A Study on the Security Aspects of Various Alternate Channels of the Banks – Pilot Study Report

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Abstract

This Paper is summarising the Pilot study report conducted prior to the detailed study.

Key Words: Alternate channel banking, Perceived Risk, Branch Banking, e-banking services, banking services, Technology management in banks, Security aspects of banking services

1 Objectives

This research study focussing on the following research objectives:

1) To know the profile of alternate banking users.
2) To study the demographic characteristics of respondents and consumer self-confidents dimensions
3) To study the demographic characteristics of respondents and perceived risk dimensions
4) To scrutinize the impact of demographic and rational factors of consumer self-confidents and perceived risk dimensions.
5) To analyze and rank the level of perceived risk in the various alternate banking channels
6) To evaluate the perceived risk dimensions in alternate banking channels
7) To offer valuable suggestion based on findings for the effective managerial implications

2 Statement of the problem

The fact is globally Banks are facing a major change, in terms of providing their services to their customers like going for Core-banking-solution, installing more number of ATM, introducing Internet Banking and more channels by investing few millions. We see from the analyst point of view, many Banks are forced to take up more initiatives on implementing as much of alternative channels as possible by various factors like the regulatory and the demand from the customers. On the other hand, there are so many factors influencing the banks to be more cautious on their decision considering the risk(s) and the threat(s) like Hacking, Phishing, Virus and more… which creates resistance amongst the users who are supposed to use the channel. Hence Banks are in urgent need to provide the solutions to the users, which is the Main objective of this Study.

3 Pilot study

3.1. Reliability Statistics for measuring customer perception of alternate channels in banking industry

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.974</td>
<td>176</td>
</tr>
</tbody>
</table>
Cronbach’s alpha test used to measure the reliability of the instrument being used to get the response from the respondents. Above test refers that reliability of the overall measurement of perception of alternate channel among the respondents. One hundred and seventy six functional variables apart from the demographic variables used to measure the reliability. Minimum reliability for the instrument is required about .6 to .8 for attaining minimum reliability. This study is having 0.974 alpha (ie., 97.4% of reliability) values. It infers that this instrument attained good standards reliability.

3.2. Internal validity for measuring customer perception of alternate channels in banking industry

ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between People</td>
<td>2849.991</td>
<td>94</td>
<td>30.319</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within People</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Items</td>
<td>989.189</td>
<td>175</td>
<td>5.653</td>
<td>7.143</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>13017.294</td>
<td>16450</td>
<td>.791</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14006.483</td>
<td>16625</td>
<td>.842</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16856.474</td>
<td>16719</td>
<td>1.008</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grand Mean = 2.47

The above table depicts the internal validity of the instrument. F-test used to test the internal ability of the instrument is valid for measuring the variable. P value for the F-test is below the 0.05. It infers that variables having significant relationship for measuring customer perception of alternate channels.

3.3. Sample size determination

Nature of universe: basically universe for this study is heterogeneous in nature. People those who are using alternate channels is infinite in nature.

Number of classes proposed: this study measures the usage and acceptance of alternate channels among bank customers. Both public and private sector bank customers were the respondents for this study. In public sector bank top two banks were selected based on its global ranking and top two private sector banks also selected. So, these four classes of customers are classified based on their most preferred banks. These six class of banks also having sub-groups based on demographic variables.

Sample size calculation:
Sampling error can be controlled by selecting adequate size. Researcher specified the precision for that wants in respect of estimation concerning the population parameter. In this case researcher desired precision is ± 5 i.e. the true values mean not less than 95%. Researcher accepts that the acceptable rate of error (e) is equal to 5%.

Researcher uses the following formula for deciding the required sample size for this study.

\[ n = \frac{z^2 \times \sigma_p^2}{e^2} \]

Here,

\[ n = \text{size of the sample} \]
\[ z = \text{the value of standard variate at a given confidence level. Here the confidence level is 95% and assumed to be a normal distribution. So, the table value under normal curve is 1.96.} \]
\[ e = \text{acceptable error} \]
\[ \sigma_p = \text{Standard deviation of the population calculated by taking functional variables for the choice of alternate channel of the respondents.} \]
Hence, it is found that 0.623 is the value of standard deviation for the choice of alternate channel. 
\[ n = (1.96)^2 \times (.623)^2 / (5)^2 \]
\[ n = 597.5 \]

Researcher decides to collect 600 samples for this study.

3.4. Scope

The present study was a confirmatory study of William O. Bearden et al. model of perceived risk scales for Indian banking brands. An exploratory study is required to identify the dimensions of perceived risk in alternate banking channels. Hence, future researchers can undertake identifying the Indian perceived risk construct. Also, this research tried to identify the perceived risk only for the financial brands in India, which implies that researchers can identify perceived risk for alternate banking channels. This research was conducted major cities in Tamil Nadu, which implies that future studies can be conducted in other parts of India by replicating the model obtained from the study. The understanding of perceived risk dimensions of alternate banking channels will help Banking companies to develop Brand Positioning strategies, to introduce new variants for the schemes and to extend the brand to other categories. The analysis of whether there is any link between perceived risk items will also help in reducing customer grievances conducted by the banks. The impact of consumer self-confidence on perceived risk dimensions for alternate banking channels will also be useful for other financial services players.

3.6. Methodology

3.6.1. Introduction

This chapter discusses in detail the methodology adopted in this study of the influence the perception of bank customers towards services and risk aspects in alternate channels. This chapter discusses research design used in this study, sampling and selection for the study, and the variables used for the study, tools used for analysis and the proposed models for the study.

3.6.2. Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that are that aims to combine relevance to the research purpose with economy in procedure.

The research design is the conceptual structure within which research is conducted; It constitutes the blueprint for the collection, measurement and analysis of data. Since the research problem is well defined and an attempt is made to describe the existing phenomena relating to various security aspects of banks, this research well fits into empirical research design. **Empirical research** is a way of gaining knowledge by means of direct and indirect observation or experience. Empirical evidence (the record of one's direct observations or experiences) can be analyzed quantitatively or qualitatively. Through quantifying the evidence or making sense of it in qualitative form, a researcher can answer empirical questions, which should be clearly defined and answerable with the evidence collected (usually called data). Research design varies by field and by the question being investigated.
3.6.3 Theoretical model for measuring customer perception towards alternate banking services

**Demographic variables**
- Age
- Gender
- Marital status
- Education qualification
- Occupation
- Family type
- Income

**Customer Risk Perception on Security Aspects**
- Financial risk
- Performance risk
- Time risk
- Social risk
- Psychological risk
- Security risk

**Self-confidence Dimensions**
- Information acquisition
- Personal outcome decision making
- Social outcome decision making
- Persuasion knowledge

**Customer choice of alternate banking**

**Channel choices**
- Purpose of branch banking
- Problems in branch banking
- Usage level of alternate banking

**E-Loyalty**
- Trust
- Top of the mind
- Repetitive purchase

**Customer transaction decision with alternate channel**
3.6.4. Data collection:

The primary data are collected from the sample size of 600 Respondents living in Chennai, Coimbatore, Madurai, Trichy and Salam. The questionnaires were left with the respondents and given sufficient time to fill up. The data are collected from the period of September 2012 to January 2013.

Well-structured questionnaire used to collect responds from the respondents. Both demographic and functional variable were presented in the questionnaire as three part: Profile of the Respondent, Branch Banking and Alternate Channel Banking. First part contains Demographic variables include eight questions. Second and third part contains Functional variables viz., questions from customer awareness, E-Servqual, E-Loyalty and perceived risk. Functional Variables include one hundred and fifty questions. Out of which eleven questions asked from branch banking, one about frequency of using alternate channel banking services, seven questions from customer awareness, thirty questions from E-Servqual, nineteen questions from E-Loyalty and one hundred and two questions from perceived risk.

Secondary data collected for the purpose of constructing research problem, measurement of variables using various techniques, literature reviews and framing methodology. Secondary data collected from websites, journals, and some published sources.

3.6.5. Sampling design:

Sampling design is a design, or a working plan, that specifies the population frame, sample size, sample selection, and estimation method in detail. Objective of the sampling design is to know the characteristic of the population.

3.6.5.1 Type of universe: This study is having the nature of infinite population. It is not ease to estimate the customers of banks in Tamilnadu. Apart from official source of information no more information which is not available about the banking customers in each city.

3.6.5.2 Sampling unit: Researcher has selected five major and old corporations in Tamilnadu viz., Chennai, Coimbatore, Madurai, Trichy and Salam. Survey for this present research has taken from these cities.

3.6.5.3 Source of data: data for this research study has collected from the respondents after completing their transactions in ATMs (Automatic Teller Machines) in these cities. Because ATM is the only alternate channel available for public freely as well as most of the same bank customers are available.

3.6.5.4 Selection of banks

Banks are selected on the basis of brand value and its global ranking. Top two public sector and private sector banks are taken for this bank.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the bank</th>
<th>Brand value (Million USD)</th>
<th>Global ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Sector Banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SBI</td>
<td>4687</td>
<td>39</td>
</tr>
<tr>
<td>2</td>
<td>Bank of Baroda</td>
<td>675</td>
<td>166</td>
</tr>
<tr>
<td></td>
<td>Private Sector Banks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>ICICI Bank</td>
<td>1495</td>
<td>102</td>
</tr>
<tr>
<td>2</td>
<td>Axis Bank</td>
<td>657</td>
<td>168</td>
</tr>
</tbody>
</table>

Source: Brand Finance 2012: Global top 500 banking brands
3.6.5.5 Sampling plan

Sampling plan for this has given below:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Area</th>
<th>Bank</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chennai</td>
<td>State Bank of India</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Bank of Baroda</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>ICICI Bank</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Axis Bank</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>Coimbatore</td>
<td>State Bank of India</td>
<td>30</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Bank of Baroda</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>ICICI Bank</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Axis Bank</td>
<td>30</td>
</tr>
<tr>
<td>9</td>
<td>Madurai</td>
<td>State Bank of India</td>
<td>30</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Bank of Baroda</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>ICICI Bank</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Axis Bank</td>
<td>30</td>
</tr>
<tr>
<td>13</td>
<td>Trichy</td>
<td>State Bank of India</td>
<td>30</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>Bank of Baroda</td>
<td>30</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>ICICI Bank</td>
<td>30</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>Axis Bank</td>
<td>30</td>
</tr>
<tr>
<td>17</td>
<td>Salem</td>
<td>State Bank of India</td>
<td>30</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>Bank of Baroda</td>
<td>30</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>ICICI Bank</td>
<td>30</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>Axis Bank</td>
<td>30</td>
</tr>
</tbody>
</table>

**Total sample size** 600

3.6.5.6 Sampling Technique

Initial phase of this research focused on the selection of major cities in Tamilnadu. For this purpose researcher used area sampling to determine location for survey. A method in which an area to be sampled is sub-divided into smaller blocks that are then selected at random and then again sub-sampled or fully surveyed. This method is typically used when a complete frame of reference is not available to be used.

Second phase of the research focussed on convenient sampling. convenience sampling (sometimes known as Accidental sampling) is a type of non-probability sampling which involves the sample being drawn from that part of the population which is close to hand and convenient to the researcher to make enquiry about the research problem. Sample population selected because it is readily available and convenient. The researcher using such a sample, it cannot scientifically make generalizations about the total population from this sample because it would not be representative enough.

3.7. Method of Analysis:

3.7.1 Analysis of Variance:

One way Analysis of Variance was applied to identify if there is any variation between influencers of high involvement and low involvement factors which influencing security aspects of banks.
3.7.2 Two way tables

When analysis of categorical data is concerned with more than one variable, two-way tables (also known as contingency tables) are employed. These tables provide a foundation for statistical inference, where statistical tests question the relationship between the variables on the basis of the data observed.

3.7.3 Chi -square test

Chi square test was administered to find out if there is any association between demographic variables in terms of their perception towards security aspects of banks.

3.7.4 Pearsons Correlation technique

Persons Correlation technique was used to identify various security aspects of banks.

3.7.5 Multiple Regression analysis & AMOS (Analysis of Movement of Structure)

Regression analysis was used to formulate a model for predicting various aspects of perception of services and risk associates with the public sector and private sector banks. Within the framework of job choice dimensions are number of variables which are having the scope studying its awareness, loyalty, service quality and perceived risk.

Using the regression model it was proposed to construct a model. The general regression model ( linear) is of the type:

\[ Y = a + b_1X_1 + b_2X_2 + \ldots + b_{15}X_{15} \]

Where \( y \) is the dependent variable and \( X_1, X_2, \ldots, X_{15} \) are the independent variables expected to be related to \( y \) and expected to explain or predict \( y \). \( b_1, b_2, b_3, \ldots, b_{15} \) are the coefficients of the respective independent variables, which will be determined from the input data.

3.7.6 Cluster Analysis

Cluster analysis is a multivariate statistical technique which groups unknown number of persons / objects / occasions into groups such that the members of each group are having similar characteristics / attributes. The primary objective of Cluster Analysis is to define the structure of the data and identifying the most similar observations to place them into groups. The different groups to be determined in Cluster Analysis are not pre – defined as in Discriminant Analysis. This analysis is ideally suited for segmentation applications in management research like studying using of alternative channel of banking service. The method of clustering may be either hierarchical or non-hierarchical or both. The outcome of this analysis is much superior when the results from the hierarchical order are used for the analysis along with the non- hierarchical. Thus hierarchical and non- hierarchical techniques should be viewed as complementary clustering techniques rather than as competing techniques.
3.7.7 ANOVA

To study which of the variables is statistically significant across the clusters result of Cluster analysis, ANOVA was employed.

3.7.8 Garrett’s ranking technique

To find out the most significant factor which influences the respondent, Garrett’s ranking technique was used. As per this method, respondents have been asked to assign the rank for all factors and the outcome of such ranking have been converted into score value with the help of the following formula:

Percent position = \[ \frac{100 (R_{ij} – 0.5)}{N_j} \]

Where

- \( R_{ij} \) = Rank given for the \( i \)th variable by \( j \)th respondents
- \( N_j \) = Number of variable ranked by \( j \)th respondents

With the help of Garrett’s Table, the percent position estimated is converted into scores. Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor.

3.7.9 Factor Analysis

Factor analysis is a statistical method used to describe variability among observed, correlated variables in terms of a potentially lower number of unobserved variables called factors. For example, it is possible that variations in four observed variables mainly reflect the variations in two unobserved variables. Factor analysis searches for such joint variations in response to unobserved latent variables. The observed variables are modelled as linear combinations of the potential factors, plus "error" terms. The information gained about the interdependencies between observed variables can be used later to reduce the set of variables in a dataset. Computationally this technique is equivalent to low rank approximation of the matrix of observed variables. Factor analysis originated in psychometrics, and is used in behavioral sciences, social sciences, marketing, product management, operations research, and other applied sciences that deal with large quantities of data.

Factor analysis is related to principal component analysis (PCA), but the two are not identical. Latent variable models, including factor analysis, use regression modelling techniques to test hypotheses producing error terms, while PCA is a descriptive statistical technique.[1] There has been significant controversy in the field over the equivalence or otherwise of the two techniques.

3.7.10 Component Matrix & Rotated Component Matrix

If there are two or more components in the component matrix, the pattern of loadings is based on the SPSS Rotated Component Matrix. If there is only one component in the solution, the Rotated Component Matrix is not computed, and the pattern of loadings is based on the Component Matrix.

3.7.11 SEM (Structural Equation Modeling)

Structural Equation Modeling is a very general statistical modeling technique, which is widely used in the behavioural sciences. It can be viewed as a combination of factor analysis and regression or path analysis. The interest in SEM is often on theoretical constructs, which are represented by the latent factors. The relationships between the theoretical constructs are represented...
by regression or path coefficients between the factors. The structural equation model implies a structure for the covariances between the observed variables, which provides the alternative name covariance structure modeling. However, the model can be extended to include means of observed variables or factors in the model, which makes covariance structure modeling a less accurate name.

Structural Equation Modeling provides a convenient framework for statistical analysis that includes several traditional multivariate procedures, for example factor analysis, regression analysis, discriminant analysis, and canonical correlation, as special cases. Structural equation models are often visualized by a graphical path diagram. The statistical model is usually represented in a set of matrix equations.

### 3.7.12 COVARIANCES

Covariance is a measure of how much two random variables change together. If the greater values of one variable mainly correspond with the greater values of the other variable, and the same holds for the smaller values, i.e., the variables tend to show similar behavior, the covariance is positive.[1] In the opposite case, when the greater values of one variable mainly correspond to the smaller values of the other, i.e., the variables tend to show opposite behavior, the covariance is negative. The sign of the covariance therefore shows the tendency in the linear relationship between the variables. The magnitude of the covariance is not easy to interpret. The normalized version of the covariance, the correlation coefficient, however, shows by its magnitude the strength of the linear relation.

A distinction must be made between

1. The covariance of two random variables, which is a population parameter that can be seen as a property of the joint probability distribution, and
2. The sample covariance, which serves as an estimated value of the parameter.

### 3.8 Limitations

Although utmost care has been taken to ensure that the data collected and the analysis done with good reliability and consistency is of highest standard and free from all bias using the approved methodology & tools, yet it suffers from the following limitations:

1. Sample Size is limited to 600
2. Lack of available secondary data to use along with the primary data collected by source of questionnaire for various analysis
3. Lack of prior research on the Alternate distribution channel of banking services in the aspect of perceived risk, however there are few with respect to specific channel like internet banking but not covering all the channels which is the Gap identified by the researcher
4. Data collection was limited to selected top two bank customers from Public sector and Private sector separately based on their global ranking
5. The Study cannot be generalized to major cities in India, because the findings of alternate banking channels were based on the responses given by consumers living in major cities in Tamilnadu viz., Chennai, Coimbatore, Madurai, Trichy and Salem.
6. This research tried to identify the perceived risk for the alternate channels, which were in the top in India, which implies that researchers can identify perceived risk for other banking services, and other financial services.
7. This research covers only ATM, credit card, debit card, phone banking, internet banking & mobile banking channels.

However, notwithstanding the limitations indicated above, the study has been carried out objectively maintaining the ethics of social survey & research. There are lot of future scope for doing a research on wider basis as per the below proposal.
3.9 Proposal for Future Research:

As mentioned in the Limitations, a series of studies were proposed as below:

1. Future research must focus on a wider sample in order to get more generalized results.
2. The present data can be served as secondary data for any suitable new study in case if they need this for any required analysis.
3. A detailed study with any specific channel and the risk associated to each and every individual channel with respect to the available gaps out of the earlier studies available can be carried.
4. An indepth study can be carried out separately with handful of respondents from either Public sector banks or Private sector banks to be more precise and focused results.
5. A wider research can be done for various other cities in Tamilnadu or India or on international basis.
6. Researcher can identify perceived risk for other banking services like door step banking, cash pickup services... or any other financial services
7. Future research can be conducted for any new channel rolled out by various banks across the globe like the Smart Phone Applications and Social Media like Facebook, Twitter and LinkedIn,… or any more to add in near future.

4. Conclusion

This pilot study proved that there is 97% reliability on the instrument and the variables selected for the detailed study. A detailed report will be provided based on the huge data collected and a wider range of statistical tools will be applied to attain a precise result.

5. Reference

5. R. Vijesh, Dr. N. Panchanatham & Mr. V. Vijayanand (2012) "Management by equality-work life balance" "Integral Management - Edited by Rohit Puri" ISBN: 978-81-923275-3-2, pp142-173

