

## **Effect of Perceived Trust and Risk in the Adoption of Internet Banking in Kerala**

Dr. Aneeshkumar G.S  
Assistant Professor  
Department of Commerce & Centre for Research  
Bishop Abraham Memorial College  
Thuruthicad (P.O)  
Pathanamthitta-689 597, Kerala

### **ABSTRACT**

Studies on the relationship of perceived trust and risk are not done as an important determinant in the adoption of Internet Banking in Kerala. The study explores to examine the effect of perceived trust and risk in the adoption of Internet Banking in Kerala and investigates the effect of adoption of Internet Banking with Trust. The study is cross-sectional, descriptive and analytical in nature. Survey method using structured questionnaire was carried out to acquire data from 1045 respondents from Kerala. Pilot study was conducted on 48 respondents from central part of Kerala. Stratified random sampling technique was adopted for data collection. Based on the account with the banks the researcher has classified the entire sample respondents into three categories namely public, old private and new generation private sector banks. In the present study 351 (33.60 percent) respondents are from public sector banks, 340 (32.50 percent) respondents are from private sector banks and 354 (33.90 percent) respondents are from new generation private sector banks. Mean, standard deviation, Brown-Forsythe test, Jonckheere-Terpstra test, ANOVA, and Linear Regression were used for analysis. The results showed that there is linear relationship between perceived trust and risk. Also there is linear relationship existing between adoption and trust. The findings of the study have managerial implications for banks to maintain trust among the customers, banks should build websites that are not only useful and easy to use but should include trust building mechanisms. Banks should increase their ability to manage and control the various types of risks in the adoption of Internet Banking.

**Keywords:** Internet Banking, Perceived Trust, Perceived Risk, Adoption

### **1. INTRODUCTION**

The increasing usage of internet and the rising sale of PC/notebook indicate that there is a greater scope for banks to come through in the field of Internet banking. E-commerce is becoming popular, internet penetration is on an upward trend, there is an increase in the number of computer literates, PC/Notebook/Smartphone sales are on an upward trend and major users of internet comprise of young generation. All these provide a favorable environment for the growth of IB in India.

Kerala is a pioneer in e-literacy having launched two breakthrough projects as early in 2002. The **Akshaya Project, 2005** was launched with the objective of making at least one person in every family e-literate. The **IT @ School Project 2001** aimed at providing basic computer knowledge to every high school student. Kerala has now over 600 e-governance applications in almost all departments, delivering e-services to customers. This will enable ordinary citizens to effectively use internet to avail government and private services in a secure manner. Kerala has emerged 'Digital State' with a mobile tele-density of 95 percent and internet access covering 60 percent of the population (Pranab Mukherjee, President of India, 2015).

The present barriers to IT penetration in Kerala, apart from cost factors, include low levels of computer expertise, absence of sufficient IT hardware sales outlets across the state, low English language proficiency, inadequate opportunity to gain economically from IT skills, low internet penetration and inadequate local language content. (New Indian Express, 14<sup>th</sup> January 2013). Research studies shows that security, risk perceptions and trust are the major inhibitors to IB adoption. (For eg. **Cheng et al; Imtiyaz, Mattila, Manzano et al; Pikkarainen et al;**)

## **INTERNET BANKING: THE CONCEPT**

Internet banking means financial services accessed via the Internet's World Wide Web. An Internet bank exists only on the internet-the global network of computer networks without any brick and mortar branch offices. Internet banking means that banking services such as services at the time of introduction, loan application, account balance enquiry, fund transfer etc. are provided by a bank through internet. Internet banking has evolved into a one-step service and information unit that promises great benefits to both banks and consumers.

Net Banker defines Internet bank as one that provides account balances and some transactional capabilities to retail customers over the World Wide Web. Internet banks are also known as virtual, cyber, net, interactive, or web banks.

Internet banking is defined as a service that allows customers to perform a variety of banking transactions on the internet via. Bank's website (**Tan & Teo, 2000**).

**Chang (2003), Sullivan and Wang (2005)** view Internet banking as a process, innovation whereby customers handle their own banking transactions without visiting bank tellers.

## **2. PERCEIVED RISK**

**Peter and Ryan defined perceived risk as a kind of subjective expected loss. Ming-Chi Lee** defined perceived risk in the context of IB as the subjectively determined expectation of loss by an online bank user in contemplating a particular online transaction. Most of the researchers claim that consumer's perceived risk is a kind of multi-dimensional construct and five components or types of perceived risk in IB have been identified viz. financial, performance, social, privacy, and time/convenience. Researchers have found that perceived risk is influenced by trust toward the transaction partner. When people trust others, they assume that those they trust will behave as they expect to, reducing the complexity of the interaction.

**Jarvenpaa and Todd** have explained that trust works as a mechanism for reducing consumers' perceived risk in internet shopping.

### **Perceived Risks associated with IB**

Risk is defined as the chance of something happening that will have an impact on expected objectives. The risks in banking are mainly classified as;

**LIQUIDITY RISK**

Liquidity risk is the risk of economic losses resulting from the fact that the sum of all inflows and the cash reserves of a financial intermediary on a day are not sufficient to meet its outflows on that day. Liquidity risk is defined as the inability to obtain funds to meet cash flow obligations at a reasonable rate. The liquidity risks may be funding risk, time risk and call risk.

**INTEREST RATE RISK**

Interest Rate Risk (IRR) is the exposure of a bank's revenue to adverse movements in interest rates. IRR refers to potential adverse impact on net interest income. IRR can be viewed in two ways: its impact is on the earnings of the bank or its impact on the economic value of the bank's assets, liabilities and off-balance sheet positions.

**MARKET RISK**

Market risk is the risk of adverse deviations of the mark-to-market value of the trading portfolio, due to market movements, during the period of holding. **Bank for International Settlements (BIS)** defines market risk as 'the risk of losses in on and off-balance sheet positions arising from movements in market prices'. Forex risk and market liquidity risk are the two market risks.

**DEFAULT/CREDIT RISK**

Credit risk is the risk that a counter party will not settle an obligation for full value, either when due or at any time thereafter. Banks may not be able to properly evaluate the credit worthiness of the customer while extending credit through remote banking procedures, which could enhance the credit risk. Presently, banks generally deal with more familiar customer base. Facility of electronic bill payment in Internet banking may cause credit risk if a third party intermediary fails to carry out its obligations with respect to payment. Proper evaluation of the creditworthiness of a customer and audit of lending process are a must to avoid such risk.

**The Basel Committee on Banking Supervision (BCBS)** defines credit risk as 'the potential risk in which a bank borrower or counter party will fail to meet its payment obligations regarding the terms agreed with the bank'. Counter party risk and country risk are the two default/credit risks.

**OPERATIONAL RISK**

Operational risk, also referred to as transactional risk is the most common form of risk associated with IB. It takes the form of inaccurate processing of transactions, non enforceability of contracts, compromises in data integrity, data privacy and confidentiality, unauthorized access / intrusion to bank's systems and transactions etc. Such risks can arise out of weaknesses in design, implementation and monitoring of banks' information system. Besides inadequacies in technology, human factors like negligence by customers and employees, fraudulent activity of employees and crackers / hackers etc. can become potential source of operational risk.

The New Basel Accord (2003) defines operational risk as the risk of loss resulting from inadequate/ failed internal processes, people and systems or from external events. Operational risk includes fraud risk, communication risk, documentation risk, competence risk, model risk, cultural risk, external events risk, legal risk, regulatory risk, compliance risk, and so on. Transaction and compliance risk are frequently occurring risks in India.

**TRUST**

Studies related to IB have shown that trust is a critical factor in stimulating IB operations. Doney and Cannon define trust as the perceived credibility and benevolence of a target group of

customers. The first dimension the perceived credibility is the extent to which one partner believes that the other partner has the required expertise to perform the job effectively and reliably. Benevolence concerns the consumer's belief that the company is interested in his or her welfare, has no intention of behaving opportunistically and it is motivated by the quest for mutual benefit. Studies found that perceived ease of use is an antecedent of trust and PEOU increases the trust. However, **Kent Eriksson** et al; considered trust in IB as an antecedent to ease of use and perceived usefulness and found that trust has a positive effect on both ease of use and usefulness.

### **3. REVIEW OF LITERATURE**

**Mayer et al; (1995)** have clarified the relationship between trust and risk. Trust is the willingness to assume risk, while trust is the assumption of risk. If the level of trust surpasses the perceived risk, then the trust or will engage in a risk taking, relationship initial trust is used for the study in order to assess the level of trust a consumer has just before he/she adopts Internet banking.

**Kim and Bipin (2000)** have studied initial trust and perceived risk have influenced the adoption of Internet banking. They believe that the major determinants of the adoption are trust in the electronic channel and perceived risks of e-commerce.

**Shumalia (2009)** finds that trust and perceived risk are shown to be direct antecedents of intention, suggesting that uncertainty reduction is a key component in the customers' acceptance of Internet banking thus it deserves particular attention. Trust has a direct effect on intentions but at the same time it also acts as an indirect antecedent through perceived risk and perceived usefulness.

**Hamidreza and Hamideh (2012)** made a study to determine factors affecting client trust in the context of online banking. They examined the security, privacy, usability and reputation perceived by customers on client trust in online banking. They found that direct and significant association between trust and variables such as security, privacy, usability and reputation.

**Mathews and Kudakwashe(2014)** investigated the impact of consumer trust on online banking and the risks imposed by it. Trust and risk balance is the ultimate goal for all banking institutions to achieve acceptable level of customer satisfaction. They found that customer satisfaction is also affected by the level of privacy perceived when performing online banking transactions. One of the methods that the banks are using for secure their online service are encryption and E- signature, SSL Certificate and VeriSign Secured Seal.

**Chorng and Yi-Luen(2015)** made an integrated SRT (Security- Risk -Trust) model to explain the relationships among trust and the other highly relevant factors, perceived security and perceived risk as well as the effects of SRT on individuals' adoption of IB. The result of the study showed that perceived security is an important antecedent of trust and perceived risk. Perceived security has both direct and indirect effects upon individuals' adoption of IB. Highly perceived security not only reduces an individuals' perceived risk but also enhances his trust in the IB context, which allows high adoption rate. The management of IB should pay more attention to strengthen individuals' perceived security, such as implementing novel information security mechanisms and marketing methods.

**Do Hoai and Nguyen (2016)** assess the factors influencing on customers' adoption of Internet banking with the case of Vietnam. Knowledge and income, trust and risks, banks and government are the factors affecting on customers' adoption of IB in Vietnam. Banks in Vietnam need to catch the customers' psychology raise vigilance and make trust from them by setting the appropriate regulations and giving strict punishments to control the activities of banks to avoid risk exposure.

**Okari(2017)** examined the consumer perceived risk of IB and adoption in Kenya. The study established that young adults are mostly involved in the use of IB services. Majority of the respondents found IB to be useful. The information security indicates that majority disagrees that sending sensitive information across IB include: slow network connection, network failure, poorly designed websites, no service during website maintenance and forgotten password. The suggestion is that IB service providers must adopt up-to-date internet infrastructure mechanisms to ensure that internet connection and network failure is reduced significantly. Banking institutions should ensure that their IB systems have an uncompromised level of security features built in, by way of back office systems security, operational and procedural security and transactional security. Such precautions are essential to enhance customer confidence in using the internet for IB services.

**Lafraxo et al; (2018)** developed an acceptability model based on UTAUT and three additional factors namely perceived risk, security and trust. Performance expectancy, effort expectancy, social influence and security in mobile banking showed a significant positive impact on the user's behavioral intention to accept mobile banking services. Trust, facilitating conditions and perceived risk in the mobile application does not influence positively the behavioral intention.

#### **4. RESEARCH GAP AND OBJECTIVES**

Internet banking is a novel technological development in the field of banking. Many studies have been done in this field and its allied areas. The review of past studies helps the researcher to identify the explored area of research. The researcher collected a lot of reviews written by number of researchers. The consumers trust in the bank which provides IB services motivates the evaluation of risk in Internet banking services. The study explores to examine the effect of perceived trust and risk in the adoption of Internet Banking in Kerala and investigates the effect of adoption of Internet Banking with Trust. No other research works fulfill the objectives of the researcher.

#### **5. METHODOLOGY**

The current work tries to discover effect of Perceived Trust and Risk in the Adoption of Internet Banking in Kerala. As such, the current research study has been intended as an explanatory study and Normative Review Technique (NRT) was assumed as the pertinent ways for congregation of the indispensable data for the study.

Primary data were collected from the customers of public sector, old-private sector and new generation banks in Kerala through structured questionnaire. The investigator personally administered the structured questionnaire. The secondary data are collected from various publications of the State Planning Board, Department of Economics and Statistics, Department of Agriculture, published and unpublished reports, documents, articles, working papers, published and unpublished research dissertations and from the relevant websites.

For the purpose, respondents from the three sectors will be identified viz; Public Sector Banks (PSBs), Old Private Sector Banks (OPBs) and New Generation Banks (NGBs). From the PSBs, State Bank of India (SBI), Canara Bank (CB) and Union Bank (UB) are selected for detailed study. From Old Private Banks, Federal Bank (FB), South Indian Bank (SIB) and Catholic Syrian Bank (CSB) are selected. From New Generation Banks, ICICI, HDFC and Axis bank will be selected.

On the basis of geographical, historical and cultural importance, the districts in Kerala are generally divided into three regions. Viz; North Kerala (Kasaragod, Kannur, Wayanad, Kozhikode, Malappuram, Palakkad), Central Kerala (Thrissur, Ernakulam, Kottayam, Idukki) and South Kerala (Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta). To accommodate geographical significance, as the second stage of sample selection, one district from each region was selected and

accordingly North Kerala is represented by Kozhikode, Central Kerala by Ernakulum and South Kerala by Thiruvananthapuram.

In order to arrive at the concrete sample size, the researcher has used the following data. The Sample Size Calculator is used to calculate the sample size. For a level of significance at 5percent, confidence Interval of 8 percent, Confidence level of 95percent, and  $Z=1.96$ , the following sample size was determined corresponding to the population.

Thus it is clear that in each category of banks the researcher has divided banks into three groups each based on the volume of business, number of customers, and the total number of branches in Kerala. Hence in every branch of the above mentioned banks in Kerala, the researcher has collected one sample data each, thus arriving the total sample size of **1045**.

### **TOTAL SAMPLE OF RESPONDENTS**

| <b>SL.NO</b> | <b>SECTOR</b>  | <b>BANKS SELECTED</b>  | <b>NUMBER OF SAMPLES</b> |
|--------------|----------------|------------------------|--------------------------|
| 1.           | Public         | SBI, CB, UB            | 351                      |
| 2.           | Old Private    | FB, SIB, CSB           | 340                      |
| 3.           | New Generation | ICICI, HDFC, Axis Bank | 354                      |
| Total Sample |                |                        | 1,045                    |

**TABLE NO 1**

The mode of selecting a sample is stratified random sampling.

Mean, standard deviation, Brown-Forsythe test, Jonckheere-Terpstra test, ANOVA, and Linear Regression were used for analysis of data.

### **6. ANALYSIS AND RESULTS**

From the table 2 it is clear that 30.50 percent (319) customers are selected from Trivandrum district, 47.10 percent (492) customers are selected from Ernakulum district and 22.40 percent (234) customers are selected from Kozhikode district. 51.70 percent of the total customers selected are male and majority (53.70percent) of the customers is having educational qualification Post-Graduation. With reference to the occupation 48.30 percent are employed either private sector or Government sector or 19.90 percent are professionals. Based on the category of banks 351(33.60percent) respondents are from public sector banks, 340(32.50percent) respondents are from private sector banks and 354 (33.90percent) respondents are from new generation private sector banks considered for the present study.

### **CATEGORY OF RESPONDENTS**

| <b>DISTRICT</b> | <b>NO.</b>  | <b>PERCENTAGE</b> |
|-----------------|-------------|-------------------|
| Trivandrum      | 319         | 30.5              |
| Ernakulum       | 492         | 47.1              |
| Kozhikode       | 234         | 22.4              |
| <b>Total</b>    | <b>1045</b> | <b>100.0</b>      |
| <b>Gender</b>   | <b>No.</b>  | <b>Percentage</b> |
| Male            | 540         | 51.7              |
| Female          | 505         | 48.3              |
| <b>Total</b>    | <b>1045</b> | <b>100.0</b>      |

| <b>Educational qualification</b> | <b>No.</b>  | <b>Percentage</b> |
|----------------------------------|-------------|-------------------|
| Graduate                         | 228         | 21.8              |
| Post Graduate                    | 561         | 53.7              |
| Professional                     | 256         | 24.5              |
| <b>Total</b>                     | <b>1045</b> | <b>100.0</b>      |
| <b>Occupation</b>                | <b>No.</b>  | <b>Percentage</b> |
| Student                          | 178         | 17.0              |
| Business                         | 154         | 14.7              |
| Employed                         | 505         | 48.3              |
| Professional                     | 208         | 19.9              |
| <b>Total</b>                     | <b>1045</b> | <b>100.0</b>      |
| <b>Category of Bank</b>          | <b>No.</b>  | <b>Percentage</b> |
| Public sector                    | 351         | 33.6              |
| Old Private sector               | 340         | 32.5              |
| New Generation banks             | 354         | 33.9              |
| <b>Total</b>                     | <b>1045</b> | <b>100.0</b>      |

**Source:** Field survey**TABLE NO 2****Relation of Risk and Trust**

Perceived Risk and Trust are related to each other. If the risk in the adoption of Internet bank is high, obviously the perception of trust by the customers will be low. Trust refers to the faith showered by the bank authorities to the esteemed customers for the adoption of the Internet banking. Now an attempt has been done to evaluate the prediction of trust with reference to the independent variable Perceived Risk.

**Ho1: There is no linear relationship between Trust and Perceived Risk**

**PREDICTION OF TRUST WITH PERCEIVED RISK-ANOVA**

| <b>MODEL</b> | <b>SUM OF SQUARES</b> | <b>DF</b> | <b>MEAN SQUARE</b> | <b>F</b> | <b>SIG.</b> | <b>R SQUARE</b> |
|--------------|-----------------------|-----------|--------------------|----------|-------------|-----------------|
| Regression   | 1.543                 | 1         | 1.543              | 4.818    | .028        | 5%              |
| Residual     | 334.034               | 1043      | .320               | Result   | Significant |                 |
| Total        | 335.577               | 1044      |                    |          |             |                 |

**Source:** Field survey**TABLE NO 3**

The dependent variable is trust and independent variable is Perceived Risk. The prediction is fit according to the above table as the Anova value is 4.818 and the Significance value is 0.028, the result is statistically significant, which is reliable according to the R Square value and it is 5percent. Hence the original hypothesis is rejected. There is linear relationship between Trust with Perceived Risk.

**PREDICTION OF TRUST WITH PERCEIVED RISK- COEFFICIENTS**

| MODEL          | UNSTANDARDIZED COEFFICIENTS |            | STANDARDIZED COEFFICIENTS | T      | SIG. |
|----------------|-----------------------------|------------|---------------------------|--------|------|
|                | B                           | Std. Error | Beta                      |        |      |
| (Constant)     | 3.453                       | .101       |                           | 34.123 | .000 |
| Perceived Risk | .067                        | .031       | .068                      | 2.195  | .028 |

**Source:** Field survey

**TABLE NO 4**

Since the model is to predict the trust, a Regression equation is derived from the above table.

$$\text{Trust} = \text{Constant} \times 3.543 + \text{Perceived Risk} \times 0.067$$

Also t test was separately conducted to each independent variable and its role to predict the dependent variable. Here both constant and perceived risk is appropriate to predict the dependent variable trust.

Also a brief sketch was outlined to predict the relationship with the Trust with the variable Adoption.

**Ho2: There is no linear relationship between Adoption and Trust**

**PREDICTION OF ADOPTION WITH TRUST –ANOVA**

| MODEL      | SUM OF SQUARES | DF   | MEAN SQUARE | F      | SIG.        | R SQUARE |
|------------|----------------|------|-------------|--------|-------------|----------|
| Regression | 6.560          | 1    | 6.560       | 12.380 | .000        | 1.20%    |
| Residual   | 552.697        | 1043 | .530        |        |             |          |
|            | 559.257        | 1044 |             | Result | Significant |          |
| Total      | 335.577        | 1044 |             |        |             |          |

**Source:** Field survey

**TABLE NO 5**

The dependent variable is Adoption and independent variable is Trust. The prediction is fit according to the above table as the Anova value is 12.380 and the significance value is 0.000, the result is statistically significant, which is reliable according to the R Square value and it is 1.20percent. Hence the original hypothesis is rejected. There is linear relationship between Adoptions with Trust.

**PREDICTION OF ADOPTION WITH TRUST - COEFFICIENTS**

| Model      | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|------------|-----------------------------|------------|---------------------------|--------|------|
|            | B                           | Std. Error | Beta                      |        |      |
| (Constant) | 3.403                       | .148       |                           | 23.054 | .000 |
| Trust      | .140                        | .040       | .108                      | 3.519  | .000 |

**Source:** Field survey

**TABLE NO 6**

Since the model is to predict the Adoption, a Regression equation is derived from the above table.



$$\text{Adoption} = \text{Constant} \times 3.403 + \text{Trust} \times 0.140$$

Also t test was separately conducted to each independent variable and its role to predict the dependent variable. Here the independent variable can appropriate to predict the dependent variable Adoption.

## 7. CONCLUSION AND RESEARCH IMPLICATIONS

The study justifies its title by answer to the two questions- is there is any relationship between Trust and Perceived Risk and is there is any relationship between Adoption and Trust. Perceived Risk (PR) is very high in the case of public sector banks than old private or new generation banks. The perceived risk has a negative effect on adoption. The IB service providers must have a continuous interaction with customers and convey an effective message about the world class inbuilt security features now used by the banks to protect customers from any hacking. Banks should aim at continuously educating its customers and solicit their participation in various preventive / detective measures. Banks should make disclosure of risks, responsibilities of customers while banking through internet. The power of senior managers is needed to enforce secure and ethical security and privacy practices. As found in the reviewed literature, an association or relationship was found in the present study that trust is related with the adoption of IB. Keeping in mind banks must capitalize the lengthy relationship and existing trust to make confidence and can motivate the customers for the extensive use of IB. From the study, it is found that trust is high among new generation banks. So public and old private sector banks must plan strategies to enhance trust among their customers. In case of IB, trust is the degree to which individuals perceive the usage of IB platform is secure and free of private threats, privacy and security measures lead to ongoing trust. Banks should give tips for safe use of Internet banking to the customers.

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