

ANALYSIS OF INTEREST RATE RISK IN E-BANKING

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Abstract

In this study, an attempt is made to analyze the bankers' viewpoint towards the factors responsible for interest rate risk in e-banking, its impacts on the functioning of the banks and the measures for overcoming the risk by the selected public, private and foreign banks in India. A sample of 107, 104 and 100 bank employees is taken on the basis of judgement sampling from different branches of selected public, private and foreign banks respectively located in Haryana, Punjab, Chandigarh and Delhi. The primary data are collected with the help of pre-tested structured questionnaire on five point Likert Scale i.e. Strongly Disagree (SD), Disagree (A), Neutral (N), Agree (A) and Strongly Agree (SA). For coding and analyzing the data, weights are assigned in order of importance i.e. 1 to Strongly Disagree (SD), 2 to Disagree (A), 3 to Neutral, 4 to Agree (A), and 5 to Strongly Agree (SA). Statistical techniques such as mean, mode, standard deviation have been used for the analysis of data. ANOVA technique has been applied to test the hypotheses and validate the results of the study. The analysis shows that the decrease in the value of assets relative to electronic money liabilities is viewed as the most important factor leading to the interest rate risk in the selected banks. Further, unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements is viewed as the most important impact on the functioning of these banks. However, instituting interest rate risk management measures commensurate with bank's exposure is found as the most adopting measure for overcoming the risk in selected public, private and foreign banks.

Key Words: Electronic Money, Unanticipated, Compliance, Regulatory, Commensurate

Introduction

Indian banking sector is in the mid of an IT revolution these days. The public sector banks are in the process of making huge investment in technology. However, new private sector banks and foreign banks have an edge over public sector banks in the implementation of technological solutions. To be successful in this competitive environment, these banks have to take certain steps like cost reduction by economies of scale, better relations with the customers by providing better services and facilities to them. With the help of technology, the banks are now able to offer such products and services, which were difficult or impossible with traditional banking. India has been able to take one step in this direction - physical cash has been replaced by anytime, anywhere money, but these are more pronounced in foreign and private sector banks. The public sector banks are far behind in technology integration. Thus, there is a huge scope for automation in the banking industry (www.centralbank.in). The service based areas of banks have perhaps been the largest beneficiary of e-banking. ATMs, credit cards, internet banking, mobile banking which are already widely used around the world, have yet to reach their full potential in India. These services and products are all expected to grow in the coming years. No doubt, e-banking provides so many benefits, but face to face contact between the bank and the customer is absent in e-banking transactions, which causes most of the problems like credit card frauds, fraud of internet, etc. Rising competition is forcing the banks to find innovative ways to reduce the cost of transactions and increase the profitability. Technology has been one of the major enabling factors for enhancing the customer convenience in the products and services offered by the various banks and help in enhancing service range but the security of the transactions is a major concern. While it mitigates some risks, but induces some risks also, which are highly interdependent and events that affect one area of risk also have ramifications for a range of other risk categories (Singh, 2015).

Review of Literature

Various articles appeared in different journals on varied aspects of e-banking, which are restrictive in nature and do not give a comprehensive picture. Ahmad et. al. (2010)

discussed the security issues on banking systems and stated that banking system intrusion shows the vulnerabilities that exist in financial institution and have been used by those illegal and unauthorized individuals or groups to intrude an area with secure environment. With the developing of high technology and information system around the world, banking system should not be left behind in terms of security system and should keep a sharp eye when there is any vulnerability in authentication and authorization that may lead to confidentiality, availability and integrity issues. Fatima (2011) concluded that biometric based authentication and identification systems are the new solutions to address the issues of security and privacy. One thing that can be said with certainty about the future of the biometrics industry is that it is growing. Biometrics is finding its ways into all kinds of applications beyond access control. It is expected that more and more information systems/computer networks will be secured with biometrics with the rapid expansion of internet and intranet. Adewuyi (2011) concluded that the adoption of TCT has influenced the content and quality of banking operations and presented a great potential for business re-engineering of Nigerian banks. Thus, investment in ICT should form an important component in the overall strategy of banking operation to ensure effective performance. Mermud (2011) analyzed the internet bank branches in Turkey with regard to many dimensions and found that online customers admit that internet bank branches are safe and cheaper and understandable and saving extra time. Internet banking usage rate have increased in the last years, depending on the increase of educated users. The usage rate of the internet banking is significantly related with the education levels. Education and also income level makes an important difference in the usage of internet banking facilities. Karimzadeh and Alam (2012) examined the e-banking challenges in India and concluded that legal and security, socio-cultural and management, banking issues are accepted as challenges for the development of e-banking. But there is less awareness regarding new technologies and unsuitable software which are ranked respectively as the highest and lowest obstacles in India. Osunmuyiwa (2013) examined the various aspects of online banking risks, the risk management methods employed in mitigating these risks and recommended that banks that carry out online banking clearly should explain the privacy rule and communicate it to their clients. Banks can also make use of materials like vendor oversight, assignment sheet; excel spreadsheet for risk

assessment for policies amongst so many created from a range of data resources to carry out data safekeeping. Singh and Chaudhry (2014) analyzed the bankers' viewpoint towards various types of e-banking risks in selected public, private and foreign banks in India. The operational risk is found as the most important risk in e-banking in all the three categories of banks followed by reputational and legal risk, whereas strategic risk was considered as the least important risk in all the selected banks.

With this background, an attempt is made to examine the various aspects of interest rate risk in e-banking in selected public, private and foreign banks in India, which is the risk to earnings or capital arising from movement of interest rates. It arises from differences between the timing of rate changes and the timing of cash flows (re-pricing risk); from changing rate relationships among yield curves that affect bank activities (basis risk); from changing rate relationships across the spectrum of maturities (yield curve risk); and from interest-rate-related options embedded in bank products (option risk). The evaluation of interest rate risk must consider the impact of complex, illiquid hedging strategies or products and also the potential impact on fee income that is sensitive to changes in interest rates.

Scope of the Study

The present study is confined to the analysis of interest rate risk in e-banking in selected public, private and foreign banks in Haryana, Delhi, Chandigarh and Punjab.

Objectives of the Study

The main objective of the study is to examine the various aspects of interest rate risk in e-banking in India. In this broader framework, the following are the specific objectives of the study:

- (1) To analyze the factors leading to interest rate risks in e-banking in the selected banks.
- (2) To examine the impacts of interest rate risks in e-banking on the functioning of the selected banks.
- (3) To appraise the measures for overcoming the interest rate risks in e-banking in the selected banks.

Research Hypotheses

The following hypotheses have been formulated and tested to achieve the objectives of the study:

H₀₁: There is no significant difference among the bankers' viewpoint towards the factors leading to interest rate risks in e-banking in the selected banks.

H₀₂: There is no significant difference among the bankers' viewpoint towards the impacts of interest rate risks in e-banking in the selected banks.

H₀₃: There is no significant difference among the bankers' viewpoint towards the measures to overcome the interest rate risks in e-banking in the selected banks.

Sample Profile and Data Collection

For collecting data, all the banks have been divided into three categories i.e. public, private and foreign banks. A sample of 375 respondents (bankers) is taken from the various branches of the selected banks (125 respondents from each group). As the present study is of analytical and exploratory in nature and therefore use is made of primary data only, which are collected with the help of pre-tested structured questionnaire on five point Likert Scale i.e. Strongly Disagree (SD), Disagree (A), Neutral (N), Agree (A), and Strongly Agree (SA). After examination, 107 questionnaires from public sector banks, 104 from private sector banks and 100 from foreign banks were found complete and used for further analysis. Besides questionnaire, interviews and discussion techniques were also used to unveil the information.

Data Analysis

The collected data were analyzed through descriptive statistical techniques like frequency distribution, percentage, mean, mode, standard deviation with the help of PASW 18.0 version. For coding and analyzing the data, weights are assigned in order of importance i.e. 1 to Strongly Disagree (SD), 2 to Disagree (D), 3 to Neutral, 4 to Agree (A), and 5 to Strongly Agree (SA). ANOVA technique was employed to test the hypotheses and validate the results of the study.

Results and Discussions

(A) Factors Leading to Risk

The factors leading to the interest rate risk in the selected public, private and foreign banks are given in Table 1 (A) and 1 (B).

Public Sector Banks

59 respondents (55.1 per cent) viewed the decrease in the value of assets relative to electronic money liabilities (Mean = 4.26, S.D. = 0.718) as the most important factor leading to the interest rate risk, whereas may be a problem for banks who are specialized in electronic money issuance (Mean = 4.09, S.D. = 0.830) is given as the second important factor as per the opinion of 59 respondents (55.1 per cent).

Private Sector Banks

48 respondents (46.2 per cent) viewed the decrease in the value of assets relative to electronic money liabilities (Mean = 4.26, S.D. = 0.763) as the most important factor leading to the interest rate risk, whereas may be a problem for banks who are specialized in electronic money issuance (Mean = 4.10, S.D. = 0.865) is considered as the next important factor as per the responses of 52 respondents (50.0 per cent).

Foreign Banks

49 respondents (49.0 per cent) viewed the decrease in the value of assets relative to electronic money liabilities (Mean = 4.00, S.D. = 0.865) as the most important factor leading to the interest rate risk, whereas may be a problem for banks who are specialized in electronic money issuance (Mean = 3.97, S.D. = 0.846) is viewed as the next important factor as per the responses of 52 respondents (52.0 per cent).

Table 1 (A): Factors Leading to Interest Rate Risk

Statements	N/P	Public Sector Banks					Private Sector Banks					Foreign Banks				
		SD	D	I	A	SA	SD	D	I	A	SA	SD	D	I	A	SA
Decrease in the value of assets relative to electronic money liabilities	N	1	2	5	59	40	1	1	11	48	43	1	5	16	49	29
	P	0.9	1.9	4.7	55.1	37.4	1.0	1.0	10.6	46.2	41.3	1.0	5.0	16.0	49.0	29.0

May be a problem for banks who are specialized in electronic money issuance	N	1	6	8	59	33	1	6	10	52	35	1	5	16	52	26
	P	0.9	5.6	7.5	55.1	30.8	1.0	5.8	9.6	50.0	33.7	1.0	5.0	16.0	52.0	26.0

Note: N = Number of Respondents, P = Percent

Source: Survey

Table 1(B): Factors Leading to Interest Rate Risk

Statements	Public Sector Banks			Private Sector Banks			Foreign Banks			ANOVA	
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F	Sig.
Decrease in the value of assets relative to electronic money liabilities	107	4.26	0.718	104	4.26	0.763	100	4	0.865	3.763	0.024*
May be a problem for banks who are specialized in electronic money issuance	107	4.09	0.83	104	4.1	0.865	100	3.97	0.846	0.736	0.480

Note: N = Number of Respondents, S.D. = Standard Deviation, *= Significant at 0.05 level of significance, Degrees of Freedom=2,308

Source: Survey

The results of ANOVA in Table 1 (B) show that there is a significant difference among the bankers’ viewpoint towards decrease in the value of assets relative to electronic money liabilities (p=0.024, df=2, 308) at 5 percent level of significance. Therefore, the null hypothesis (H_{01}) is rejected.

(B) Impacts of Risk

The impacts of interest rate risk on the functioning of selected public, private and foreign banks are given in Table 2 (A) and 2 (B).

Public Sector Banks

Unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements (Mean = 4.20, S.D. = 0.720) is found by 62 respondents (57.9 per cent) as the most significant impact on these banks, whereas increase in liquidity problems of banks (Mean= 3.87, S.D. = 0.814) is considered as the next significant impact as per the opinion of 58 respondents (54.2 per cent). On the other hand, loss of business (Mean = 3.79, S.D. = 1.000) is viewed as the least significant impact by 35 respondents (32.7 per cent).

Table 2 (A): Impacts of Interest Rate Risk on Banks

Statements	N/P	Public Sector Banks					Private Sector Banks					Foreign Banks				
		SD	D	I	A	SA	SD	D	I	A	SA	SD	D	I	A	SA
Unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements	N	1	2	7	62	35	1	2	3	73	25	2	8	10	54	26
	P	0.9	1.9	6.5	57.9	32.7	1.0	1.9	2.9	70.2	24.0	2.0	8.0	10.0	54.0	26.0
Increase in liquidity problems of banks	N	1	5	22	58	21	0	3	19	62	20	6	7	14	53	20
	P	0.9	4.7	20.6	54.2	19.6	0	2.9	18.3	59.6	19.2	6.0	7.0	14.0	53.0	20.0
Loss of business	N	3	5	34	35	30	1	4	25	43	31	1	8	24	50	17
	P	2.8	4.7	31.8	32.7	28.0	1.0	3.8	24.0	41.3	29.8	1.0	8.0	24.0	50.0	17.0

Note: N = Number of Respondents, P = Percent

Source: Survey

Private Sector Banks

Unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements (Mean = 4.14, S.D. = 0.645) is found by 73 respondents (70.2 per cent) as the most significant impact on these banks, whereas increase in liquidity problems of banks (Mean = 3.95, S.D. = 0.702) and loss of business (Mean = 3.95, S.D.=

0.885) are considered as the next two significant impacts by 62 respondents (59.6 per cent) and 43 respondents (41.3 per cent) respectively.

Table 2 (B): Impacts of Interest Rate Risk on Banks

Statements	Public Sector Banks			Private Sector Banks			Foreign Banks			ANOVA	
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F	Sig.
Unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements	107	4.2	0.72	104	4.14	0.645	100	3.94	0.93	3.151	0.044*
Increase in liquidity problems of banks	107	3.87	0.814	104	3.95	0.702	100	3.74	1.05	1.553	0.213
Loss of business	107	3.79	1	104	3.95	0.885	100	3.74	0.872	1.509	0.223

Note: N = Number of Respondents, S.D. = Standard Deviation, *= Significant at 0.05 level of significance, Degrees of Freedom=2,308

Source: Survey

Foreign Banks

Unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements (Mean = 3.94, S.D. = 0.930) is viewed by 54 respondents (54.0 per cent) as the most significant impact on these banks, whereas increase in liquidity problems of banks (Mean = 3.87, S.D. = 0.814) and loss of business (Mean = 3.79, S.D. = 1.000) are found as the next two significant impacts by 53 respondents (53.0 per cent) and 50 respondents (50.0 per cent) respectively.

The results of ANOVA in Table 2 (B) show that there is a significant difference among the bankers' viewpoint towards unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements ($p=0.044$, $df=2, 308$) at 5 percent level of significance. Therefore, the null hypothesis (H_{02}) is rejected.

(C) Measures to Overcome the Risk

The measures to overcome the interest rate risk in selected public, private and foreign banks are shown in Table 3 (A) and 3 (B)

Public Sector Banks

Instituting interest rate risk management measures commensurate with bank’s exposure (Mean = 4.13, S.D. = 0.674) is found by 63 respondents (58.9 per cent) as the most adopting risk management measure in these banks.

Private Sector Banks

Instituting interest rate risk management measures commensurate with bank’s exposure (Mean = 4.28, S.D. = 0.548) is viewed by 65 respondents (62.5 per cent) as the most adopting risk management measure in these banks.

Foreign Banks

Instituting interest rate risk management measures commensurate with bank’s exposure (Mean = 4.09, S.D. = 0.698) is found by 60 respondents (60.0 per cent) as the most adopting risk management measure in foreign banks.

Table 3 (A): Measures to Overcome the Interest Rate Risk

Statements	N/P	Public Sector Banks					Private Sector Banks					Foreign Banks				
		SD	D	I	A	SA	SD	D	I	A	SA	SD	D	I	A	SA
Instituting interest rate risk management measures commensurate with bank’s exposure	N	0	2	12	63	30	0	0	5	65	34	0	3	11	60	26
	P	0	1.9	11.2	58.9	28.0	0	0	4.8	62.5	32.7	0	3.0	11.0	60.0	26.0

Note: N = Number of Respondents, P = Percent

Source: Survey

Table 3 (B): Measures to Overcome the Interest Rate Risk

Statements	Public Sector Banks			Private Sector Banks			Foreign Banks			ANOVA	
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F (df=2,308)	Sig.
Instituting interest rate risk	107	4.13	0.674	104	4.28	0.548	100	4.09	0.548	2.461	0.087

management measures commensurate with bank's exposure											
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Note: N = Number of Respondents, S.D. = Standard Deviation

Source: Survey

The results of ANOVA in Table 3 (B) show that there is no significant difference among the bankers' viewpoint towards the risk management measure to overcome the interest rate risk at 5 percent level of significance. Therefore, the null hypothesis (H_{03}) is accepted.

Conclusion

To sum up, decrease in the value of assets relative to electronic money liabilities is viewed as the most important factor leading to the interest rate risk in the selected banks. Further, unanticipated decline in value of assets could bring bank out of compliance with regulatory requirements is viewed as the most important impact on the functioning of these banks. However, instituting interest rate risk management measures commensurate with bank's exposure is found as the most adopting measure in the selected public, private and foreign banks for overcoming the interest rate risk.

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