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Evaluating the Impact of Electronic Banking on The Profitability of Select Public and Private Sector Banks

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Abstract:
E-banking is one significant innovation in the banking industry. Electronic banking typically uses electronic devices rather than paper documentation to grow the relationship and conduct business between banks and customers. Furthermore, electronic banking refers to the automated direct delivery of both new and current goods and services to customers through interactive communication channels and electronic channels. In the financial sector, e-banking has shown to be an important development. Individuals would be heavily reliant on checks and would insist on draft payments, which would result in long lines at bank branches and a significant waste of energy and time. E-banking is a blessing in these busy lives when individuals strive to balance work and life. Return on Equity/Net Worth, Return on Assets, Net Profit Margin, ATM Transactions, POS Transactions, and Mobile Banking were selected and considered for the study. This paper aims to provide an overview of India's current situation in Internet banking and highlights the influence of electronic banking on the profitability of Indian banks.

Key words: E-banking, Return on Equity, Return on Net worth, Net Profit Margin, Mobile banking, PoS, ATM, Profitability.

INTRODUCTION

Traditionally, due to the banks' proximity to customers, bank branches have historically been the distribution point for financial services and products due to their broad service offering, added value provided to customers at the branch, and a major influence on customer decisions. Despite this, a more flexible and dynamic channel has taken over traditional banking. Debit cards, credit cards, check writing, fund transfers, balance enquiries, fund deposits, account statements, utility bill payment, pay orders, drafts, remittances, drafts, mobile banking, online banking, and statement of account are just a few electronic banking services that the banks offer.

The banking sector is undergoing a transformation driven by factors such as client demands, competition, and globalization. The emergence of a knowledge-based economy and culture, along with the advancement of technology (ICT), have brought about significant transformations to banking services in recent times.

Every bank now considers the application of ICT concepts, techniques, policies, and implementation strategies to banking services to be of utmost importance. It is also a requirement for local and international

banking to remain competitive (Connel and Saleh, 2004). Business Standard (July 2024) states that India is accountable for almost 46% of the world's digital transactions. UPI is processing almost 420 million transactions every day and the share of digital payments has reached close to 80% in 2023.

REVIEW OF LITERATURE

1. **Aldasoro et al. (2021)** in their study "Covid-19 and cyber risk in the financial sector" stated that, since COVID-19, there has been a rise in cybercrime directed towards financial institutions. This increase can be attributed, in part, to work-from-home arrangements, a form of process innovation, increased use of digital banking channels, and an overall increase in internet usage.
2. In a report titled "Impact of Digital Banking on Profitability of Public and Private Sector Banks in India," **Vora Motwani (2021)** examined the profitability of e-banking services and how it affected the financial profitability of selected public and private sector Indian banks. In the study, regression and correlation analyses were carried out. The study concluded that the profitability of the bank is gradually decreasing.
3. In a study titled "Impact of e-banking on the profitability of commercial banks in India," **Saluja and Wadhe (2015)** examined the profitability of 31 scheduled commercial banks in India between 2006 and 2014 using multiple regression analysis. The study looks at the association between E-banking and banks' profitability. The results demonstrate that e-banking significantly affects the profitability of both nationalized and traditional private-sector banks.
4. **Al-Smadi et al. (2011)** have taken up a study on "The Impact of E-Banking on the Performance of Jordanian Banks" and examined how E-banking affected the profitability of Jordanian banks between 2000 and 2010. The financial reports of fifteen banks were collected and annual reports of the Central Bank of Jordan are the main data sources for this study. The OLS regression technique was used in this study. It was analyzed that, based on the value of the tolerance and variance inflation factors, there is very low multicollinearity among the variables. The computed t-value for e-banking, size of the bank, credit risk, liquidity of the bank, and economic growth are significant at the 10%, 5%, and 1% levels. The study concluded that the implementation of e-banking has a negative impact on bank performance.
5. **Sumra et al. (2011)** presented a paper on "The Impact of E-Banking on the Profitability of Banks: A Study of Pakistani Banks". The paper conducts a qualitative analysis covering twelve banks in Pakistan. The interview results indicate that banks do not perceive customer literacy as a barrier to their objective of generating new customers, satisfying existing ones, and increasing profitability. After collecting data from different bank managers, the researchers evaluated it and found that, in comparison to the past, banking has grown faster, customers receive services more promptly and reliably, and local and international transactions take much less time.
6. **Onay et al. (2008)** presented a paper on "Internet has changed the dimensions of competition in the retail banking sector,". This study found that e-banking increases a bank's profits. Additionally, it has given developing nations the chance to expand their infrastructure for financial intermediation. The process of investing in e-banking is gradual. Online banking has helped Turkey's banking system operate better.

OBJECTIVES OF THE STUDY

1. To study the profitability of select Indian public and private sector banks.
2. To discuss various electronic banking services of select Indian public and private sector banks.

3. To analyze the impact of electronic banking services on the profitability of select Indian public and private sector banks.

HYPOTHESIS

H_{01}: There is no significant impact of the volume of ATM, PoS, and Mobile banking transactions on the Net Profit Margin of the selected banks.

H_{02}: There is no significant impact of the volume of ATM, PoS, and Mobile banking transactions on the Return on Assets of the selected banks.

H_{03}: There is no significant impact of the volume of ATM, PoS, and Mobile banking transactions on the Return on Equity of the selected banks.

RESEARCH METHODOLOGY

- **Sources of data:** The data for this study is collected from secondary sources. Necessary data was collected from the websites of various banks, RBI, and Money Control.
- **Period of the study:** The study's five-year timeframe is from **2019–20** until **2023–24**.
- **Tools used for the analysis**: Ratio Analysis, Correlation Analysis, Regression Analysis.
- **Sample size:** The following table shows the list of four public sector banks and four private sector banks which are chosen as the sample size for the study.

Table 1: List of banks chosen for the study:

Public sector banks	Private sector banks
State Bank of India (SBI)	Axis Bank (AXIS)
Bank of Baroda (BOB)	HDFC Bank (HDFC)
Canara Bank (CAN)	ICICI Bank (ICICI)
Union Bank (UNION)	Kotak Mahindra Bank (KMB)

- **Variables used for the study:**

1. Dependent variables (Profitability Ratios)

a) Return on Equity/Net worth (ROE)
b) Return on Assets (ROA)
c) Net Profit Margin (NPM)

2. Independent variables

a) Total number (volume) of financial transactions done by the debit card issued by the bank (PoS terminals).
b) Total number (volume) of cash withdrawal transactions done by the debit card issued by the bank (ATM).
c) Total number (volume) of transactions done through mobile banking.

DATA ANALYSIS

Profitability analysis of selected Indian banks.

The following tables 2,3 and 4 show the profitability ratios such as Net Profit Margin, Return on Assets and Return on Equity respectively. With a mean value of 28.348, Kotak Mahindra Bank has the highest Net Profit Margin, followed by HDFC Bank which has a mean value of 25.67. With a Net Profit Ratio of

5.65, Union Bank of India has the lowest ratio. Table 3 reveals that Kotak Mahindra Bank has the highest Return on Assets with 1.994 as the mean value followed by HDFC Bank with 1.746. Table 4 shows that, with a mean value of 15.128, HDFC Bank has the highest Return on Equity/Net Worth, followed by ICICI Bank with 13.084. Kotak Mahindra Bank and State Bank of India have their ROA at 12.514 and 12.47 respectively. Union Bank of India records the lowest ratios in terms of both Return on Assets and Return on Equity.

Table 2: Net Profit Ratio (%) of selected Indian banks.

NET PROFIT MARGIN								
	Public Sector Banks				Private Sector Banks			
	SBI	BOB	CAN	UNION	AXIS	HDFC	ICICI	KMB
2019-20	5.63	0.71	-4.56	-7.78	2.59	22.86	10.6	22.08
2020-21	7.69	1.17	3.69	4.22	10.35	25.74	20.46	25.94
2021-22	11.49	10.4	8.18	7.7	19.33	28.93	27.02	31.7
2022-23	15.12	15.74	12.56	10.44	11.24	27.29	29.2	31.93
2023-24	14.71	15.79	13.39	13.67	22.73	23.53	28.61	30.09
Mean	**10.928**	**8.762**	**6.652**	**5.65**	**13.248**	**25.67**	**23.178**	**28.348**

Source: Money control

Table 3: Return on Assets (%) of selected Indian banks.

RETURN ON ASSETS								
	Public Sector Banks				Private Sector Banks			
	SBI	BOB	CAN	UNION	AXIS	HDFC	ICICI	KMB
2019-20	0.36	0.04	-0.3	-0.52	0.17	1.71	0.72	1.65
2020-21	0.45	0.07	0.22	0.27	0.66	1.78	1.31	1.81
2021-22	0.63	0.56	0.46	0.44	1.1	1.78	1.65	1.99
2022-23	0.91	0.96	0.78	0.65	0.72	1.78	2.01	2.23
2023-24	0.98	1.12	0.97	0.98	1.68	1.68	2.18	2.29
Mean	**0.666**	**0.55**	**0.426**	**0.364**	**0.866**	**1.746**	**1.574**	**1.994**

Source: Money Control

Table 4: Return on Equity (%) of selected Indian banks.

Return on Equity/Net worth								
	Public Sector Banks				Private Sector Banks			
	SBI	BOB	CAN	UNION	AXIS	HDFC	ICICI	KMB
2019-20	6.95	0.76	-6.78	-9.46	1.91	15.35	6.99	12.25
2020-21	8.86	1.07	5.05	4.87	6.48	15.27	11.21	11.01
2021-22	12.33	8.46	9.85	7.94	11.3	15.39	13.94	11.9
2022-23	16.75	14.36	16.03	11.68	7.63	15.74	16.13	13.17
2023-24	17.46	15.85	18.69	14.94	16.45	13.89	17.15	14.24
Mean	**12.47**	**8.1**	**8.568**	**5.994**	**8.754**	**15.128**	**13.084**	**12.514**

Source: Money Control

Results of Correlation Analysis

Table 5: Pearson's Correlation Matrix for selected variables

	NPM	*ROA*	*ROE*	*ATM*	*POS*	*MB*
NPM	1.000**					
ROA	.999**	1.000**				
ROE	.833*	.813*	1.000**			
ATM	-0.2668	-0.2950	0.2016	1.000**		
POS	-0.0492	-0.0838	0.4415	.954**	1.000**	
MB	-0.1631	-0.1949	0.2984	.985**	.978**	1.000**

**Correlation is significant at 0.05 level (Two-tailed)*
*** Correlation is significant at 0.01 level (Two-tailed)*
Source: Computed data

It is possible to interpret from the given data that

- There is a positive correlation between Return on Equity and the volume of transactions done through ATMs (0.202), PoS (0.442) and Mobile Banking (0.298). There is no significant relationship between Return on Equity and the volume of transactions done through ATMs, PoS and Mobile Banking.
- There is a negative correlation between Net Profit Margin and the volume of transactions made through ATMs (-0.267), PoS (-0.0492) and Mobile Banking (-0.16311). Hence, there is no significant relationship between Net Profit Margin and the volume of transactions done through ATMs, PoS and Mobile Banking.
- There is a negative correlation between Return on Equity and the volume of transactions done through ATMs (-0.295), PoS (-0.0838) and Mobile Banking (-0.195). Hence, there is no significant relationship between Return on Equity and the volume of transactions done through ATMs, PoS and Mobile Banking.

Results of Multiple Regression Analysis

Table 6: Results of E-banking variables on NPM (Multiple Regression Analysis)

Regression Statistics					
Multiple R			0.74215344		
R Square			0.550791729		
Adjusted R Square			0.213885526		
Standard Error			8.027601906		
Observations			8		
ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	3	316.0613	105.3538	1.634851847	0.315792394
Residual	4	257.7696	64.44239		
Total	7	573.8309			
	Coefficients	*Standard Error*		*t Stat*	*P-value*
Intercept	8.991193368	9.531816208		0.943282	0.39894675

ATM	-6.99688E-09	4.6911E-09	-1.49152	0.210093912
PoS	1.19198E-08	1.013E-08	1.176683	0.30456386
MB	3.7378E-10	1.23511E-09	0.302628	0.777257713

Source: Computed data

Equation

NPM = 8.991 + (-6.997×ATM) + (1.192×PoS) + (3.738×MB)

From the above table, it can be deduced that the R square value is 55%. This means that 55% of the variation in Net profit margin is explained by changes in selected e-banking variables.

P value 0.316, is greater than 0.05. This means that there is no significant impact of ATM, PoS, and Mobile banking transactions on Net Profit Margin.

It can be concluded that

- There exists a negative insignificant relationship between Net Profit Margin and volume of ATM transactions.
- There exists an insignificant positive relationship between Net Profit Margin and the volume of PoS transactions as well as the volume of transactions done through mobile banking.

There is no significant impact of the selected E-Banking variables (ATM, PoS and MB) on the NPM of the banks. As a result, H_{01} is accepted.

Table 7: Results of E-banking Variables on ROA (Multiple Regression Analysis)

Regression Statistics					
Multiple R			0.728821088		
R Square			0.531180178		
Adjusted R Square			0.179565311		
Standard Error			0.586580875		
Observations			8		
ANOVA					
	df	***SS***	***MS***	***F***	***Significance F***
Regression	3	1.559379008	0.519793	1.510687482	0.340619621
Residual	4	1.376308492	0.344077		
Total	7	2.9356875			
	Coefficients	***Standard Error***	***t Stat***	***P-value***	
Intercept	0.611137542	0.696494564	0.877448	0.429785144	
ATM	-4.86798E-10	3.42781E-10	-1.42014	0.22859125	
PoS	8.23595E-10	7.40207E-10	1.112655	0.328214089	
MB	2.52611E-11	9.02503E-11	0.279901	0.793431579	

Source: Computed data

Equation

ROA = 0.6111 + (-4.868×ATM) + (8.236×PoS) + (2.526×MB)

From the above table, it can be interpreted that the R square value is 53%. This means that 53% of the variation in Return on Assets is explained by changes in selected E-banking variables.

P value 0.341 is greater than 0.05. This means that there is not much impact of ATM, PoS, and Mobile banking transactions on Return on assets.

It can be concluded that

- There exists a negative insignificant relationship between Return on assets and volume of ATM transactions.
- There exists an insignificant positive relationship between Return on assets and volume of PoS transactions as well as the volume of transactions done using mobile banking.

There is no significant impact of the selected E-Banking variables (ATM, PoS, and MB) on the ROA of the banks. As a result, H_{02} is accepted.

Table 8: Results of E-banking Variables on ROE (Multiple Regression Analysis)

Regression Statistics					
Multiple R			0.85689549		
R Square			0.73426988		
Adjusted R Square			0.53497229		
Standard Error			2.138366299		
Observations			8		
ANOVA					
	df	***SS***	***MS***	***F***	***Significance F***
Regression	3	50.54045	16.84682	3.684289	0.120014335
Residual	4	18.29044	4.57261		
Total	7	68.83089			
	Coefficients	***Standard Error***		***t Stat***	***P-value***
Intercept	8.143154976	2.539053978		3.207161	0.032677
ATM	-1.80719E-09	1.2496E-08		-1.44622	0.221652
PoS	6.34797E-09	2.69841E-08		2.35249	0.078302
MB	-6.66725E-11	3.29005E-09		-0.20265	0.8493

Source: Computed data

Equation

ROE = 8.143 + (-1.807×ATM) + (6.3479×PoS) + (-6.667×MB)

From the above table, it can be interpreted that the R square value is 73%. This means that 73% of the variation in Return on Equity is explained by changes in selected e-banking variables.

P value 0.120 is greater than 0.05. This means that there is not much impact of ATM, PoS, and Mobile banking transactions on Return on Equity.

It can be concluded that

- There exists a negative insignificant relationship between Return on Equity and volume of ATM transactions.
- There exists a negative insignificant relationship between Return on Equity and volume of Mobile banking transactions.
- There exists an insignificant positive relationship between Return on Equity and volume of PoS transactions.

There is no significant impact of the selected E-Banking variables (ATM, PoS and MB) on the ROE of the banks. Therefore, H_{03} is accepted.

FINDINGS

- According to the study, the volume of transactions made through mobile banking has increased tremendously during the last 5 years in both public and private sector banks.
- In the year 2019-20, the volume of mobile banking transactions through public banks was 4,136,691,332 which increased to 55,307,356,581 by the year 2023-24. Similarly, private banks also showed an increase in mobile banking transactions from 4,027,465,069 in 2019-20 to 30,189,506,183 by 2023-24.
- The volume of transactions through ATMs has reduced from 4,641,224,837 in 2019-20 to 3,395,638,124 in 2023-24. The volume of transactions through PoS transactions has reduced from 1,953,456,344 in 2019-20 to 725,005,075 in 2023-24.
- There is a positive correlation between ROE and the independent variables. There is a negative correlation between ROA and the independent variables & Net Profit Margin and the independent variables.
- The results of the multiple regression analysis show that the E-banking variables have little to no impact on the bank's profitability ratios.

CONCLUSION

The study's conclusions indicate that while the volume of transactions made through ATMs and Points of Sale has been declining over the previous five years, the volume of transactions made through mobile banking has increased. People have avoided offline banking these years. Due to COVID-19, they mainly use mobile banking for payments. The pandemic has also decreased the rush hour traffic at ATMs and branch locations for cash withdrawals. Garg et al., (2021) took up "A Study on Impact of Covid-19 on Mobile Banking" and explained that "due to the pandemic and lockdown most people tried to learn mobile payment as it became a compulsory task during that period. Mobile banking like Google Pay, Phone Pe, Amazon Pay, BHIM UPI, etc. enhance the banking sector and transaction hindrance among people becomes easier". To increase profitability, the management should continue to work to keep costs and disbursement costs under control.

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