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Customer Perception towards Public and Private Sector Banks: A Binary Logistic Regression Model Approach

KEYWORDS: banking, Private, Public, Logit, Service Quality

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ABSTRACT *Researchers have used various approaches and techniques to measure bank performance. In this paper the authors have made an attempt to categorize customers who prefer to bank either with the private sector or the public sector. Authors have applied binary logistic regression model to classify customers into two groups based on some predictor variables. The findings of the study demonstrate that the respondents could be categorized into two groups depending on their responses provided on eleven service attributes including servqual attributes. The fit of the model provides sufficient evidence to conclude that logistic regression model is quite effective in sorting customers into two groups with negligible error.*

Introduction

The study of customer satisfaction is a contemporary research topic among researchers pursuing research in the field of marketing including services rendered by the banking personnel. After the emergence of private sector banks in the Indian banking sector the public sector banks are under relentless pressure to retain their customers. In view of this the customer satisfaction has become an important issue and it is imperative to monitor continuously the service gaps by conducting periodic survey. It is to be noted that the banking sector has become highly competitive especially after the reforms initiated by the Government (Lindenmeier and Tscheulin, 2008). The most popular methods of measuring the quality of services was first introduced by Martilla and James (1977) which is popularly known as Importance-Performance Analysis (IPA Model). However, the most frequently cited model in the literature of marketing is the SERVQUAL model developed by Parasuraman et al. (1995). The model has been tested by a number of researchers to evaluate the reliability and validity of the twenty two item scale that captures the five important facets of service quality.

Review of Literature

The banking organizations are trying to becoming more customers oriented. The exact definition of customer oriented service quality is difficult due to diverse range of services offered by different firms. The concept of service quality has been operationalized by different researchers in a varied way incorporating a diverse constructs to capture the domain of the construct (Wisniewski, 2001). Service quality, in simple terms, may be conceptualized as the degree to which a particular service meets the customers'. needs by delivering the desired level of performance (Lewis and Mitchell, 1990; Wisniewski, 1996).A plethora of research findings in the field of service marketing depend on the path breaking article published by (Zeithaml et al. 1988; Zeithaml et al. 1990) who have extracted five dimensions of service quality namely Tangibility, Reliability, Responsiveness, Assurance and Empathy. They develop the SERVQUAL model based on service gap model. Numerous adaptations of the original SERVQUAL model have been investigated by researchers in various services sector.

As pointed by Lai & To (2010) IPA is an uncomplicated and constructive method for simultaneously considering the strengths and weaknesses of a business when appraising and adopting a strategy. Certain researchers have used IPA to study customer satisfaction to identify improvement opportunities and to guide strategic planning efforts (Shieh, Wu and Huang, 2010; Yavas & Shemwell, 2001). IPA has been used as a tool to evaluate service quality and marketing strategies in educational organizations (O'Neill & Palmer, 2004) and in health care systems (Miranda & Chamorro et al., 2012).

Quality is major part for survival of firms in present economy. The organizations are turning toward the customer focused approach. The exact definition of service quality is difficult due to different services offered by different firms. Service quality is a concept that has aroused considerable interest and debate in the research literature because of the difficulties in both defining it and measuring it with no overall consensus emerging on either (Wisniewski 2001). Patidar & Verma (2013) conducted a similar study of service quality of bank using the servqual methodology.

Objectives

The broad objectives of the study are as follows:

1. To find out the factors which are important in service delivery in the context of banking industry
2. To conduct a focus group interview to generate a pool of items
3. To establish the scale reliability
4. To employ a binary logistic regression model to categorize respondents based on the variables considered in our study

Methodology

The study was carried out covering 224 respondents who have accounts in private sector banks as well as public sector banks. The sample was drawn from respondents who were willing to take part in this study to provide their valuable judgments regarding the services offered by banks. The respondents were given a small gift (ATM card holder) for participating in this study.

It was our endeavor to include at least 250 respondents to take part in this study but 26 respondents did not eventu-

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ally participate in this study and as such, the sample size was reduced to 224 respondents which may be considered to be the ultimate sample size for analyzing the data obtained from them by administering standard structured questionnaire to provide answers to the objectives spelt out above. The data was gathered from the respondents having their accounts in private as well as public sector banks. Apart from 5 dimensions of servequal, we have included in our study a few more variables that are considered important by the respondents. In all, 11 dimensions have been considered by us to evaluate the quality of service rendered by banks. Since the data have been gathered for both the private as well as the public sector banks on the same set of variables, it is considered logical whether respondents can be categorized into two groups based on location, empathy, fast service and store loyalty. The first three variables are measured using dichotomous variables; 1 representing the private sector banks and 0 representing the public sector counterpart.

As we know in logistic regression, Logit (p) is the log (to base e) of the odd ratio or likelihood ratio that the dependent variable is 1. Symbolically,

Logit (p) = log [p/1-p] =ln [p/1-p]

The normal relationship of the logistic regression is,

Logit $[p(x)] = \log [p(x)/1-p(x)] = b_0+b_1x_1+b_2 x_{2+} b_3 x_3$.....

Results and Discussions

The reliability estimates have been presented in Table I. It can be observed from the reliability estimates that in spite of small number of items the reliability coefficients are quite acceptable. The results of reliability statistic have been presented in Table I. The reliability estimates are found to be quite satisfactory in view of very small number of items included in its scale. The demographic profile of respondents included in our study is presented in Table III. Adequate care was taken to draw respondents from various strata to represent the population as far as possible. To keep the questionnaire short, only a few demographic variables have been considered in this study. The demographic profile is presented in Table II.

Table-I Reliability Estimates

Item	α-Values
Tangibility(3)	.75
Reliability(3)	.79
Assurance(3)	.63
Responsiveness(4)	.70
Empathy(4)	.68
Product Assortment(3)	.71
Customer Orientation (4)	.76
Technology(5)	.79
Process(3)	.72
Card Management(3)	.69
Ease of Loan facility(3)	.64

Table II Demographics

Gender	**No**	**Percentages**
Male:	162	72
Female:	62	28
Age		
< 30 Years:	52	23
30-40 Years:	113	50
41-50 Years:	41	18
51+ Years:	18	09
Occupation		
Service:	51	23
Business:	95	43
Student:	21	09
Housewife:	12	05
Professional:	37	17
Others:	08	03
Income		
< ₹50000:	28	13
₹50001-75000:	55	24
₹75001-125000:	94	42
Above ₹125000:	47	21
Education		
Below Graduate:	19	08
Graduate:	152	68
Post Graduate:	53	24

The findings of binary logistic regression have been presented in Tables III-VII .Logistic regression is frequently used when there are only two categories of the dependent variable. Instead of using a least square deviation criterion for the best fit, logistic regression uses a Maximum Likelihood Estimation (MLE) method. The Cox and Snail R^2 attempts to duplicate multiple R^2 based on likelihood, but the maximum value can be >1, which is not easy to interpret. The Nagelkerke statistic ranges from 0 to 1 which is a measure of association and often termed as pseudo R^2.The overall significance is tested using chi square, which is derived from the likelihood of observing the actual data under the assumption that the model that has been fitted is accurate. There are two hypotheses to test in relation to the overall fit of the model:

H0 The model is not a good fitting model.
H1 The model is a good fitting model.

In the present case model chi square has 11 degrees of freedom, a value of 206.068 and a probability of p < 0.000. Thus, the indication is that the model has a good fit.

Table- III

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	Step	206.068	11	.000
	Block	206.068	11	.000
	Model	206.068	11	.000

Table IV

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	5.911	8	.657

Table- V Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	104.462[a]	.601	.802

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a. Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.
b. H-L Statistic is not significant that indicating the fit of the model.

Although there is no close analogous statistic in logistic regression to the coefficient of determination R^2, the Model Summary (Table-V) provides some approximations. Cox and Snell's R-Square attempts to imitate multiple R-Square based on 'likelihood', but its maximum can be (and usually is) less than 1.0 making it difficult to interpret. Here it is indicating that 60 percent of the variation in the depended variable is explained by the logistic model. The Nagelkerke modification that does range from 0 to 1 is a more consistent measure of the relationship. Nagelkerke's R^2 is normally higher than the Cox and Snell measure. Nagelkerke's R^2 is part of in the 'Model Summary' table and is the most-reported of the R-squared estimates. In our case it is 0.802, indicating a strong relationship of 80 percent between the predictors and the prediction.

Rather than using a goodness-of-fit statistic, one often wants to look at the proportion of cases classified correctly. In this study, 89.56 %(Table-VI) were correctly classified which acceptable by any standard.

The Variables in the Equation table (Table -VII) has several important elements. The Wald statistic and associated probabilities provide an index of the significance of each predictor in the equation. The Wald statistic has a chi-square distribution. The simplest way to assess Wald is to take the significance values and if less than .05 reject the null hypothesis as the variable does make a significant contribution In this case it can be observed that Tangibility, Responsiveness, Product Assortment, Process, Card Management and Loan facility contributed significantly to the prediction.

Table-VI Classification Table[a]

Observed			Predicted		
			Dummy		Percentage Correct
			.00	1.00	
Step 1	Dummy	.00	101	11	90.17
		1.00	13	99	88.39
	Overall Percentage				89.56
a. The cut value is .500					

Table-VII Variables in the equation

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Tangibility	2.266	.409	30.740	1	.000	9.643
Reliability	-1.196	.255	19..304	1	.000	4.822
Assurance	-.190	.109	3.056	1	.080	.827
Responsiveness	1.147	.269	18.129	1	.000	3.148
Empathy	.048	.072	.449	1	.503	1.050
Product Assortment	.575	.242	5.645	1	.018	.563
Customer Orientation	.291	.257	1.282	1	.258	1.338
Technology	.126	.080	2.499	1	.114	1.135
Process	525.	263	4.000	1	. 046	. 591
Card Management	.705	.242	8.510	1	.004	2.024
Loan	.077	.253	.093	1	.761	1.080

Conclusion

A logistic regression analysis was conducted to predict customer perception for 224 respondents using eleven predictor variables as reported above. The full model is found to be statistically significant, indicating that the predictors successfully distinguish between private customers and public sector bank customers. With regard to Tangibility, Responsiveness and Card Management private sector banks are doing better than their counterparts who are in the public sector whereas in terms of reliability public sector banks are at an advantageous position.

REFERENCE Lai, L. S., & To, W. M. (2010). Importance-performance analysis for public management decision making: an empirical study of China's Macao special administrative region. Management Decision, 48(2), 277-295. | Lewis, B. R., & Mitchell, V. W. (1990). Defining and measuring the quality of customer service. Marketing Intelligence & Planning, 8(6), 11-17. | Martilla, J., & James, J. (1977). Importance-Performance Analysis. Journal of Marketing (pre-1986), 41(000001), 77-79. | Miranda, F. J., Chamorro, A., Murillo, L. R., & Vega, J. (2012). Primary health care services quality in Spain: A formative measurement approach using PLS path modeling. International Journal of Quality and Service Sciences, 4(4), 387-398. | O'Neill, M. A., & Palmer, A. (2004). Importance-performance analysis: a useful tool for directing continuous quality improvement in higher education. Quality assurance in education, 12(1), 39-52. | Patidar, G. & Verma, D. S. (2013). Measurement of Service Quality Government Bank in Indore, Int. Journal of Engineering, Science, and Technology, 2 (4), 2477-2781 | Shieh, J. I., Wu, H. H., & Huang, K. K. (2010). A DEMATEL method in identifying key success factors of hospital service quality. Knowledge-Based Systems, 23(3), 277-282. | Wisniewski, M. (1996). Measuring service quality in the public sector: the potential for SERVQUAL. Total Quality Management, 7(4), 357-366. | Wisniewski, M. (2001). Using SERVQUAL to assess customer satisfaction with public sector services. Managing Service Quality, 11(6), 380-388. | Yavas, U., & Shemwell, D. J. (2001). Modified importance-performance analysis: an application to hospitals. International Journal of Health Care Quality Assurance, 14(3), 104-110. | Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1988). Communication and control processes in the delivery of service quality. The Journal of Marketing, 35-48. | Zeithaml, V.A, Parasuraman, A, Berry, L.L, 1990, Delivering Quality Service: Balancing Customer Perceptions and Expectations, The Free Press, New York, NY |