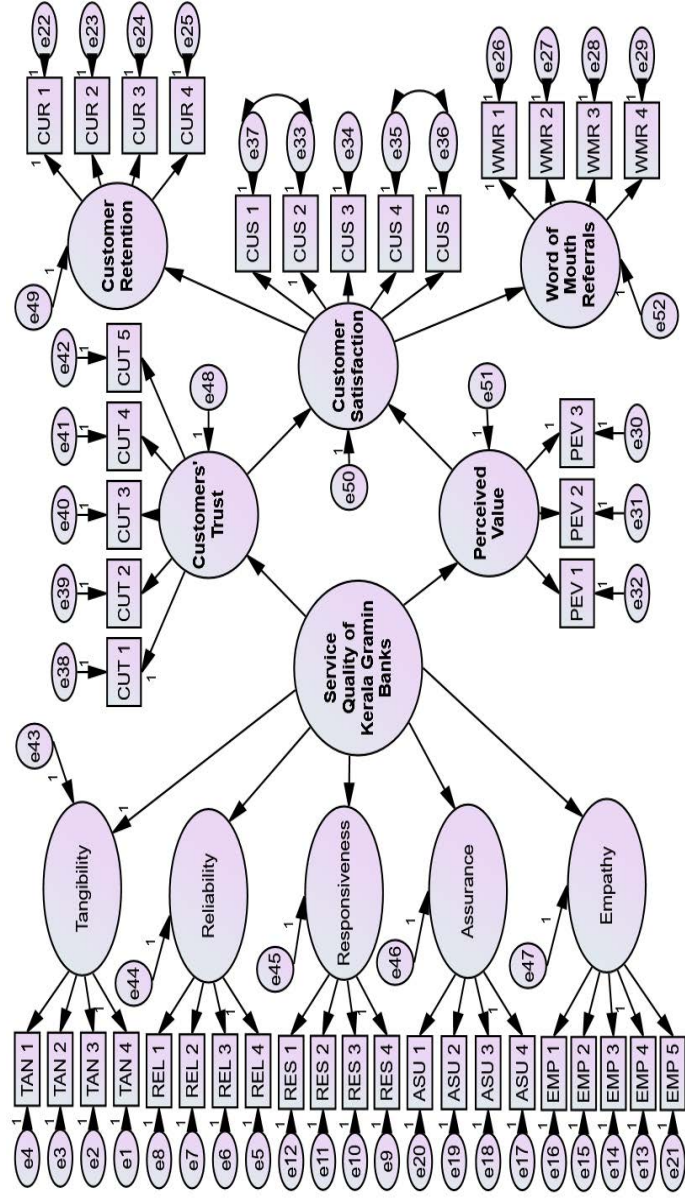
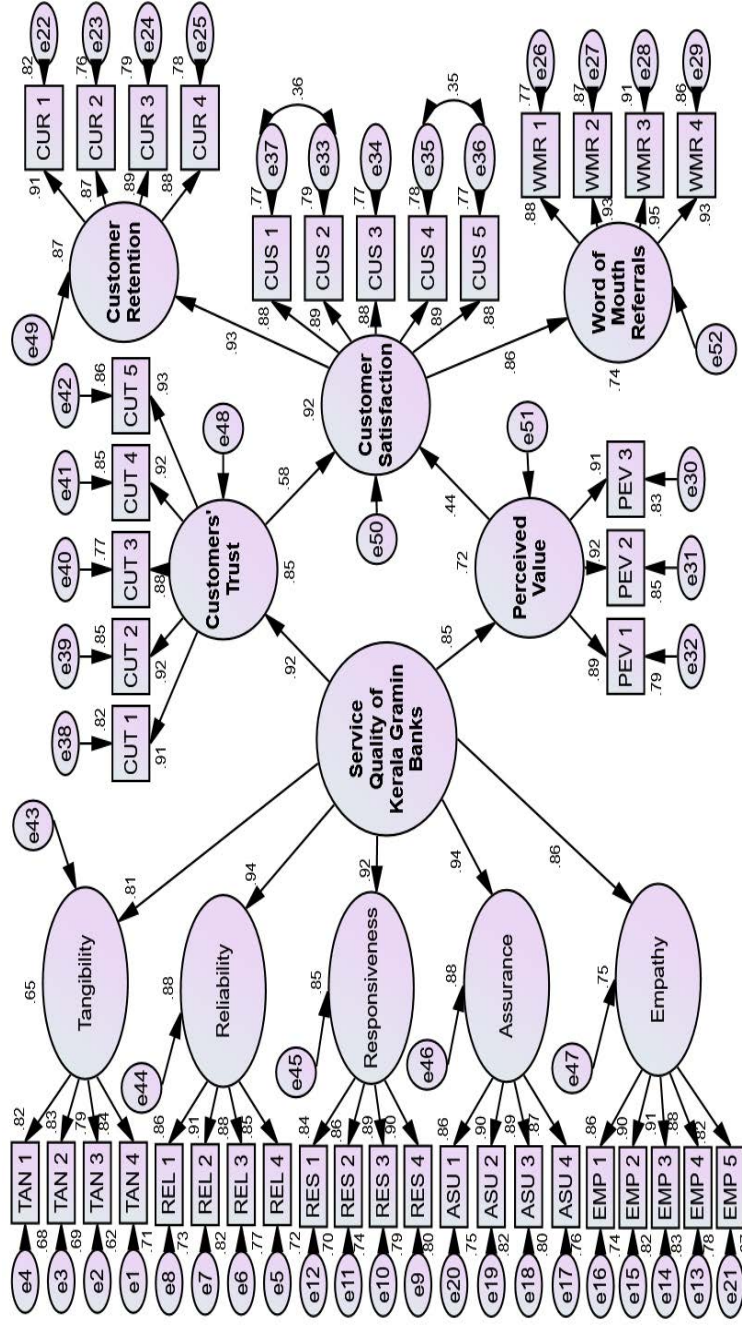


Figure 6.4: Structural Equation Model for Kerala Gramin Bank which links the service quality and customers' post service behaviour





**Table 6.8: Model fit indices for service quality and customers' post service behaviour model**

MODEL	CMIN/DF	P-VALUE	GFI	AGFI	CFI	RMSEA
Study model	3.125	0.000	0.927	0.902	0.947	0.063
Recommended value	Acceptable fit [1-5]	Greater than 0.05	Greater than 0.9	Greater than 0.9	Greater than 0.9	Less than 0.08

Table 6.8 represents the SEM model fit indices to assess the model fit. The value of Chi-Square to the degrees of freedom ratio for an acceptable model should be less than 5. In this case, the value is 3.125 which are very well within the suggested maximum value. The RMSEA score is 0.063, below the accepted threshold score of 0.08. Moreover, the GFI and AGFI values are above 0.9 and CFI is above 0.9 for which 1.0 indicates exact fit. Thus, the SEM model is a good fit.

### 6.5 Path analysis

**Table 6.9: Values of path analysis and R<sup>2</sup> for the SEM which links the service quality and customers' post service behaviour**

Constructs path index			Standardized co-efficient (Beta)	R <sup>2</sup> Value	Critical Ratio	P value
Customers' Trust	←	Service Quality of Gramin Bank	0.92	0.85	14.55	<0.001**
Perceived Value	←	Service Quality of Gramin Bank	0.85	0.72	13.50	<0.001**
Customer satisfaction	←	Customers' Trust	0.58	0.92	12.87	<0.001**
Customer satisfaction	←	Perceived Value	0.44		10.13	<0.001**
Customer Retention	←	Customer satisfaction	0.93	0.87	21.67	<0.001**
Word of Mouth Referral	←	Customer satisfaction	0.86	0.74	18.32	<0.001**

Source: Extracted from model

\*\* indicates significant at 1% level

## **6.6 Results of path analysis and hypotheses testing**

### ***SM.H1: Service quality of Kerala Gramin bank has a positive effect on customer trust***

The standardized beta coefficient of Service quality of Kerala Gramin bank on customer trust is 0.92 represents the partial effect of Service quality of Kerala Gramin bank on customer trust, holding the other path variables as constant. The estimated positive sign implies that such effect is positive and customer trust would increase by 0.92 for every unit of standard deviation increase in service quality of the bank and this coefficient value is significant at 1% level.

### ***SM.H2: Service quality of Kerala Gramin bank has a positive effect on customer perceived value***

The standardized beta coefficient of service quality of Kerala Gramin Bank on perceived value is 0.85 represents the partial effect of Service quality of Kerala Gramin bank on perceived value, holding the other path variables as constant. The estimated positive sign implies that such effect is positive and perceived value of Gramin bank customers would increase by 0.85 for every unit of standard deviation increase in Service quality of the Gramin bank and this coefficient value is significant at 1% level.

### ***SM.H3: Perceived value has a positive effect on customer satisfaction***

The standardized beta coefficient of perceived value on customer satisfaction is 0.44 represents the partial effect of perceived value on customer satisfaction, holding the other path variables as constant. The estimated positive value implies that such effect is positive and satisfaction of the bank customers would increase by 0.44 for every unit of standard deviation increase in perceived value and this coefficient value is significant at 1% level.

***SM.H4: Customers' trust has a positive effect on customer satisfaction***

The study depicts that the customers' trust has a positive effect on the customer satisfaction. The standardized beta coefficient of customer trust on customer satisfaction is 0.58 represents the partial effects of customers' trust on customer satisfaction, holding the other path variables as constant. The estimated positive value implies that such effect is positive and satisfaction of the customers would increase by 0.58 for every unit of standard deviation increase in customers' trust and this coefficient value is significant at 1% level.

***SM.H5: Customer satisfaction has a positive effect on customer retention***

The study reveals that the customer satisfaction has a positive effect on customer retention. The standardized beta coefficient of customer satisfaction on customer retention is 0.93 represents the partial effects of customer satisfaction on customer retention, holding the other path variables as constant. The estimated positive value implies that such effect is positive and the retention rate of the customers would increase by 0.93 for every unit of standard deviation increase in customer satisfaction and this coefficient value is significant at 1% level.

***SM.H6: Customer satisfaction has a positive effect on Word of mouth referral***

The study reveals that the customer satisfaction has a positive effect on word of mouth referral. The standardized beta coefficient of customer satisfaction on word of mouth referral is 0.86 represents the partial effects of customer satisfaction on word of mouth referral, holding the other path variables as constant. The estimated positive value implies that such effect is positive and the word of mouth referral of customers about Gramin bank

would increase by 0.86 for every unit of standard deviation increase in customer satisfaction and this coefficient value is significant at 1% level.

### **6.7 Explanations of R<sup>2</sup> values**

The explanatory power of the structural equation model is assessed by examining the R<sup>2</sup> value of the dependent variables. The R squared coefficient measures the percentage of variation that is explained by the model (See Model figure). The coefficient of determination for customers' trust, R<sup>2</sup> is 0.85. This value implies that about 85% of the variation in customers' trust is explained by service quality of Gramin bank. This value leads to the conclusion that other independent variables are necessary for predicting customers' trust besides this independent construct, service quality. The remaining 15% of the variation in customer trust is not explained by this independent construct.

The coefficient of determination for Perceived Value, R<sup>2</sup> is 0.72. This value implies that about 72% of the variation in perceived value is explained by service quality of Gramin bank. This value leads to the conclusion that other independent variables are necessary for predicting perceived value besides this independent construct, service quality. The remaining 28% of the variation in perceived value is not explained by this independent construct.

The coefficient of determination for customer satisfaction, R<sup>2</sup> is 0.92. This value implies that about 92% of the variation in customer satisfaction is explained by the customer trust and perceived value. This value leads to the conclusion that other independent variables are necessary for predicting customer satisfaction besides these independent constructs. The remaining 8% of the variation in customer satisfaction is not explained by these independent constructs.

The coefficient of determination for customer retention,  $R^2$  is 0.87. This value implies that about 87% of the variation in customer retention is explained by customer satisfaction. This value leads to the conclusion that there are other independent variables that are necessary for predicting customer retention besides this independent construct. The remaining 13% of the variation in customer retention is not explained by this independent construct.

The coefficient of determination for word of mouth referral,  $R^2$  is 0.74. This value implies that about 74% of the variation in word of mouth referral is explained by customer satisfaction. This value leads to the conclusion that there are other independent variables that are necessary for predicting word of mouth referral besides this independent construct. The remaining 26% of the variation in word of mouth referral is not explained by this independent construct.

**Table No. 6.10: Result summary of hypothesis testing**

Hypotheses No.	Hypotheses of the model developed	Result of Hypotheses testing
SM.H1	Service quality of Kerala Gramin bank has a positive effect on customer trust	<i>Supported</i>
SM.H2	Service quality of Kerala Gramin bank has a positive effect on customer perceived value	<i>Supported</i>
SM.H3	Perceived value has a positive effect on customer satisfaction	<i>Supported</i>
SM.H4	Customers' trust has a positive effect on customer satisfaction	<i>Supported</i>
SM.H5	Customer satisfaction has a positive effect on customer retention	<i>Supported</i>
SM.H6	Customer satisfaction has a positive effect on Word of mouth referral	<i>Supported</i>

*SM.H1 to SM.H6 indicates Structural Model Hypotheses*

## **6.8 Conclusion**

In the present chapter, six hypotheses are tested, and a model for Kerala Gramin Bank was developed based on the results of the hypotheses testing. All six hypotheses were supported in this model. The fit indices show that both all CFA and SEM models are a good fit. The customers' trust has a positive effect on the customer satisfaction and customer satisfaction has a positive effect on customer retention and word of mouth referrals.