

## **Analysis of customers' assessment of various risk dimensions that influence the usage of internet banking: with special reference to Navi Mumbai region of Thane District, Maharashtra**

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### **Abstract**

Internet banking has become the self service delivery channel that allows banks to provide information and offer services to their customers with more convenience via the web services technology. This study attempts to analyze various risk dimensions that influence the usage of Internet Banking. Data from approximately 300 respondents were collected using the survey research instrument questionnaire. The respondents were asked to indicate their degree of agreement with 5 point Likert Scale. Data were classified, tabulated and tested by the use of SPSS(Statistical Package for Social Sciences) software. Factor analysis has been used as a research tool for checking the reliability of the theory.

### **Introduction**

Internet Banking provides opportunities for the bank to develop its market by attracting a new customer base from existing internet users. Internet banking allows customers to perform their banking transactions through the bank's website hosted on the internet. In spite of the great benefits of the online banking, it is extremely essential that banks regard the risks associated with it. One significant step that banks must take before going through any transformation is to insure the proper handling of online banking risk (Al-Alawi, 2004). A particular risk arises with trying to integrate new channels with existing channels (Aljlfri et. al., 2003). In India, slowly but steadily, the Indian customer is moving towards Internet banking. But they are very concern about security and privacy of internet banking (Malhotra and Singh, 2009). Karake Shalhoub (2002a and 2006b) has studied a number of US-based pure play firms to determine what she labeled trust enhancers. Her findings identified two main categories: privacy and security as the main determinants of trust in electronic commerce. Privacy has long been defined as the right of a person to be left alone and to be able to have control over the flow and disclosure of information about him or herself (Warren and Brandeis, 1890).The objective of the study is to analyze various risk dimensions that influence the usage of Internet Banking.

### **Literature Review:**

In the recent years there has been explosion of Internet based electronic banking applications (Liao & Cheung, 2003). Beckett, Hower & Howcroft (2000) states that the emergence of new forms of technology has created highly competitive market conditions for bank providers. However, the changed market conditions demand for banks to better understanding of consumers' needs. The concept of electronic banking has been defined in many ways (e.g. Daniel, 1999).According to Karjaluoto (2002) electronic banking is a construct that consists of several distribution channels. Akhlaq & Shah, (2011) investigate and find out the complexities or factors that resist the customers to adopt

internet banking in Pakistan. Liao et al. (2003) suggest that consumer perceptions of transaction security, transaction accuracy, user friendliness, and network speed are the critical factors for success in Internet banking.

## **Research Methodology**

### **Research Design**

Literature survey is carried out for collection of secondary information. Literature review is followed by a descriptive research design in order to understand the problem and carry out research in lucid manner.

### **Sampling Procedure**

The target population of the research was Internet Banking Users of Navi Mumbai region of Thane district, Maharashtra. Sample is selected on the basis of stratified random sampling. Understanding of questionnaire was easy to them as they were familiar with the internet and quite clear about the reasons they use it and various problems they face.

### **Sample size**

Approximately 300 Internet Banking Users within various regions of Navi Mumbai.

### **Factor Analysis**

Variables to be included in the factor analysis are based on the theory of the risk factors that influence the usage of internet banking. The respondents were asked to indicate their degree of agreement with a 5 point Likert Scale.(1=Strongly disagree, 7=Strongly agree)

### **Variables**

- V1: Unsafe to provide personal information.
- V2: Unauthorized access to Internet banking account.
- V3: Unsecure for sending sensitive information over Internet Banking.
- V4: Fraud or hacking to Internet banking account.
- V5: Breakdown of server.
- V6: No assurance of getting compensation if any error occurs.
- V7: Fear to lose money through Internet Banking.
- V8: Transfer of money to wrong account.
- V9: No rollback of transaction.
- V10: Incorrect processing of payments by Internet banking servers.
- V11: Discontinuity in power supply during the transaction.
- V12: Internet banking servers may not perform well due to low speed.
- V13: Quality of Internet Service.
- V14: Discontinuity of internet connection during the transaction.
- V15: Time wasted in error correction.
- V16: Time required learning Internet Banking Services.
- V17: Time required for a transaction

### **Bartlett's test of sphericity**

H0: The variables are uncorrelated in the population.

H1: The variables are correlated in the population.

The test statistic for sphericity is based on a chi-square transformation of the determinant of the correlation matrix. A large value of test statistic is favoring the rejection of the null hypothesis. So factor analysis is appropriate.

**Kaiser-Meyer-Olkin(KMO)**

|   |                    |         |
|---|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy |                    | 0.602   |
| Bartlett's Test of Sphericity                   | Approx. Chi-square | 435.172 |
|   | df                 | 136     |
|   | Significance       | 0.000   |

Here KMO=0.602(Value should be greater than 0.5), which is high, so the KMO statistic indicate that the correlations between pairs of variables can be explained by other variables and that factor analysis may be appropriate.

**Method of Factor Analysis [Principal Component Analysis]**

The approach used to derive the weights or factor score coefficients differentiates the various methods of factor analysis. The two basic approaches are principal component analysis and common factor analysis. Here primary concern is to find out minimum number of factors that will account for maximum variance. The factors are called

| Component | Initial Eigenvalues |                        |                       | Extraction Sums of Squared Loadings |                        |                       |
|-----------|---------------------|------------------------|-----------------------|-------------------------------------|------------------------|-----------------------|
|           | Total               | Percentage of Variance | Cumulative Percentage | Total                               | Percentage of Variance | Cumulative Percentage |
| 1         | 6.241               | 36.712                 | 36.712                | 6.241                               | 36.712                 | 36.712                |
| 2         | 3.978               | 23.399                 | 60.110                | 3.978                               | 23.399                 | 60.110                |
| 3         | 2.411               | 14.184                 | 74.294                | 2.411                               | 14.184                 | 74.294                |
| 4         | 2.079               | 12.228                 | 86.522                | 2.079                               | 12.228                 | 86.522                |
| 5         | .738                | 4.341                  | 90.863                |                                     |                        |                       |
| 6         | .430                | 2.532                  | 93.394                |                                     |                        |                       |
| 7         | .282                | 1.661                  | 95.055                |                                     |                        |                       |
| 8         | .191                | 1.122                  | 96.178                |                                     |                        |                       |
| 9         | .162                | .952                   | 97.130                |                                     |                        |                       |
| 10        | .145                | .854                   | 97.984                |                                     |                        |                       |
| 11        | .117                | .689                   | 98.673                |                                     |                        |                       |
| 12        | .078                | .459                   | 99.132                |                                     |                        |                       |
| 13        | .050                | .292                   | 99.424                |                                     |                        |                       |
| 14        | .045                | .265                   | 99.689                |                                     |                        |                       |
| 15        | .031                | .181                   | 99.870                |                                     |                        |                       |
| 16        | .014                | .083                   | 99.954                |                                     |                        |                       |
| 17        | .008                | .046                   | 100.000               |                                     |                        |                       |

**Determining the Number of Factors**

Extraction Method: Principal Component Analysis

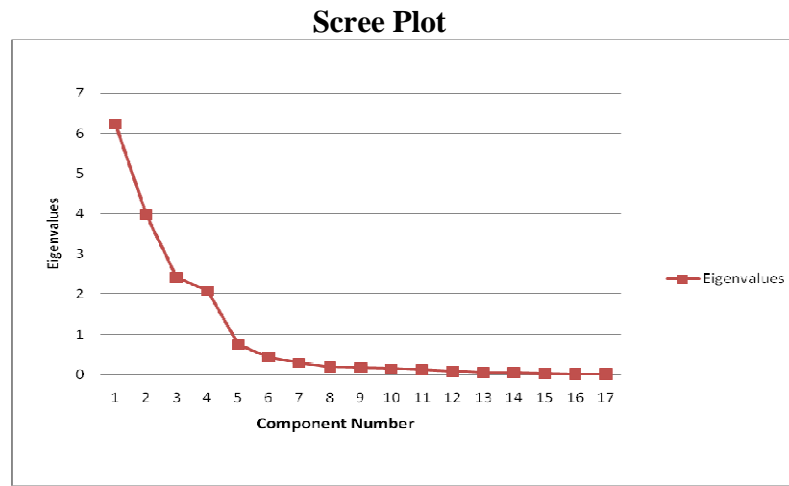
**A. Determination Based on Eigenvalues.**

The factors with Eigenvalues greater than 1.0 are retained; the other factors are not included in the model. An Eigenvalue represents the amount of variance associated with the factor. Hence in above mentioned result four factors with a

variance greater than 1.0 are included. Here in above mentioned result four factors to be extracted.

**B. Determination Based on Scree Plot.**

A scree plot is a plot of the eigenvalues against the number of factors in order of extraction. The shape of the plot is used to determine the number of factors. Typically, the plot has a distinct break between the steep slope of factors. This gradual trailing off is referred to as the scree. Hence, only four factors are being extracted from below given scree plot.



**Unrotated Factors**

The factor matrix contains the coefficients used to express the standardized variables in terms of the factors. These coefficients, the factor loadings, represent the correlations between the factors and the variables. A coefficient with a large absolute value indicates that the factor and the variable are closely related.

| Dimension   | Component |       |       |      |
|---|-----------|-------|-------|------|
|   | 1         | 2     | 3     | 4    |
| Unsafe to provide personal information.                           | -.658     | -.034 | -.034 | .586 |
| Unauthorized access to Internet banking account.                  | -.506     | -.349 | -.016 | .555 |
| Unsecure for sending sensitive information over Internet Banking. | -.785     | -.133 | -.005 | .436 |
| Fraud or hacking to Internet banking account.                     | -.560     | -.668 | -.085 | .224 |
| Breakdown of server   | -.431     | -.510 | .150  | .589 |
| No assurance of getting compensation if any error occurs.         | .755      | .074  | -.193 | .378 |
| Fear to lose money through Internet Banking.                      | .739      | -.147 | -.381 | .378 |
| Transfer of money to wrong account.                               | .861      | -.098 | -.386 | .203 |

|  |       |       |       |      |
|--|-------|-------|-------|------|
| No rollback of transaction                                     | .847  | -.059 | -.379 | .270 |
| Incorrect processing of payments by Internet banking servers.  | .842  | .164  | -.259 | .362 |
| Discontinuity in power supply during the transaction.          | -.400 | .789  | -.251 | .247 |
| Internet banking servers may not perform well due to low speed | -.307 | .906  | -.053 | .195 |
| Quality of Internet Service.                                   | -.432 | .815  | -.193 | .111 |
| Discontinuity of internet connection during the transaction    | -.202 | .905  | -.129 | .120 |
| Time wasted in error correction                                | .526  | .137  | .705  | .232 |
| Time required learning Internet Banking Services.              | .496  | .217  | .748  | .250 |
| Time required for a transaction                                | .384  | .265  | .813  | .260 |

Extraction Method: Principal Component Analysis.

4 components extracted.

The initial or unrotated factor matrix indicates the relationship between the factors and individual elements; it seldom results in factors that can be interpreted, because the factors are correlated with many variables. For example, in Table 1, factor 1 is at least somewhat correlated with seven to eight variables. Factor 2 is at least somewhat correlated with four to five variables. Factor 3 is at least somewhat correlated with two to three variables. Likewise factor 4 is at least somewhat correlated with six to seven variables. Moreover, variables V6, V7, V10, V15, V17 load at least somewhat on both the factors. Therefore, through rotation, the factor matrix is transformed into a simple one that is easier to interpret.

**Rotate Factors (Varimax Procedure)**

An orthogonal method of factor rotation is a method that minimizes the number of variables with high loadings on a factor, thereby enhancing the interpretability of the factors. Rotation achieves simplicity and enhances interpretability, whereas eight variables correlated with factor 1 in unrotated matrix, only variables V6 to V10 correlate with factor 1 after rotation. Variables V11 to V14 correlate with factor 2 after rotation, variables V1 to V5 correlate with factor 3 and remaining variables V15 to V17 after rotation.

| Dimension   | Component |       |       |       |
|---|-----------|-------|-------|-------|
|   | 1         | 2     | 3     | 4     |
| Unsafe to provide personal information.                           | -.181     | .300  | .805  | -.087 |
| Unauthorized access to Internet banking account.                  | -.088     | -.040 | .817  | -.094 |
| Unsecure for sending sensitive information over Internet Banking. | -.360     | .202  | .791  | -.172 |
| Fraud or hacking to Internet banking account.                     | -.255     | -.383 | .702  | -.338 |
| Breakdown of server   | -.091     | -.230 | .866  | .052  |
| No assurance of getting compensation if any error occurs.         | .830      | -.007 | -.124 | .225  |
| Fear to lose money through Internet Banking.                      | .909      | -.167 | -.040 | .011  |
| Transfer of money to wrong account.                               | .914      | -.198 | -.256 | .006  |

|  |       |       |       |       |
|--|-------|-------|-------|-------|
| No rollback of transaction                                     | .934  | -.143 | -.211 | .036  |
| Incorrect processing of payments by Internet banking servers.  | .916  | .061  | -.214 | .212  |
| Discontinuity in power supply during the transaction.          | -.067 | .936  | .108  | -.116 |
| Internet banking servers may not perform well due to low speed | -.118 | .966  | -.019 | .095  |
| Quality of Internet Service.                                   | -.185 | .924  | .010  | -.113 |
| Discontinuity of internet connection during the transaction    | -.042 | .933  | -.131 | .043  |
| Time wasted in error correction                                | .172  | -.100 | -.125 | .890  |
| Time required learning Internet Banking Services.              | .138  | -.023 | -.123 | .939  |
| Time required for a transaction                                | .029  | .041  | -.074 | .969  |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 5 iterations

### Interpret Factors

In rotated factor matrix of Table 2, factor 1 has high coefficients for variables V6 to V10; these variables are summarized as **Financial Risk**.

|     |   |
|-----|---|
| V6  | No assurance of getting compensation if any error occurs.     |
| V7  | Fear to lose money through Internet Banking.                  |
| V8  | Transfer of money to wrong account.                           |
| V9  | No rollback of transaction                                    |
| V10 | Incorrect processing of payments by Internet banking servers. |

Factor 2 has high coefficients for variables V11 to V14; these variables are summarized as **Performance Risk**

|     |  |
|-----|--|
| V11 | Discontinuity in power supply during the transaction.          |
| V12 | Internet banking servers may not perform well due to low speed |
| V13 | Quality of Internet Service.                                   |
| V14 | Discontinuity of internet connection during the transaction    |

Factor 3 has high coefficients for variables V1 to V5, these variables are summarized as **Security Risk**.

|    |   |
|----|---|
| V1 | Unsafe to provide personal information.                           |
| V2 | Unauthorized access to Internet banking account.                  |
| V3 | Unsecure for sending sensitive information over Internet Banking. |
| V4 | Fraud or hacking to Internet banking account.                     |
| V5 | Breakdown of server   |

Factor 4 has high coefficients for variables V15 to V17; these are summarized as **Time Risk**.

|     |   |
|-----|---|
| V15 | Time wasted in error correction.                  |
| V16 | Time required learning Internet Banking Services. |
| V17 | Time required for a transaction                   |

**Conclusion:**

The present study considered prominent risk variables affecting adoption of Internet Banking, and EFA segmented these variables into four dimensions which are labeled as financial risk security risk, time risk and performance risk.

At the end of research, we can conclude that variables having high correlation between each other can be summarized in one factor. Thus Security Risk, Performance Risk, Financial Risk and Time Risk are the major risk dimensions which affect the usage of Internet Banking of Internet Banking user in Navi Mumbai region of Thane district.

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