Adoption of Internet Banking: An Empirical Investigation of Indian Banking Sector

By Balwinder Singh, Reader, Department of Commerce and Business Management, Guru Nanak Dev University, Amritsar, India
Email: bsssaini@yahoo.com

By Pooja Malhotra, Research Scholar, Department of Commerce and Business Management, Guru Nanak Dev University, Amritsar, India
Email: ashpm2@yahoo.com

Abstract

The tremendous advances in technology and the aggressive infusion of information technology had brought in a paradigm shift in banking operations. Internet banking that has revolutionized the banking industry world wide has turned out to be the nucleus issue of various studies all over the world. However there has constantly been a literature gap on the issue in India. The purpose of this paper is to help fill significant gaps in knowledge about the Internet banking landscape in India. The paper presents data, drawn from a survey of commercial banks websites, on the number of commercial banks that offer Internet banking and on the products and services they offer. It investigates the profile of commercial banks that offer Internet banking, using univariate statistical analysis, relative to other commercial banks with respect to profitability, cost efficiency, and other characteristics. By the end of first quarter, 2004, differences between Internet and non-Internet banks had begun to emerge in funding, in sources of income and expenditures and in measures of performance. It was also found that the profitability and offering of Internet banking does not have any significant correlation.

INTRODUCTION

The tremendous advances in technology and the aggressive infusion of information technology had brought in a paradigm shift in banking operations. For the banks, technology has emerged as a strategic resource for achieving higher efficiency, control of operations, productivity and profitability. For customers, it is the realization of their 'anywhere, anytime, anyway' banking dream. This has prompted the banks to embrace technology to meet the increasing customer expectation and face the tough competition.

The recent trends show that most 'brick and mortar' banks are shifting from a 'product-centric' model to a 'customer-centric' model as they develop their new e-banking capabilities. They have, over a long time, been using electronic and telecommunication networks for delivering a wide range of value added products and services. The delivery channels include direct dial–up connections, private networks, public networks etc and the devices include telephone, Personal Computers including the Automated Teller Machines, etc. With the popularity of PCs, easy access to Internet and World Wide Web (WWW), banks increasingly use Internet as a channel for receiving instructions and delivering their products and services to their customers. This form of banking is generally referred to as Internet Banking, although the range of products and services offered by different banks

vary widely both in their content and sophistication (RBI, 2001).

Internet banking involves consumers using the Internet to access their bank account and to undertake banking transactions. At the basic level, Internet banking can mean the setting up of a Web page by a bank to give information about its product and services. At an advance level, it involves provision of facilities such as accessing accounts, funds transfer, and buying financial products or services online. This is called ``transactional'' online banking (Sathye, 1999).

There are two ways to offer Internet banking. First, an existing bank with physical offices can establish a web site and offer Internet banking in addition to its traditional delivery channels. Second, a bank may be established as a “branchless,” “Internet only,” or “virtual” bank without any physical branch. Broadly, the levels of banking services offered through INTERNET can be categorized in three types: (i) The Basic Level Services use the banks’ websites which disseminate information on different products and services offered to customers and members of public in general. It may receive and reply to customers’ queries through e-mail, (ii) In the next level are Simple Transactional Websites which allow customers to submit their instructions, applications for different services, queries on their account balances, etc, but do not permit any fund-based transactions on their accounts, (iii) The third level of Internet banking services are offered by Fully Transactional Websites which allow the customers to operate on their accounts for transfer of funds, payment of different bills, subscribing to other products of the bank and to transact purchase and sale of securities, etc. (RBI, 2001)

Most of the banks providing Internet banking products and services offer, to a large extent, an identical and standard package of banking services and transactional capabilities. In general, Internet banking products are offered in a two-tiered structure. A basic tier of Internet banking products includes customer account inquiry, funds transfer and electronic bill payment. A second or premium tier includes basic services plus one or more additional services. The list of Internet banking products and services is not inclusive.

Basic: 1) Account inquiry. 2) Funds transfer. 3) Electronic bill presentment and payment.

Premium: 1) Brokerage. 2) Cash management. 3) Credit applications. 4) Credit and debit cards. 5) Customer correspondence. 6) Demat holdings. 7) Financial advice 8) Foreign exchange trading. 9) Insurance. 10) Online trading. 11) Opening accounts 12) Requests and intimations. 13) Tax services. 14) E-shopping. 15) Standing instructions. 16) Investments. 17) Asset management services etc.

Evolution of Internet Banking In India

Indian banking industry, today, is in the midst of an IT revolution. The technology changes have put forth the competition among the banks. This has led to increasing total banking automation in the Indian banking industry. New private sector banks and foreign banks have an edge over public sector banks as far as implementation of technological solutions is concerned. However, the later are in the process of making huge investment in technology.

The financial reforms that were initiated in the early 90s and the globalization and liberalization measures brought in a completely new operating environment to the banks. Services and products like “Anywhere Banking,” “Tele-Banking,” “Internet Banking,” “Web Banking,” “E-Banking” etc. have become the buzzwords of the day and the banks are trying to cope with the competition by offering innovative and attractively packaged technology based services to their customers.

Like most of other activities in banking RBI also set up two committees in quick succession to accelerate the pace of automation of operations in the banking sector. In the early 80s, a high level committee was formed under the chairmanship of Dr. C. Rangarajan, then Governor of RBI, to draw up a phased plan for computerization and mechanization in the banking industry over a five year time frame of 1985-89. The focus by this time was on customer service and two models of branch automation were developed and implemented. Having gained experience in the earlier mode of computerization, the second Rangarajan committee constituted in 1988 drew up a detailed perspective plan for computerization of banks and for extension of automation to other areas like funds transfer, e-mail, BANKNET, SWIFT, ATMs, Internet banking etc.

The Government of India enacted the Information Technology Act, 2000, generally known as IT Act, 2000, with effect from the 17th October 2000 to provide legal recognition to electronic transactions and other means of Electronic Commerce. Reserve bank of India had set up a ‘Working Group on Internet Banking’ to examine different aspects of Internet banking (I-banking). The Group had focused on three major areas of I-banking i.e., (i) technology and security issues, (ii) legal issues and (iii) regulatory and supervisory issues. RBI had accepted the recommendations of the Working Group and accordingly issued guidelines on *Internet banking in India* for implementation by banks. The Working Group has also issued a report on Internet banking covering different aspects of I-banking.

Considerable progress has been made in consolidating the existing payment systems and in upgrading technology with a view to establishing an efficient, integrated and secure system functioning in a real-time environment. Major projects under implementation are electronic clearing, centralized funds management, structured financial messaging solutions and the Indian Financial Network (INFINET). Facilities under Electronic Funds Transfer (EFT) have been upgraded and their spatial reach expanded with multiple settlements in a day. Foreign exchange clearing has been initiated through the Clearing Corporation of India Limited (CCIL).

Adequate security features are being incorporated into the EFT. Preparatory work for the real time gross settlement (RTGS) is complete. (RBI, 2001)

As per an Internet survey conducted by NASSCOM the Indian Internet market grew steadily in terms of subscribers. There is a growth of 30% in March 2002 compared to the 1.1 million active subscriber base in March 2001. The survey also forecasts that the number of Internet subscribers in the year 2004-05 is likely to reach 7.7 million, with the user base to grow over 50 million. India's Internet user base is growing at a rapid pace. India's Internet population grows to 29 million by March 2003 from 10.7 million in 2002. Banking and finance market has got the largest share i.e. 21 percent among the other sectors of economy in using information technology. Thus there is a lot of scope for banking institutions to expand their Internet banking services to have a more sophisticated customer base.

Private and foreign banks have been the early adopters of e-banking while the Public sector banks are also beginning to hold on to the competition. ICICI Bank and HDFC Bank have taken a lead in introducing e-banking in India. ICICI Bank is the first one to have introduced Internet banking for a limited range of services such as access to account information; correspondence for the first time in 1996 and recently, funds transfer between its branches (Rajneesh and Padmanabhan, 2002). ICICI is also getting into e trading, thus offering a broader range of integrated services to the customer. Other banks also followed the suit. However, 1996-98 was the period of Internet banking adoption while the Internet banking usage gained importance only in 1999. After ICICI, Citibank, IndusInd Bank and HDFC Bank were the early ones to adopt the technology in 1999. This paper is confined to the study of Internet banking services offered by private, public and foreign banks operating in India.

Further discussion has been divided into six sections. Section One appraises the current literature. Section Two describes the database and research methodology designed for the study. Section Three depicts the present status and profile of banks offering Internet banking in India along with a description of the number and size distribution of private, public and foreign banks offering Internet banking. This section also provides information on the nature of the Internet banking products and services offered by Internet banks in India. Section Four compares the performance of banks offering Internet banking to those of other banks. Section Five explains an empirical test of whether offering Internet banking affects bank profitability. Section Six, the final section, summarizes the major findings.

Section One

Review of Literature

In India not many studies have been conducted on the current status of Internet banking. Thus almost no literature is available on this subject in India. Therefore this paper reflects the current status of Internet banking by Indian private, public and foreign banks operating in India. There are numerous papers that sought to study the growth of Internet banking internationally, for instance, Sathye (1997) surveyed the status of Internet banking in Australia. The study found that only two of the 52 banks started Internet banking services at that time. However still there was a lot of room for Internet banking to expand in Australia.

Booz Allen Hamilton (1997) conducted a global survey covering 386 retail and corporate banking institutions in 42 countries to assess the strategic impact of Internet banking on the financial service industry. According to the study, there is a huge perception gap between North American/European banks and Japanese banks regarding the future of Internet banking. North American and European banks expect Internet banking to become the most important retail channel within 10 years, but Japanese banks expect traditional branches to remain the most important channel. The study also indicates the rapid growth potential of Internet banking. Many of the banks that responded have plans to upgrade the functionality of their Internet service offerings.

Egland (1998) conducted the first important study that estimated the number of U.S. banks offering Internet banking and analyzed the structure and performance characteristics of these banks. They have found no evidence of major differences in the performance of the group of banks offering Internet banking activities compared to those that do not offer such services.

Furst et. al. (1998) a U.S. based study found out a significant shift by consumers and businesses to electronic payments. In response to developments in electronic payments and remote banking, banks have greatly increased their investment in technology, particularly in retail banking. The gains from technological advancements in banking and payments are likely to be substantial, both from the point of view of individual financial institutions and economy-wide. In this environment, banks should review and, if necessary, adjust their risk management practices in tandem with upgrading their technology activities.

Diniz (1998) reported a survey of web sites of banks in USA. It was found that most of the bank websites were basic and intermediate level. No website was found to be of advanced level.

Furst et. al. (2000) presented data on the number of national banks in U.S. offering Internet banking and the products and services being offered. Only 20 percent of national banks offered Internet banking in the third quarter of 1999. However, as a group, these ‘‘Internet banks’’ accounted for almost 90 percent of national banking system assets, and 84 percent of small deposit accounts. Banks in all size categories offering Internet banking tend to rely less on interest-yielding activities and core deposits than do non-Internet banks. Also, Institutions with Internet banking outperformed non- Internet banks in terms of profitability.

Sullivan (2000) found that Internet banks in 10th Federal Reserve District incurred higher expenses but also generated higher fee income and concluded that the measures of profitability for Internet banks are similar to those of the non-Internet banks.

Guru et. al. (2000) examined the various electronic channels utilized by the local Malaysian banks and also accessed the consumers' reactions to these delivery channels. It was found that Internet banking was nearly absent in Malaysian banks due to lack of adequate legal framework and security concerns. However over 60 percent of the respondents were having Internet access at home and thus represented a positive indication for PC based and Internet banking in future.

DeYoung (2001a) investigated the performance of Internet-only banks and thrifts in the U.S. The empirical analysis found that the newly chartered Internet-only banks substantially underperform the established banks at first, but these performance gaps systematically diminish over time as new banks grow older and larger. The study suggested that the Internet-only banking model may be feasible when executed efficiently.

DeYoung (2001b) found that the average one year old Internet-only bank earned significantly lower profits than the average one year old branching bank, due to low business volumes and high non-interest expenses. It supports the proposition regarding the Internet-only banks, "fast growth but low (or no) profits."

Jasimuddin (2001) found that within one year of the introduction of Internet service in Saudi Arabia, Saudi banks had at least decided on their Internet presence. 73% of the Saudi banks possessed their own web sites and 25% of the web sites were offering full services over Internet. The banks viewed the Internet as a key alternative delivery channel.

Suganthi et. al. (2001) conducted the review of Malaysian banking sites and revealed that all domestic banks were having a web presence. Only 4 of the ten major banks were with transactional sites. The remaining sites were at informational level. There are various psychological and behavioral issues as trust, security of Internet transactions, reluctance to change and preference for human interface which appear to impede the growth of Internet banking

Furst et. al. (2002) provided a comparative study of Internet and non-Internet banks in U.S. and found that institutions with Internet banking outperformed non-Internet banks in profitability. Also, banks in all categories of size offering Internet banking tended to rely less on interest yielding activities and deposits than non-Internet banks do.

Koedrabruen et. al. (2002) investigated, designed and developed an Internet based retail banking prototype that meets the requirements of the Thai customers. It found that more than half of the sample Internet users in Thailand are very interested in using the Internet banking services. The main features needed are balance inquiry, bill payment, fund transfer, business information, and payment for goods purchased. The prototype was then developed and validated. The survey from the executives of four Thai banks revealed that there was a potential growth for retail Internet banking in Thailand.

Corrocher (2002) investigated the determinants of the adoption of Internet technology for the provision of banking services in the Italian context, and also studied the relationship between the Internet banking and the traditional banking activity, in order to understand if these two systems of financial services delivery are perceived as substitutes or complements by the banks. From the results of the empirical analysis, banks seem to perceive Internet banking as a substitute for the existing branching structure, although there is also some evidence that banks providing innovative financial services are more inclined to adopt the innovation than traditional banks.

Hasan (2002) found that online home banking has emerged as a significant strategy for banks to attract customers. Almost 75 percent of the Italian banks have adopted some form of Internet banking during the period 1993-2000. It also found that the higher likelihood of adopting active Internet banking activities is by larger banks, banks with higher involvement in off-balance sheet activities, past performance and higher branching network.

Janice et. al. (2002) based on interviews with four banks in Hong Kong noted that banks view the Internet as being a supplementary distribution channel for their products and services in addition to other forms of distribution channels such as Automated Teller Machines (ATMs), phones, mobile phones and bank branches. Basic transactions and securities trading are the most popular types of operations that customers carry out in Internet banking.

Lustsik (2003) based on the survey of experts of e-banking in Estonian banks found that Estonia has achieved significant success in implementation of e-banking and also on the top of the list in emerging countries. All the major banks are developing e-business as one of the core strategies for future development.

Awamleh et. al. (2003) found that banks in Jordan are not fully utilizing concepts and applications of web banking. In comparison to developed international markets, it is fair to say that this sector is largely undeveloped. Indeed, only two banks offered limited number of services through their web. The major challenge facing further development of web banking in Jordan is, for example, the high cost of telecommunication. Another element is the non-availability of information technologies, packages, solutions, and human resources, which facilitates optimum use of technology. The study revealed that Jordanian banks have been successful in the introductory phase of web banking. However Jordanian banks are required to move towards web banking usage with a view to conducting real financial transactions and improving electronic customer relations.

There are a series of papers that observe that Internet banking has revolutionized the banking industry and the banking industry is

under pressure to offer new products and services. However, to succeed in today's electronic markets a strategic and focused approach is required.

In the Indian context many publications throw light over the importance of Internet banking and also its prospects for the Indian banking industry. However these papers don't identify key differences between Internet banks and non-Internet banks.

Unnithan et al. (2001) studied the drivers for change in the evolution of the banking sector, and the move towards electronic banking by focusing on two economies – Australia and India. The paper found that Australia is a country with Internet ready infrastructure as far as telecommunication, secure protocols, PC penetration and consumers' literacy is concerned. India, by comparison, is overwhelmed by weak infrastructure, low PC penetration, developing security protocols and consumer reluctance in rural sector. Although many major banks have started offering Internet banking services, the slow pace will continue until the critical mass is achieved for PC, Internet connections and telephones. However, the upsurge of IT professionals with growing demands is pressuring the government and bureaucracy in the country to support and develop new initiatives for a faster spread of Internet Banking. The economy is classically "the catch-up" one, trying to develop and catch up with leading economies.

Rao et. al. (2003) provided a theoretical analysis of Internet banking in India and found that as compared to banks abroad, Indian banks offering online services still have a long way to go. For online banking to reach a critical mass, there has to be sufficient number of users and the sufficient infrastructure in place.

Agarwal et. al. (2003) explored the role of e-banking in e-democracy. With the development of asynchronous technologies and secured electronic transaction technologies, more banks and departments were using Internet for transactional and information medium. Initiatives such as E-SEVA and FSC's are the milestones towards achieving comprehensive e-governance.

Mookerji (1998), Pegu (2000), Gupta (1999) and Dasgupta (2002) found that Internet banking is fast becoming popular in India. However, it is still in its evolutionary stage. By the year 2005, a large sophisticated and highly competitive Internet banking market will develop. Almost all the banks operating in India are having their websites but only a few banks provide transactional Internet banking.

The purpose of this paper is to describe the current state of Internet banking in India and also identifies key differences between Internet banks and non-Internet banks with special reference to commercial banks operating in India. The study is based on the survey of websites of the banks only. E-mail correspondence was also conducted with the experts of the banks.

Section Two

Data Base and Research Methodology

The present study is an attempt to examine the performance of Indian banks in terms of providing banking products and services through their Web sites. This section explains in detail the objectives, period and sample of the study.

2.1 Objectives of the Study

The purpose of this paper is to help fill significant gaps in knowledge about the Internet banking landscape in India. The paper presents data, drawn from a survey of commercial banks websites, on the number of commercial banks that offer Internet banking and on the products and services they offer. It investigates the profile of commercial banks that offer Internet banking, using univariate statistical analysis, relative to other commercial banks with respect to profitability, cost efficiency, and other characteristics.

A search was executed on the World Wide Web using a combination of knowledge of Web sites and search tools (predominately the www.google.com) to discover the 'home pages' (main Web sites) of the 93 banks comprising 30 Private, 27 Public and 36 foreign banks.

2.2 Period of the Study

The period chosen for the study is Q1 2004. All the Web sites of the banks have been explored during this period. The financial data for the purpose of making comparative analysis relates to 2002-03 as the data relating to 2003-04 is not available.

2.3 Universe of the Study

The universe of the study consists of all scheduled commercial banks operating in India. There are 289 scheduled commercial banks operating in India as on 31st March 2004. Scheduled commercial banks comprise 27 Public Sector banks, 30 Private Sector banks, 36 foreign banks and 196 Regional Rural banks.

2.4 Sample of the Study

For the purpose of the study a sample of 93 banks is considered, out of which 36 are foreign banks, 27 are public sector banks

and 30 are private sector banks. The sample consists nearly 32 percent of the universe. In case of foreign banks, only those banks are studied which provide Internet banking in India. However the foreign banks, providing Internet banking in India but the Internet banking services of which are not accessible at their websites due to language problem or the other, are excluded for the purpose of studying the services and products being offered by Internet banks in India.

2.5 Design For Data Collection

The data for this study are unique in several respects. First, the data cover the Internet banking offerings of every commercial bank. Secondly, the information was compiled from the websites of the respective banks between mid-December 2003 and March end 2004 for 289 scheduled commercial banks. Data is although confined to commercial banks only; the data are broadly applicable to the banking system at large. As of March end 2004, commercial banks accounted for 32 percent of all banks and 96 percent of all banking system assets.

Various Internet banking services are considered for the purpose of making comparative analysis and ranking of private, public and foreign banks. The Internet banking services have been classified into two major categories:

1) BASIC Internet banking is defined as the three core Internet banking services: balance enquiry, funds transfer and bill payment.

2) PREMIUM Internet banking is defined as BASIC plus at least three other services. However for the purpose of this paper 30 services have been included.

2.6 Limitations of the Study

1. The sample taken for the purpose of study comprises only commercial banks operating in India.

2. Only important products and services of Internet banking are studied. The Internet banking products and services used for this study are not concluding.

3. The information about the various services and products of Internet banking being offered by the banks in India has been explored from the web sites of the banks only. No other information source has been availed. Whatever the information was available on the websites of the banks has been used for the purpose of present study.

Section Three

Analysis of Internet Banking in India

In India, slowly but steadily, the Indian customer is moving towards Internet banking. A number of banks have either adopted Internet Banking or are on the threshold of adopting it. The banks started Internet banking initially with simple functions such as getting information about interest rates, checking account balances and computing loan eligibility. Then the services were extended to online bill payment, transfer of funds between accounts and cash management services for corporate. Recently, banks have started to facilitate payment for e-commerce transactions by directly debiting bank accounts or through credit cards. It will add to the revenues of the banks.

3.1 Profile of Banks

Presently there are 30 private sector banks (21 old and 9 new), 27 public sector banks and 36 foreign banks operating in India. The paper studies the current state of Internet banking services offered by private, public and foreign banks operating in India. Almost all the banks are having websites; however, only 48 banks are providing transactional banking services in one form or the other which represents nearly 17 percent of total Scheduled commercial banks operating in India. Table 3.1 and 3.2 shows the adoption rates of the Internet banks.

Table 3.1

Internet Banking and Scheduled Commercial Banks

	Number	**Percentage of All Scheduled Commercial Banks (289)**
Banks with Web Sites	90	31.1

Banks with Transactional Sites	48	16.6

Table 3.2
Adoption Rates of Internet Banks

(As on March 31, 2004)

	Number of Banks	Number of Banks With Websites	Number of Banks With Transactional Sites
Private Sector Banks	**30**	**28**	**15 (50.0)**
New*	9	9	9 (100.0)
Old**	21	19	6 (28.6)
Public Sector Banks	**27**	**27**	**13(48.1)**
Foreign Banks	**36**	**35**	**20(55.6)**
All Banks	**93**	**90**	**48 (51.6)**

Source: Websites of the individual banks available at www.banknetindia.com/banklinks.htm (accessed during December, 2003 to March 2004)

Figures in bracket denote percentage.

* includes banks established after the liberalization reforms as recommended by Narsimham Committee in 1991.

** includes banks established before the liberalization reforms as recommended by Narsimham Committee in 1991.

Table 3.3

Classification of Internet Banking Websites

	Entry Level Websites*	Transactional Websites		Total Number of Bank Websites
		Partly Transactional**	Fully Transactional***	
All Banks	**42**	**14**	**34(36.6%)**	**90**
Foreign banks	**15**	**0**	**20(55.6%)**	**35**
Private Sector Banks	**13**	**5**	**10(33.3%)**	**28**

Public Sector Banks	**14**	**9**	**4 (14.8%)**	**27**

*Entry Level Internet Banks include those banks which are not providing any transactional service.

**Partly transactional Internet banks include those banks providing less than BASIC services.

***Fully transactional Internet banks include those banks providing BASIC plus PREMIUM services of Internet banking.

Figures in bracket denote the percentage of number of fully transactional web sites to total number of commercial banks in India.

As evidenced from Table 3.2, number of banks offering Internet banking services in one form or the other are 48, however, only 34 banks provide Internet banking in true sense which represents only 36 percent of total commercial banks (Table 3.3). Out of total public sector banks nearly 15 percent banks offer fully transactional banking services while 33 percent of private sector banks and 55 percent of foreign banks are offering fully transactional Internet banking services.

Table 3.4

Position of Foreign banks providing Internet Banking in India

No. of Banks	Banks with Web sites	Banks providing Internet banking	Banks providing Internet Banking in India	Accessible Web sites
36	35	25	20	16

There are 25 foreign banks offering Internet banking services in different countries in one form or the other. However, the Internet banking services of four foreign banks out of 20 which are providing Internet banking services in India were not accessible through their websites either due to language problem or the other. As all the 16 banks offering internet banking services in India are fully transactional banks therefore it was assumed that the other 4 banks are also fully transactional banks. However for the purpose of studying the range of services offered by Internet banks in India in the present study, only 16 foreign banks were studied.

Although only a minority of banks offers Internet banking, as Table 3.5 shows, the banks offering these services accounted for most of the assets in the Indian commercial banking system. As a group, transactional Internet banks had, on average, 187 percent more assets, 115 percent more employees, and 60 percent more offices and 157 percent more deposits than non-Internet national banks.

Table 3.5

Comparison of Key Attributes of Internet Banks and Non-Internet Banks

	Transactional Internet Banks	Non-Internet Banks*
Average Size (assets in Rs crores)	23970.17	8336.788
Average Number of Offices per Bank	698	436

Average Number of Employees	12179	5645
Deposits	18252.74	7096.749
	Transactional Internet banks as a Percentage of all commercial banks* **	
Number of Banks	51.6	
Assets**	75.4	
Deposits	73.3	

Source: www.rbi.org.in

*Includes banks with non transactional web sites.

** Rupees value of assets.

***excluding Regional Rural banks.

3.2 Range of Services Offered by Transactional Internet Banks

As shown in Table 3.6, nearly 68 percent of the transactional banks provide BASIC services of Internet banking. 96 percent of the transactional banks provide account balance enquiry service. More than 70 percent of the transactional banks offer the services of funds transfer between accounts and electronic bill payment. However foreign transactional banks are more likely to provide these services as compared to private and public transactional banks. More number of Foreign and private banks also provide third party fund transfer facility as compared to public sector banks.

A look at Internet banking services beyond balance enquiry, funds transfer and bill payment reveals the pattern of what is offered by banks of different categories. As far as the services of providing customer correspondence are concerned there is no difference among the banks.

Nearly 41 percent of the banks provide the service of new account set up. However private sector and public sector banks lag behind foreign banks in providing this service. Similarly in respect of the services of online trading, Demat holdings and E-shopping the private sector banks out performed the foreign as well as public sector banks. It is a determinant of how well the private sector banks compete with the foreign and public sector banks for business customers.

Table 3.6 also contains information on the extent to which particular business lines- loan applications, credit card payment, financial planning, online insurance, brokerage, financial planning, linking of accounts i.e. one can view all the accounts in the same bank in one statement, providing market news and net worth statement online and investment trading- were offered. A large number of foreign banks offer these services than the private and public sector banks.

Table 3.6

Range of Services Offered by Transactional Internet Banks

(Percentage of transactional banks offering selected services)

Service Code	Type of service	All banks	Foreign sector Banks	Private Sector Banks	Public Sector Banks

1.	Balance Enquiry	95.5	100.0	93.3	92.3
2.	Funds Transfer	77.3	100.0	86.7	38.5
3.	Bills Payment	75.0	100.0	73.3	46.2
4.	Third Party Transfer	45.5	50.0	53.3	30.8
5.	opening accounts	40.9	75.0	26.7	15.4
6.	Receive Alerts	29.5	31.25	40.0	15.4
7.	Requests& Intimations	79.5	68.75	93.3	76.9
8.	Cash Management Online	9.1	6.25	6.7	15.4
9.	E-Shopping	38.6	43.75	53.3	15.4
10.	Credit Card Payment	22.7	31.25	13.3	23.1
11.	Standing Instructions	81.8	68.75	93.3	84.6
12.	Loan Applications	29.5	43.75	33.3	7.7
13.	Customer Correspondence	100.0	100.0	100.0	100.0
14.	Insurance	6.8	12.5	6.7	0.0
15.	Demat Holdings	25.0	18.75	53.3	0.0
16.	Brokerage	4.5	6.25	6.7	0.0
17.	Investments	22.7	37.5	26.7	0.0
18.	Online Remittance of Funds	11.4	12.5	20.0	0.0
19.	Tax advisory service	13.6	6.25	33.3	0.0
20.	Financial Planning	34.1	56.25	40.0	0.0
21.	Linking A/cs Online	4.5	6.25	6.7	0.0
22.	Market News Online	6.8	12.5	6.7	0.0
23.	Trading Online	18.2	25.0	26.7	0.0

24.	Foreign Exch. Trading	2.3	0.0	6.7	0.0
25.	Foreign exch. Rates update	27.3	50.0	20.0	7.7
26.	Tds Enquiry	9.1	6.25	20.0	0.0
27.	One View a/c	4.5	6.25	6.7	0.0
28.	Net Worth Statement	4.5	12.5	0.0	0.0
29.	Privacy Statement	84.1	87.5	100.0	61.5
30.	Demonstration of I-Banking	65.9	75.0	60.0	61.5
	BASIC*	68.2	100.0	66.7	30.8
	PREMIUM**	68.2	100.0	66.7	30.8

Source**:** Websites of respective banks available at

www.banknetindia.com/banklinks.htm (accessed during December, 2003 to March, 2004)

***BASIC includes balance enquiry, funds transfer and bill payment.

**PREMIUM includes BASIC and at least three other services.

However foreign transactional banks are inefficient in providing the services like Demat holdings, E-shopping and the services of providing standing instructions and handling requests and intimations. However there are some new Internet banking services which are offered by foreign banks including recurring transfer of funds between the accounts, providing the net worth statement to the customers and the services of financial planning. The position of public sector banks is worst in case of providing the range of internet services and products. No public sector bank provide the services of Demat Holdings, Brokerage, Investments, Online Remittance of Funds, Tax advisory service, Financial Planning, Linking A/cs, Online Market News, Online Trading, Foreign Exch. Trading, Tds Enquiry, One View a/c and providing Net Worth Statement.

Nearly 75 percent of the foreign transactional banks provide demonstration of the internet banking on their web sites. While 60 percent of private and nearly 62 percent of public sector banks did so. All the transactional banks provide customer correspondence for the purpose of gaining new and retaining their existing online customers.

To gain a clear picture of the range of Internet services available at banks of different sizes, two “menus” of Internet banking services are defined. BASIC Internet banking is defined as the three core Internet banking services: balance enquiry, funds transfer and bill payment. PREMIUM Internet banking is defined as BASIC plus at least three other services. Foreign banks are offering BASIC as well as PREMIUM Internet banking services. All the foreign transactional banks provide BASIC as well as PREMIUM Internet banking products. While only 67 percent of the private transactional banks and 31 percent of public transactional banks offer PREMIUM and BASIC Internet banking services.

The major concern for the adoption of Internet banking presently is the level of security or risk associated with it. Both banks and customers stand to benefit from the collection and integration of large amounts of personal information over the Internet that enhance the ability of the banks to offer a wide range of products according to the individual demands. But the collection, analysis and distribution of information raise questions related to protecting personal privacy. A fundamental step many banks are taking to address on-line privacy is to post a statement of their policies about the collection and use of customer information. The database includes information on the number of transactional banks that had such a statement on their web sites.

Table 3.6 shows that most of the transactional banks included a privacy policy statement on their web sites. Indeed, 100 percent of the private sector banks include privacy statement on their web sites. And nearly 88 percent of the foreign banks and 62 percent of public sector banks did so.

Section Four

Internet and Non-Internet Banks: Comparison of Performance

This chapter makes the use of univariate comparisons between Internet and non-Internet bank characteristics. In comparing transactional Internet banks to non-Internet banks, as Tables 4.1, 4.2, and 4.3 illustrate, by Q1 2004 differences between Internet and non-Internet banks had begun to emerge in funding, in sources of income and expenditures and in measures of performance. For each pair of observations in a table, a probability (p) value is provided for the hypothesis that the means in the Internet and non-Internet samples are the same. A lower p-value indicates a greater likelihood that the two figures compared represent real differences between categories of banks (Internet vs. non-Internet, etc.).

4.1 Financing Pattern, Income and Expenses

Table 4.1 shows major financing characteristics of Internet and non-Internet banks. Overall, Internet banks generally are less reliant on core deposits for funding and make greater use of purchased funds relative to deposits. However, the difference is significant in case of private sector banks only.

Table 4.1

Financing Pattern of Internet and Non-Internet Commercial Banks

	Financing Pattern (in percent)	
	Deposits / Assets	**Purchased Funds / Deposits**
Private Sector Banks		
Internet Banks	65.0	27.1
Non-Internet Banks	87.8	1.6
p-value	(0.29)	(0.10)*
Public Sector Banks		
Internet Banks	83.1	2.3
Non-Internet Banks	86.3	1.6
p-value	(0.94)	(0.82)
Foreign Banks		
Internet Banks	60.0	33.0
Non-Internet Banks	56.7	33.0
p-value	(0.86)	(0.18)
All Banks		
Internet Banks	78.0	7.9
Non-Internet Banks	85.8	2.1
p-value	(0.41)	(0.11)

Source: www.rbi.org.in

Numbers in parentheses are p-values for the difference of means test for Internet and non-Internet bank values in each cell. *** Significant at the 1 percent or better level; ** significant at the 5 percent level; and * significant at the 10 percent level.

Non-Internet banks include banks with non-transactional Web sites.

Differences in the business strategies of Internet and non-Internet banks also are evident in Table 4.2. The first column shows the ratio of non-interest income to net operating revenue, which is a rough proxy for the amount of revenue generated by "nontraditional" activities. Internet banks generated a substantially higher proportion of their income—roughly speaking, about 40 percent more—from non-traditional activities compared to non-Internet banks. This pattern is consistent with a business strategy of using the Internet to target businesses and more affluent consumers, with the belief that these customers will be interested not only in loans but also in other services that yield fee income.

In addition to revenue enhancement, Internet banking may enable banks to reduce costs of operation, in particular, by allowing them to reduce expenditures on premises and fixed assets. To the extent this may be so, Internet banking could be considered a *causal* factor in generating lower expenses related to maintaining physical branches. On the other hand, banks with relatively high expenses in maintaining their branch networks may be expected to have the greatest incentive to adopt Internet banking. The adoption of Internet banking would thus be the effect of existing characteristics of banks.

The data in Table 4.2 show that, consistent with the first hypothesis, Internet banks in public sector and foreign sector had lower expenses for building and equipment relative to net operating revenue. Among the private sector Internet banks, building and equipment expenditures were higher than for non-Internet banks. This difference may indicate that private sector banks with high costs of maintaining a branch network are motivated to adopt Internet banking by the prospect of future cost savings.

Table 4.2

Income and Expenses

	Non-Traditional Income (in percent)	**Expenses**
	Non-Interest Income/ Net Operating Revenue	**Premises & Fixed Assets / Net Operating Revenue**
Private Sector Banks		
Internet Banks	53.8	78.5
Non-Internet Banks	45.1	24.1
p-value	(0.51)	(0.11)
Public Sector Banks		
Internet Banks	36.3	17.4
Non-Internet Banks	36.4	19.8
p-value	(0.31)	(0.64)
Foreign Banks		
Internet Banks	45.0	30.5
Non-Internet Banks	34.5	41.2
p-value	(0.38)	(0.36)
All Banks		
Internet Banks	40.0	28.1
Non-Internet Banks	37.7	21.0
p-value	(0.44)	(0.55)

Source: www.rbi.org.in

Numbers in parentheses are p-values for the difference of means test for Internet and non-Internet bank values in each cell. *** Significant at the 1 percent or better level; ** significant at the 5 percent level; and * significant at the 10 percent level.

Non-Internet banks include banks with non-transactional Web sites.

However most of the private Internet banks are established after the liberalization process started in 1991. Newness may also be the reason for high cost of building and equipment expenditures. Further research can establish whether Internet banking is likely to reduce costs associated with physical branch networks, and whether relatively high branch-related expenses are a causal factor in the adoption of Internet banking.

4.2 Performance Analysis

Table 4.3 compares the profitability, efficiency, and credit quality of Internet banks compared to non-Internet banks as on March 31, 2004. Internet banks in foreign sector are more profitable than non-Internet banks; however, Internet banks in the private sector are significantly less profitable than non-Internet banks. The Internet banks in public sector are also less profitable than non-Internet banks. However there is no significant evidence. Internet banks in private sector also are less efficient than non-Internet banks, as measured by the ratio of noninterest expense to net operating revenue ("accounting efficiency"), a commonly used measure of cost efficiency.

There was no statistically significant difference between the accounting efficiency of Internet and non-Internet banks in all categories. Internet banks don't have better credit quality than non-Internet banks. There is no significant difference between the credit quality of Internet and non-Internet banks, as measured by the ratio of non-current loans to total loans.

Table 4.3

Comparison of Performance of Internet Banks and Non-Internet National Banks

(Q1 2004)

	Profitability (in percent)	**Accounting Efficiency (in percent)**	**Credit Quality (in percent)**
	Return on Equity	**Non-Interest Expense to Net Operating Revenue**	**Non-Current Loans to Total Loans**
Private Sector Banks			
Internet Banks	14.0	54.2	71.1
Non-Internet Banks	21.6	41.0	39.0
p-value	(0.083)*	(0.719)	(0.189)
Public Sector Banks			
Internet Banks	18.4	49.0	39.1
Non-Internet Banks	19.7	50.4	39.8
p-value	(0.945)	(0.714)	(0.828)
Foreign Banks			
Internet Banks	16.0	45.5	48.5
Non-Internet Banks	0.1	59.7	45.8.

p-value	(0.268)	(0.721)	(0.807)
All Banks			
Internet Banks	17.2	49.3	46.1
Non-Internet Banks	18.3	49.2	39.8
p-value	(0.282)	(0.713)	(0.463)

Source: www.rbi.org.in

Numbers in parentheses are p-values for the difference of means test for Internet and non-Internet bank values in each cell. *** Significant at the 1 percent or better level; ** significant at the 5 percent level; and * significant at the 10 percent level.

Non-Internet banks include banks with non-transactional Web sites.

Section Five

Impact of Internet Banking on Bank Profitability

Although, we find in our univariate analysis, overall lesser performance by banks in Internet group relative to non-Internet group, however, we know that it is hard to make any conclusive statement on the actual impact of the Internet adoptions on bank performance without a multivariate analysis. Thus, here a multivariate regression model is estimated to investigate whether there is a link between offering Internet banking and a banks' profitability. A banks' ROE as on Q1 2003 is regressed against control variables and a variable denoting whether or not a bank offers Internet banking.

A dummy variable INTERNET was created that equals 1 if the bank offered Internet banking in Q1 2004, and it is included as a regressor in explaining ROE. If Internet banking remains too small a factor to affect bank profitability, then the coefficient on this variable will not be statistically significant.

Table 5.1 presents the results of ordinary least-squares regressions using various regressors to explain ROE, both for all commercial banks (columns 1 through 3), private sector banks (columns 4 through 6), public sector banks (columns 7 through 9) and for foreign banks (columns 10 through 12). Column 1 enters only the INTERNET variable in the regression. This column reports only the simple correlation between Internet banking and profitability without controlling for other relevant factors. The results indicate no simple correlation between Internet banking and profitability. Columns 2 and 3 check whether the finding of no relationship between Internet banking and profitability is strong when controlling for factors commonly used in models estimating profitability. The control variables in specification 2 include total assets (ASSETS), the equity capital-to-assets ratio (CAPASSETS) and the loan-to-assets ratio (LOANASSETS). Column 3 expands the control variables to include the ratio of noninterest income to net operating revenue (NIINCOME), the ratio of expenditures on premises and fixed assets to net operating revenue (EXPENSES), the measure of accounting inefficiency (INEFFICIENCY), and the ratio of non-current loans to total loans (CREDQUAL). All the explanatory variables are measured as of March 31, 2003. Both columns indicate no relationship between the existence of Internet banking and profitability.

Column 4 is again the simple correlation between Internet banking and ROE for private sector banks. The result indicates significant correlation between Internet banking and profitability with a p-value of 5 percent. This significance remains even when other control variables are added in as shown in column 5. Column 5 follows Enter Method of Regression analysis. However the significance of internet banking disappears when all the control variables are entered in as shown in column 6. There is no correlation between Internet banking and profitability in case of public sector banks as well as foreign banks as shown by Columns 7 to 9 and columns 10 to 12 respectively.

Table 5.1

Determinants of Profitability: A Step-wise Regression Analysis

Dependent variable: Return on equity (ROE)

Variable	All Banks			Private Sector Banks			Public Sector Banks			Foreign Banks		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

INTERNET	-.11	-.10	-.10	-.321	-.40 (.05)**	-.05	-.01	-.02	-.05	.19	.04	.04
p-value	(.28)	(.32)	(.32)	(.08)**		(.72)	(.94)	(.88)	(.78)	(.26)	(.78)	(.78)
ASSETS		.16	.16		.16	.16		-.11	-.02		.45	.45
p-value		(.11)	(.11)		(.41)	(.27)		(.51)	(.88)		(.00)***	(.00)***
CAPASSETS		-.12	-.12		.22	-1.05		-.50	-.39		-.05	-.05
p-value		(.29)	(.29)		(.42)	(.00)***		(.00)***	(.03)**		(.74)	(.74)
LOANS		.20	.20		.22	-.08		.18	.28		.04	.04
p-value		(.04)**	(.04)**		(.41)	(.71)		(.38)	(.12)		(.79)	(.79)
NIINCOME			-.09			-.39			-.05			-.10
p-value			(.39)			(.03)**			(.76)			(.50)
EXPENSES			-.13			-.33			-.28			-.11
p-value			(.20)			(.08)*			(.16)			(.45)
INEFFICIENCY			-.17			-.74			-.46			-.22
p-value			(.09)*			(.02)**			(.01)***			(.13)
CREDQUAL			-.03			.22			-.00			-.14
p-value			(.75)			(.18)			(.97)			(.38)
Number of Observations	93	93	93	30	30	30	27	27	27	36	36	36
R Square	.01	.04	.04	0.103	.15	.56	.014	.25	.22	.03	.206	.206
F	1.17	4.08**	4.08**	3.22**	1.14	8.08***	.005	8.50***	7.04***	1.27	8.81***	8.81***

Source: www.rbi.org.in

Dependent variable: Return on equity (ROE).

*** Significant at the 1 percent or better level; ** significant at the 5 percent level; and * significant at the 10 percent level.

In nutshell it is concluded that the impact of internet banking is significant in case of private sector banks while it is insignificant in case of public and foreign sector banks. For all banks, Internet banking is not a significant determinant in explaining the profitability.

Section Six

Summary and Conclusions

The analysis indicates several significant differences in the profile of banks that offer Internet banking and banks that do not.

The main findings can be summarized as follows:

- Only 17 percent of scheduled commercial banks offered Internet banking in the first quarter (Q1) of 2004. However among the commercial banks 51.6 percent offered internet banking. As a group these Internet banks accounted for almost 75 percent of commercial banking system assets and 73 percent of deposits account.

- Among the public sector banks 48 percent of banks offered internet banking, however only 15 percent offered fully transactional internet banking. Among the private sector banks 50 percent of banks offered internet banking, however only 33 percent of banks are fully transactional banks. Similarly 55 percent of foreign banks offered internet banking and all are fully transactional banks.
- Foreign and private Internet banks offered a broad range of services over the Internet. Public sector banks lag behind in offering wider range of internet banking services and products.
- Overall, Internet banks generally are less reliant on core deposits for funding and make greater use of purchased funds relative to deposits. However, the difference is significant in case of private sector banks only.
- Internet banks generated a substantially higher proportion of their income from non-traditional activities compared to non-Internet banks. However there is no significant evidence to prove it.
- Overall internet banks were having higher premises and fixed assets expenditure. Thus banks with relatively high expenses in maintaining their branch networks may be expected to have the greatest incentive to adopt Internet banking. The private sector banks were having higher premises and fixed assets expenditure. However there is no statistical significance to show the relation between offering of internet banking and higher premises and fixed assets expenditure. A major reason of their less profitability may be the newness of the banks.
- Internet banks in foreign sector are more profitable than non-Internet banks; however, Internet banks in the private sector are significantly less profitable than non-Internet banks. The Internet banks in public sector are also less profitable than non-Internet banks.
- There is no statistical significant difference between the Internet and non-internet banks with respect to accounting efficiency and credit quality. However, private sector Internet banks are more efficient than private non-internet banks.
- For all banks, Internet banking is not a significant determinant in explaining the profitability. The impact of internet banking is significant in case of private sector banks only. Though the univariate analysis shows that the average ROE of private Internet banks is less than non-Internet banks, the difference may be attributed to high premises and fixed assets expenditure (EXPENSES), high non-interest expenses (INEFFICIENCY) and high non-current loans (CREDQUAL). However this significance also disappears when all the control variables are added in.
- Most of the growth in Internet banking in India is due to private sector and foreign banks operating in India.
- Most of the market is still untapped in India. There is a lot of scope for banking institutions to expand their Internet banking services to have a more sophisticated customer base.

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