

## **IMPACT OF CASHLESS BANKING ON PROFITABILITY: A CASE STUDY OF BANKING INDUSTRY OF PAKISTAN**

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### **ABSTRACT**

Pakistani banking industry is at transforming stage, making investment in technology to upgrade its infrastructure for implementation of cashless banking in the country. This study examines the impact of cashless banking on profitability of Pakistani banking industry. To measure cashless banking in the country proxies of Automated Teller Machines Transactions (ATMT), Point of Sales Transactions (POST), Call Center Banking Transactions (CCT) and Mobile Banking Transactions (MOBT) are used to examine their impact on aggregate Return on Equity (ROE) of the banking industry. Ordinary Least Square (OLS) multiple regressions are used to obtain the results and data from 2<sup>nd</sup> quarter of 2007 to 4<sup>th</sup> quarter of 2014 is used. The results show that POST and MOBT are positively significantly related to ROE, CCT and ATMT are negatively significantly associated with profitability. Recommendations are made that banks should educate their customers to use of internet banking services, because it reduces time cost of both. Call center banking customer's confidence should be built so they can use this channel without any fear.

**Keywords:** Cashless Banking, Point of Sales, Call Center, Mobile Banking, Profitability

### **INTRODUCTION**

Banking system is the most prominent financial intermediation provider throughout the world. Combination of banking and information technology revolutionizes the world. With rapid increase in the use of internet and other creation of information and technology, a radical change is observed in the banking practices from conventional physical banking to branchless banking. As an agent it is foremost need of bank to have latest technology and highly developed services which increase trading, exports and improvise industry as a gift of globalization.

Mixture of banking and information technology is successful in attracting huge audience from bankers to business professionals, from law makers to academic researchers throughout the world. The basic reasons behind this attractions are abrupt changes in past few years is to cut costs, to save time, to increase revenue, to save resources and to provide one click 24/7 banking services to the customers due to information technology. It is because of development in the domain of technology that moves us into an era of cashless banking.

Globalization makes it compulsory for domestic banks to meet international banking standards. Pakistan's banking sector has gone through radical changes from its inception till present. Major changes take place after the introduction of foreign banks and information technology in Pakistan markets. Current situation in the country raised the concerns for customers as well as for banks. Carrying cash is very risky, so commercial banks intentionally provide cashless banking services under the umbrella of e-banking. In this way customer face less risk and convenience while bank also save time, cost, efforts with reduced security risk. Huge investment is made for stable and power full information technology which acts as backbone for efficient cashless banking services. State Bank of Pakistan issues strict policy guideline to resolves problem pertinent to cashless banking channels as major developmental steps in this domain. Quarterly reports developed by Payment System Department of State Bank of Pakistan as a regular check over the period of quarter.

According to the report of Payment System Department of State Bank of Pakistan 2015, there are 94.78% bank branches in Pakistan provides online banking services with 9597 number of ATM both on and off sites. Number of debit card users increased up to 25 million in 2014-15. There is 20% increase in the POS machines in comparison to 2013-14. E-banking transactions show growth of 100% in last 5 years. Figure 1 and 2 shows the graphical display of increasingly usage of cashless banking channels in Pakistan by customers.

Figure 1

Number of Transaction (In Thousands)

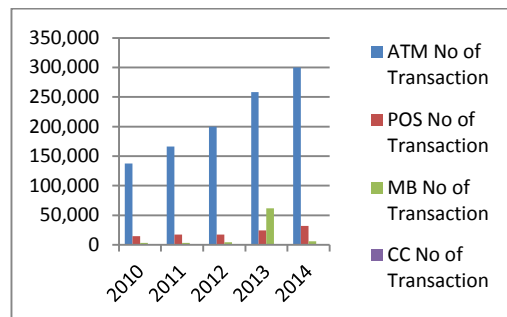
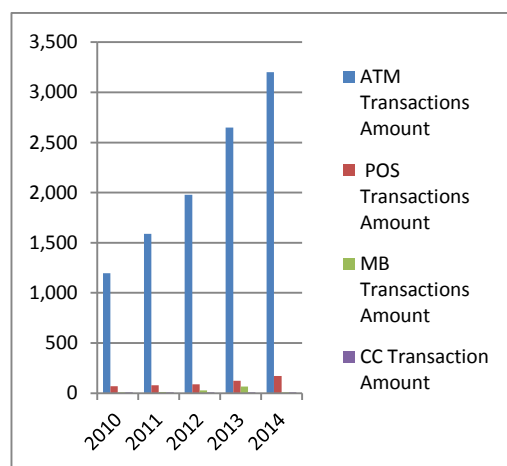


FIGURE 2

Amount of Transactions (In Millions)



The basic purpose of this study is to find the impact of cashless banking services on profitability of the banking sector in Pakistan. These services include call center banking, automated teller machine transactions, point of sale transaction, internet banking and mobile banking. According to best of my knowledge all these components of cashless banking is not collectively studied together.

This paper is divided into five sections. In section two detailed literature review is provided. Third section is about research methodology. It explains model specification and variables of the study.

Fourth section deals with analysis and result while last section is about conclusion.

## LITERATURE REVIEW

Cash less banking is defined as act of financial and banking transactions without using bills, coins or cash. The mode of transaction involves credit card, ATM card, telephonic and electronic transfer of fund, internet and mobile banking.

In today's digital world, technological changes are taking place quickly. These changes act as stimulus for banks to move towards cashless banking foundations. Various studies conducted to examine the impact of e-banking, internet banking or mobile banking on banks profitability. Banks which early introduce Automated Teller Machines (ATMs) have more market share than competitors, which give them competitive advantage specifically through cost reduction. ATMs increases bank's income for longer period (Dos Santos & Peffers, 1995). Simpson (2002) evaluated the impact of internet banking on bank profitability in USA and 40 other developing countries banking organizations. Analysis confirms that operational efficiency is achieved through internet banking by increasing revenue and decreasing cost. Due to strong information technology framework in USA the revenue generation is more than emerging economies banking sector.

Holden and El-Bannany (2004) checked profitability of UK banking industry due to introduction of modern e-banking equipment along with traditional measures like bank size, market share etc. Results confirm that ATMs significantly increase profitability of UK banking industry. Hernando and Nieto (2007)

performed study on Spanish banks to check the fruitfulness of investment in information technology framework. The analysis confirms that internet base transactions improved bank profitability. However it is time taking process with long run huge benefits. DeYoung, Lang, and Nolle (2007) evaluated the impact of banking through internet sources only on 424 US community banks. Massive increase in revenue observes during study time in deposit service charges head. A change in loan proportional mix is highlight of study. In comparison with traditional banking practices, internet banking increase flow of deposits to money market investments. Onay, Ozsoz, and Helvacioğlu (2008) studied Turkish banks profitability because of internet banking operations. Banks are divided into commercial and saving banks. Results support the previous literature by showing positive impact of internet banking services on banks profitability. This study also confirm the claim of Hernando and Nieto (2007) that internet banking services have impact on profitability of banks after three years. Possible reason behind this delay is people resist in adopting those activities which involve flow of funds. It results in high cost of investment for banks in first three years which reduce the profitability. Malhotra and Singh (2009) confirmed that internet banking have no significant impact on the profitability of the Indian banks, but internet banking have negative impact on risk profile of the banks.

Alber (2010) evaluated the profitability efficiency of Saudi banks by mix of traditional and e-banking factors. Results confirm that ATMs, number of branches and phone banking improved the banks efficiency; however POS and mobile

banking has no effect on efficiency. “Automation of banking services such as Internet banking , ATM banking, Telephone Banking or Mobile banking enables bank customers to access accounts and general information on bank products and services through personal computers, mobile phones or other intelligent devices” (Uchida, Ahmed, and Ahmed, 2011). Aduda and Kingoo (2012) evaluated e-banking impact on financial performance of commercial banks of Kenya. Number of ATMs cards has positive and significant impact on banks profitability. Electronic banking expenditure show positive significant impact on profitability. Over the period of time these expenditure goes down with increasing revenue which increase the profitability. Itah and Emmanuel (2014) explored the impact of cashless banking on Nigerian banks. ATM and POS are positively associated while web based transactions are negatively associated bank’s profitability. This is due to the high cost charged by the banks on online deposit services and reluctance of the customers to use these services. Karimzadeh (2014) studied electronic banking effect on commercial bank profitability in Iran. Results confirm that number of terminal branches, ATMs, POSs, market concentration and bank size have positive effect on bank’s profitability. Increase in e-banking channels increases the bank services to the customers, which lead towards increase in deposit and ultimately bank’s profitability. Valahzaghari and Bilandi (2014) confirmed pin pad affected profitability of Iranian banking sector positively.

Rauf and Qiang (2014) explored that mobile banking effect the profitability of Pakistani banking industry positively

and significantly for both measure of performance i.e. Return on Equity and Return on Assets. Jegede (2014) proved that deployment of ATMs has averagely improved the banks performance in Nigeria. Internet adoption have impact on performance of banks in Vietnam, but this impact level is low and have 3 years lag after its adoption(Dinh, Le, & Le, 2015). Reason for this low impact is that small size of internet banking and few number of internet users. Nawafleh (2015) demographical characteristics are the obstacles in use of e-banking by the customers and banks capital have significant impact on their expansion. Amujiri and Onodugo (2015) when cashless policy fully implemented, it help in reduction in money laundering, check on terrorist financing, ensure in effectiveness of monetary policy, employment created in financial sector and leads towards growth in real sector of the economy.

Khrawish and Al-Sa’di (2011) results contradict with previous results as adaptation of e-banking in each category does not affect the bank’s profitability. They perform study on Jordanian banks in a different way by dividing them into three sections i.e. non internet services provider, recent adopter of internet services and early adopter of the internet service providers in the county. Al-Smadi and Al-Wabel (2011) negate the results of Khrawish and Al-Sa’di (2011). They confirm that electronic banking has significant negative affect on bank’s profitability of Jordanian banking industry due to high cost associated with electronic banking services.

It is evident from the previous literature that several studies conducted on this issue but very few in Pakistan. This study is different from other because it

incorporates all the cashless banking dimensions identified by Payment System Department of State Bank of Pakistan. Call center banking is not previously considered potential dimension of cashless banking to checks its outcome on profitability.

### RESEARCH METHODOLOGY

Two types of secondary data are collected for this study. Cashless banking data is collected from quarterly and annual reports of Payment System Department of State Bank of Pakistan. Return on Equity (ROE) is proxy for profitability, calculated from Financial Analysis reports of Financial Sector by State Bank of Pakistan. Data is collected from the 2<sup>nd</sup> quarter of 2007 to 4<sup>th</sup> quarter of 2014 totaling to 31 observations. In Pakistan, no complete data of all the cashless banking factors is available before 2007. Variables of the study comprises of ROE, Volume of ATM Transactions (ATMT), Volume of POSs Transactions (POST), Volume of Call Center Transactions (CCT) and Volume of Mobile Banking Transactions (MOBT).

Current study is different from the previous studies because Payment System Department of State Bank of Pakistan provides the whole banking industry data instead of bank specific data. While previous studies use individual bank data to make industry wide claims which are less reliable. The results of this study are more reliable for banking sector of Pakistan then formerly done.

Ordinary Least Square (OLS) multiple regression analysis explore the relationship ship between cashless banking and bank profitability. Similar model is use in the studies like Al-Smadi and Al-Wabel (2011), Itah and Emmanuel (2014), Rauf and Qiang (2014), Karimzadeh (2014),

Valahzaghard and Bilandi (2014) to examine the effect of cashless banking on banks in different countries of the world. Descriptive statistics, correlation matrix and diagnostic tests are also performed to validate the authenticity of results. STATA 12 software is used for analysis.

### Model Specification

$$ROE=f(ATMT, POST, CCT, MOBT) \text{ -----1}$$

Equation 1 explains the function that is main theme of this analysis. Equation 2 is the model use in this study to explore the functioning of equation 1. It incorporates ATMT, POST, CCT and MOBT as independent/ explanatory variables and ROE as dependent variables of the study. Logarithmic transformation is performing on all independent variables to normalize the data to get better and reliable estimates in comparison with ratio values of ROE. Literature review confirms that collectively all these determinants of cashless banking are not analyzed before in the world. Therefore, to find the impact of ATMT, POST, CCT and MOBT on Pakistani banks performance following model needs to be tested:

$$ROE = \alpha + \beta_1 \log ATMT + \beta_2 \log POST + \beta_3 \log CCT + \beta_4 \log MOBT + \mu \text{ ----2}$$

### ANALYSIS

#### Descriptive Statistic:

Table 1 present the descriptive statics of the variables: ROE, ATMT, POST, CCT and MOBT from 2007 to 2014. Mean value of ROE in Pakistani banking industry is 3.26% per quarter with range from 1.57 % to 4.77% lowest in 2<sup>nd</sup> quarter of 2009 & highest in the 3<sup>rd</sup> quarter 2007.

TABLE 1

### Descriptive Statistics

Variabl e	Obs	Mean	Std. Dev.	Min.	Max.
ROE	31	3.258	0.849	1.57	4.77
ATMT	31	38402.1	17838.0	1439	7221
			3	3	9
POST	31	4705.48	1144.17	3411	7676
		4	6		
CCT	31	197.677	37.524	157	278
MOBT	31	669.816	619.548	4	1887

All values are in Thousands except ROE

ATMT has mean value of 3,8402.10 transactions per quarter, with lowest number of transactions in 2<sup>nd</sup> quarter of 2007 and highest in the 4<sup>th</sup> quarter 2014 showing growth of 402%. Average value of POST is 4,705.484 transactions per quarter with lowest 3,411 in 1<sup>st</sup> quarter of 2011 and highest 7,676 in 4<sup>th</sup> quarter 2014. Mean value of CCT is 197.68 transactions per quarter with lowest, 157, in 2<sup>nd</sup> quarter of 2013 and highest, 278, in 2<sup>nd</sup> quarter of 2009. MOBT has mean value of 669.82 transactions per quarter with range from 4 to 1,887 lowest in 2<sup>nd</sup> quarter of 2007 and highest in 3<sup>rd</sup> quarter of 2014.

### Correlation

Correlation provides useful insight in the relationship/ association between the variables. Table 2 present the relationship between each studied variable.

TABLE 2  
Correlation Matrix

Variab le	ROE	ATM T	POS T	CCT	MOB T
ROE	1				
ATMT	0.457 6*	1			
POST	0.342 0	0.722 0	1		
CCT	- 0.522 3*	- 0.576 4*	- 0.198 7	1	

MOBT	0.537 9*	0.950 5	0.625 0	- 0.661 5*	1
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ATMT and MOBT have positive and significant relationship with ROE of banks. POST has positive but insignificant relationship with ROE. CCT is a newly tested variable and has negative but significant association with ROE of banks. Highest insignificant correlation has been found between ATMT and MOBT, whereas, the lowest insignificant correlation between ROE and POST.

### DISCUSSION

Regression results are presented in table 3 which shows the value of R<sup>2</sup> is 42.92 % which means that almost 43% of change in profitability of banking sector is explained through these cashless banking factors. 57 % of changes in profitability is due to untapped factors not incorporated in this model.

The value of the F Statics is significant at 5%, rejecting the null hypothesis and confirming that our estimated coffeicient values of independent varaibles are not zero. This indicates that cashless banking has significant impact on profitability of Pakistani banking industry.

TABLE 3  
Model Summary

Source	SS	df	MS			
Model	9.29327241	4	2.3233181	Number of obs =	31	
Residual	12.3576111	26	.475292736	F( 4, 26) =	4.82	
Total	21.6508835	30	.721696118	Prob > F =	0.0045	
				R-squared =	0.4292	
				Adj R-squared =	0.3414	
				Root MSE =	.68941	

ROE	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
LATMT	-2.752233	1.287668	-2.14	0.042	-5.399073	-1.1053931
LPOST	2.692845	1.081388	2.49	0.019	.4700214	4.915669
LCCT	-1.933221	.8970748	-2.16	0.041	-3.777185	-.0892576
LMOBT	.593391	.2710359	2.18	0.038	-.0342165	1.148461
_cons	16.32161	8.398324	1.94	0.063	-.9413904	33.58462

From the above table result shows that all the studied variables are significant at 5 %. LATMT and LCCT are negatively significant whereas the other two i.e. LPOST and LMOBT, positively significant.

LPOST has significant positive impact on profitability of banking industry. This indicates that 1 % increase in LPOST leads to 2.69% increase in profitability. It is most convenient and secure for customers to use POS. It increases customer's confidence as well as perception of the bank improves in customer's mind due to ease for user. This increase deposits in the banking sector which through efficient channelization increase profitability (Karimzadeh, 2014). LMOBT has positive and significant impact on banks profitability, which indicates that 1% increase in mobile banking transactions leads to 0.59% increase in banking profitability. Mobile banking provides ease to customer to do their transactions without visiting the branches. It also increases employee performance by reducing fatigue which also increases profitability. The result are confirming with Rauf and Qiang (2014).

LATMT has negative and significant relationship with profitability, which indicates that 1% increase in ATMT leads to 2.75% decrease in banks profitability. This is due to that ATMs

breakdown, cash shortage in ATMs, increasing rate of ATM frauds, ATM theft and waiting in long queue on certain days of the months. All the reasons reduced the sense of security and ease which ultimately reduce profitability. Similar results are shown by the studies of (Alber, 2010; Giordani & Floros, 2015). LCCT has negative and significant impact on profitability of banking industry. 1% increase in LCCT leads to 1.93% decrease in banks profitability. This variable has not been previously tested for banks profitability. This service mostly used by the customers for non-financial transaction rather than financial transaction that causes increased cost. Other possible reason for such results is due to long waiting on call that is not providing any sense for ease. One more prominent reason is lack of trust to disclose any information dealing with monetary aspects with fear of leakage or misuse.

TABLE 4  
Variance Inflation Factors

Variable	VIF	1/VIF
LATMT	4.56	0.205
LMOBT	2.47	0.405
LPOST	3.47	0.288
LCCT	1.66	0.603
Mean VIF	3.14	3.14

Variance Inflation factor is used to quantify the severity of multicollinearity existence in multiple regression equation. It is desirable to have value equal to 1 while value less than 10 is acceptable. The results confirm no multicollinearity problem in model.

TABLE 5  
Normality Test

Variable	Obs	W	V	z	Prob. > z
u3	31	0.94	1.65	1.03	0.14
		9	0	8	9

Shapiro-Wilk W test for normal data

Probability value of above test is 14.97% which is more than 5%, so we will accept the null hypothesis that residuals are normally distributed. Breusch-Pagan test to diagnose the problem of Heteroscedasticity in this model. Probability value of the test is 22.08% which means we cannot reject the null hypothesis. It means that residuals are Homoscedastic i.e. variance is constant.

TABLE 6

Heteroscedasticity

Chi2 (1)	1.50
Prob. > Chi2	0.2208

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variables: Fitted values of ROE

It is also known as serial correlation; it is the similarity between observations as a function of the time lag between them. Durbin's Alternative test is used to check whether time series data is serially correlated or not.

TABLE 7

Autocorrelation

Lags(p)	chi2	df	Prob. chi2
1	5.517	1	0.1880

Durbin's alternative test for autocorrelation

Ho: no serial correlation

Probability value of the test is 18.80%, which is more than 5% so we cannot reject the null hypothesis which confirms no serial correlation.

## CONCLUSIONS

Huge investments made by this sector on infrastructure to provide the banking services to its customers at their convenience at lowest possible cost. Cashless banking is considered a way towards the innovation in providing the banking services to its customers without carrying cash with them.

This paper investigate that what impact cashless banking has on profitability of Pakistani banking industry through ATMT, POST, CCT and MOBT during the period 2007 to 2014. Call center transaction is the new variable which is first time consider for analysis. The result shows that POST and MOBT have positive and significant impact, which indicates that increase in these services leads to increase in profitability of banks. However CCTa newly tested variable affect the bank's profitability negatively. This is due to 19 out of 35 banks are offering call center banking services to its customers. This service mostly used by the customers for non-financial transaction rather than financial transaction that causes increased cost. The major reason for not using this service is lack of trust by customer on this channel due to the fear of leakage of their personal information. ATMs have negative and significant impact on profitability of



Pakistani banking industry. Several issues of ATM machines, either card are stuck in the machines or machines will not dispense cash due to server link down, which makes customers dissatisfied. State bank of Pakistan being the regulator needs to emphasize on commercial banks to educate their customers for use of cashless banking sources, this will ultimately help them in cost reduction due to less traffic in branches.

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