ELECTRONIC BANKING AND BANKING PERFORMANCE: AN EMPIRICAL STUDY OF PAKISTAN'S BANKS

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Abstract

The objective of the paper is to empirically investigate the impact of electronic banking proxies on banking performance. We use data for four different banks of Pakistan for the years 2005–2013. The methodology adopted in this paper is Fixed Effect Model. The findings of this paper are contrary to the conventional wisdom. The paper finds that all the proxies of e–banking have a negative significant impact on banking performance both in term of ROE and ROA. Moreover, our results show that number of ATMs have stronger significant negative impact on the performance of the banks in Pakistan. Banks intend to restrict their services which would help them to focus on bank profit or bank performance instead of market capturing.

Key Words: Banking performance, ATMs, Online cash deposits, online cash withdrawals, JEL Classification: G1, G21, M15

Introduction

A banking system being run via computerized technology and telecommunication links rather than conventional ways is known as Electronic banking. Karjaluoto *et al.* (2002) defines electronic banking as a construct which is associated with several distribution channels. Automated Teller Machines (ATMs), Credit Cards, Debit Cards and



online transactions all fall under the umbrella of electronic banking. In recent times, electronic banking has increased rapidly. For instance,

Figure 1: E- Banking Composition (volume of Transactions) Source: SBP

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423.5 million people use electronic banking as per a report conducted by Com Score Data Mine in 2012. United States, Europe and Asia pacific are at the top, accounting 80% of the total electronic banking. Aduda and Kingoo (2012) probed relationship between electronic banking and banking performance in Kenya. The proxies they used are: number of ATMs, investment in e-banking and number of debit cards issued to customers. Their results show that e-banking has a positive relationship with banking performance. Clouds of Electronic banking have provided comfort to many customers around the globe and indeed these clouds are penetrating into the banks of Pakistan.

State Bank of Pakistan has played a vital role in the growth of electronic banking as in 2002 Electronic Transaction Ordinance (ETO) was promoted by State Bank of Pakistan which officially identifies electronic settlement of transaction in banking industry. In Pakistan people are now well aware of electronic banking (Hassan et al 2011). The report of State Bank of Pakistan states that the amount of Electronic banking transactions has reached Rs 7.9 Trillion with a growth of 4.37 percentage during the third quarter of 2012–2013 and by the end of the fiscal year of 2013, two hundred seventeen more ATMs have been installed by various banks bringing total number of ATMs in the country to six thousand four hundred forty nine. Banks in Pakistan are expanding their online branches and offering more electronic services. According to the annual report of State Bank of Pakistan are offering electronic services to their customers.

However, there is another perceptive which states that the importance and advantages of electronic banking have been overemphasized by many researchers, as they ignore flip side of the picture. For instance to run the site, banks have to recruit specialist web developer for which banks have to bear a very high cost in terms of their salaries. The installation of capital such as expensive computers, ATMs etc decreases banking performance mainly due to the high installation cost that a bank has to bear during installation (see Giordani, 2012). It becomes difficult to sell products/services like insurance, loans etc online which is rather quite easy to sell and convince a customer while

interacting face to face. Another loss associated with electronic banking is the shutdown of a web site which stops customers to access their accounts. High investment is required to stay commensurate with upcoming of new ways in order to stay ahead of thieves and keep customers account secure. The probability of fraudulent activity is high in electronic banking so if any fraudulent activity occurs - ultimately the bank is responsible for the compensation of the damage which eventually may decrease bank performance or profit both in terms of ROA and ROE. "Gone in sixty" seconds was a very eminent fraud in which dollar one million was withdrawn online from the Citibank, another loophole of electronic services resulting in loss (see for instance, Itah and Emeka, 2014).

The present paper aims to empirically probe the impact of ebanking proxies on banking performance in Pakistan. This panel study covers four different banks of Pakistan for the years 2005–2013 namely Bank Al habib, Muslim Commercial Bank, Habib Bank and Allied bank. There are multiple reasons to study these banks. First rationale to study these banks is their presence in the KSE (Karachi Stock Exchange 100), Second is the access of e- banking data via personal sources which restricted us to study these banks, Third reason to take these banks into account is that they are in the list of top ten banks of Pakistan which are mostly preferred by the costumers in terms of their services (see Viewership research, 2014).

The contribution of the paper is to empirically examine the impact of four different proxies of electronic banking in aggregate i.e. (Number of ATMs, Number of Credit Cards, Online Cash withdrawal and Online Cash Deposits) on banking performance. As per our knowledge no other paper has attempted to do so. E–banking and banking performance has excessively scratched under the exploratory study; Therefore we were motivated to work empirically on this topic. The paper is based on instrumental theory of technology andaims to examine the impact of Electronic banking proxies on the performance of banks in Pakistan.

The rest of the paper is organized as follows. Section two describes theoretical background & literature review. Section three is devoted to the model and methodology whereas data sources are discussed in section four. In section five empirical analysis and findings of the results have been discussed. The last section covers the concluding remarks and policy recommendation.

Theoretical Background & Literature Review

Technological innovation influenced textile industry couple of centuries ago. We are now in the sixth wave of innovation and the current wave of technological innovation has helped in electronic age. This innovation in technology has not just altered our lives but also the banking industry. There are many theories like theory of reasoned action (TRA), theory of planned behavior (TPB) and technology acceptance model (TAP) which are used as theoretical background in electronic banking researches (see Ezzi, 2014 and Riyadh et al, 2009). Nevertheless these theories are tilted towards the adoption of technology by the consumers. For instance, what are the reasons that compel people to adopt new technology? So these sought of theories do not fall in our realm as our focus is to see how these electronic banking technologies are used to alter banking performance.

The paper is based on instrumental theory of technology. The theory was developed byAndrew Feenberg in 1991 (see Transforming Technology: A critical Theory revised, Oxford University Press). The theory presents broadly established vision of technology. It is based on the notion that technologies act as a "tool" to serve the purpose of the users and these act "neutrally" which means that technology can be transferred from one society to the other and its productivity can be measured objectively regardless of culture. The theory states that the positive or negative impact of technology is because of its handling by the firm/ industry/business not by the technology itself. Arnold Pacey (2001) argued that when technologies fail or give negative consequences, it is not the fault of the technologies but maltreatment by the industries, politicians and others. The theory further discusses trade-offs. For instance, to achieve environment, market capturing, ethnic goal there is a price and that price is in the form of reduced efficiency (see Meaning in Technology, MIT Press, 2001). As far as the relationship between technology and performance is concerned there are varieties of channels.

For instance, the empirical banking literature largely examines the long term distinction in average costs due to a given change in technology, known as technical change (Hunter and Timme, 1991). As Altunbas et al. (2001a) in general propose that technical change reduces bank costs and thus enhances performance.

The increasing popularity of electronic banking and banking performance around the globe has fascinated many researchers to put scrutiny on this domain. Chibueze, et al (2013) investigated pre and post adoption of electronic banking in Nigeria and find that electronic banking has positively and significantly ameliorated the Return on Equity but as far as the Return of Assets are concerned negative impact has been observed by electronic banking. Electronic banks are capital intensive and initially have to bear a high cost for the installation of electronic devices therefore electronic banking is a gradual process that needs some time to contribute positively to bank profitability in terms of ROA and ROE as the work of Simon et al (2013) found that electronic banking has a positive impact on return on asset after the time lag of two years (see Kariuki; 2005, Aduda and Kingoo; 2012, Javaid; 2012 and Ngango, et al 2015). The system of e-banking is considered to be an innovative service delivery mode which has introduced a number of financial services for instance online fund transfer, online bill payments, cash deposits, cash withdrawals and other financial enquires (Okechi and Kepeghom, 2013).

Despite the fact that according to many researchers electronic banking has ameliorated the banking system in term of revenue, speed, efficiency, time saving, ease of use, performance and many more; however according to some researchers electronic banking also has negative effects or it does not have an impact on banking performance at all. One of the pioneer researchers on e –banking Egland *et al.* (1998) focused on the US (United States) banks providing internet or e –services and their performance. They end up with no evidence which shows major difference in the performance of banks that are offering internet banking with the ones which are not offering e–services. Another work of (Sathye, 2005) shed light on e banking and banking performance in Austria. Her results showed that e banking is not a tool from which banking performance can by enhanced. Al-Smadi and Al-Wabel (2011) examined the impact of electronic banking on the performance of banks working in Jordan and they find a significant negative impact of electronic banking on banking performance. Their results show that electronic banking has not improved the performance in Jordan rather customers rely more on traditional banking system. They also argued that the cost of adoption of electronic banking is very high as compared to revenue generated from electronic services (see also, Khrawish and Al Sa'di 2011).

There was paradigm shift from the seller's market to buyer's market which compelled banks to shift from conventional to electronic banking and the best way is to adopt novel technology. The novel technology brought an environment of rivalry among the banks around the globe for that each bank wants to adopt the best electronic services that could solely be possible with the help of novel methods of technology. A body without brain and electronic banking without technology is incomplete. Advancement in information technology enables electronic banks to offer new products which are beneficial for both the costumers and banks reputation. Bank's working pattern has been changed overall by the revolution in information technology and the future of electronic banks seems to be more comfortable and innovative with respect to products and services, implementation of information technology also in rural areas makes it fully successful (Tawari and Kumar, 2012). Electronic banking provides a whole array of advantages in the form of less cost during accessing and utilizing the product and services of banks, comfort and timesaving in a sense that transactions can be made even without the physical presence in the bank's premises, speediness is another advantage of electronic banking because of the fact that multiple accounts can be checked on just one click, under electron banking manipulating of cash is easy and the level of accuracy increases as the work of Chavan (2013) probed the electronic banking benefits and finds that e-banking has numerous benefits which in the end simultaneously increases the satisfaction of the costumers in term of quality service and enables banks to gain edge from their competitors.

The distinction between ROE and ROA is that, Return on Equity captures how efficiently a firm/company uses the money of the

shareholders on the other hand return on assets tells us how effectively a firm/company uses its assets. According to Rose (2001) there is substantial variation between ROA and ROE. As Nikolai and Bazley (1997) the amount of net income earned in connection to aggregate resources is the sign that company uses its financial assets efficiently. They also emphasize that when return on equity is high as compared to return on Assets, the company has a positive financial power.

Electronic banking services have influenced many people around the globe in a positive manner. People now trust the electronic banking system in contrast to conventional or traditional banking services as Juwaheer *et al* (2012) highlighted that there is direct impact of simplicity and usefulness on the adoption of electronic banking. They also argued that trust and security also play a very indispensable role in the adoption of electronic banking, Muhammad and Smadi (2012), Daniel and Jonathan (2013) and Santouridis and Kyritsi (2014) supported the view point of Juwaheer *et al*, (2012). It is not only the matter of trust, security, simplicity and usefulness, other factors such as level of education, income of the households, age, gender and minimum risk factors also account for the adoption of electronic banking argued by these researchers (see also Munusamy et al, 2012; and Baddeley, 2004).

This paper differ from other studies because it has taken into account the four different proxies of electronic banking which shows maximum share in e–banking (see figure 1). In Pakistan most of the studies on this domain are exploratory studies and focus more on the adoption of e–banking by the consumers, lastly this issue has not been readily addressed empirically. Nevertheless this paper may try to fill the previous gap in the literature by empirically examining e- banking and banking performance in Pakistan.

The Models

The models take the following form ROEit= $\beta 0 + \beta 1$ NOAit + $\beta 3$ CAit + $\beta 4$ INFt + ϵit (1) ROEit= $\beta 0 + \beta 1$ NCCit+ $\beta 3$ CAit + $\beta 4$ INFt + ϵit (2) ROEit= $\beta 0 + \beta 1$ OCWit + $\beta 3$ CAit + $\beta 4$ INFt + ϵit (3) ROEit= $\beta 0 + \beta 1$ OCDit+ $\beta 3$ CAit + $\beta 4$ INFt + ϵit (4) ROAit= $\beta 0 + \beta 1$ NOAit + $\beta 2$ CAit + $\beta 3$ INFt + ϵit (5)

$ROAit = \beta 0 + \beta 1NCCit + \beta 2CAit + \beta 3INFt + \varepsilon it$	(6)
$ROAit = \beta 0 + \beta 1OCWit + \beta 2CAit + \beta 3INFt + \varepsilon it$	(7)
$ROAit = \beta 0 + \beta 1OCDit + \beta 2CAit + \beta 3INFt + \varepsilon it$	(8)
Where	

ROE is return on equity of bank i in year t; ROA is the return on assets of bank i in year t; NOA is number of automated teller machine of bank i in year t; NCC is number of credit cards of bank i in year t; OCW is online cash withdrawal of bank i in year t; OCD is online cash deposit of bank i in year t; CA is capital adequacy of bank i in year t; INF is Inflation in term of consumer price index; and random error of bank i in year t.

Banking performance is dependent variable in this paper and two proxies (return on asset, return on equity) are used separately to gauge banking performance. Return on Equity (ROE) and Return on Assets (ROA) are readily used as a gauge of bank performance in prior literature (See section 2). The independent variables in this paper are number of ATMs, number of credit cards, cash deposit, and cash withdrawal which are used as a proxy for electronic banking as this variable is the main focus of our paper. We have incorporated these surrogates because of the fact that a report by the State bank of Pakistan, 2013 (see figure 1) states that overall electronic banking transaction in terms of volume, Automated Teller Machine (ATMs) have the largest share of 63.70 percent whereas real time online banking (RTOB) that is cash withdrawal and cash deposits accounts for 22.6 percent in terms of volume.

In this paper two control variables (capital adequacy ratio and Inflation) have been used which can influence bank performance. For instance, Olalekan and Adeyinka (2013) empirically find a significant and positive relationship between capital adequacy ratio and bank performance however some studies suggest that that there is no significant impact of capital adequacy on profitability of private banks (Chishty, 2011). Inflation is another factor that can have positive or negative impact on banking performance and mix results have been found by the different authors in the banking industry (see for instance Umar, 2014).

Methodology

We will begin with the descriptive approach. The paper also uses correlation analysis to see the relationship between the variables. Then the paper uses panel cross sectional dependency test to check dependency among the residuals of an equation. Next, this panel study applies either Fix effect model or Random effect model depending on the results of Hausman (1978) test along with theoretical justification.

Cross section dependence is a problem that needs to be cured before undertaking the regression analysis; Otherwise it will lead to spurious results (Breusch and Pagan, 1980; Pesaran, 2004). If the time dimension is greater than dimension of cross section i.e. (T>N) then Breush and Pagan (1980) Cross Sectional Dependence Lagrange Multiplier (CDLM) Test is appropriate and if the time dimension is equal to dimension of cross section i.e. (T=N) then Pesaran (2004) CDLM2 is an appropriate test and lastly if the time dimension is less than cross section dimension i.e. (T<N) then Pesaran 2004 CDLM Test is appropriate. In our paper Breush and Pagan (1980) CDLM1 Test has been used because the time dimension is greater than number of cross section i.e. (T>N) (see Mehmet et al 2014).

The Equation of cross section dependence Test is as follows:

 $CDLM = \frac{\sqrt{2T}}{N(N-1)} \left[\sum_{N=1}^{N-1} \sum_{j=i+1}^{N} p^{ij} \right] N(0,1)....(9)$

Where

p^ij is the sample estimation of sum of cross section residualsH0: There is cross section independenceH1: There is cross section dependenceIf the probability value is greater than 0.05H0 is accepted and can be said that there is no cross section dependency.

The data

The paper uses annual data from 4 different banks of Pakistan. The sample period run from 2005 to 2013 making number of observation n= 36 which according to Central Limit Theorem is a large sample size because n>3. The study uses data from various annual reports of the studied banks, World Development Indicator and E–banking data was personally derived by visiting head/main offices of respective banks.

Empirical Results

Descriptive Statistics

The tables given below illustrate the results of empirical findings of those techniques discussed under the heading of methodology and all the analysis has been done by using Econometric package E-views version 8.

Table 5.1

	logsroa	logsolw	logsold	logsncc	logscapa	logsatm	sloginf	logsroe
Mean	1.77E-09	6.36E-09	5.23E-09	-5.13E-09	6.35E-09	3.50E-09	-1.46E-08	9.37E-09
Median	-0.267382	0.183060	0.066466	0.205309	0.146018	0.330193	-0.319011	-0.268798
Maximum	2.011608	1.536815	1.530555	1.496363	2.061217	1.230940	2.016468	2.211803
Minimum	-2.234024	-2.659648	-2.658756	-2.414711	-2.307134	-2.180763	-1.085366	-1.702057
Std. Dev.	1.000000	1.014185	1.014185	1.014185	1.028175	1.014185	1.014185	1.014185
Skewness	0.152550	-0.532531	-0.488306	-0.544633	-0.221444	-0.835473	0.639273	0.479476
Kurtosis	2.442294	2.720628	2.708902	2.431666	2.794557	2.416354	2.316201	2.307121
Jarque-Bera	0.606182	1.818610	1.557766	2.264258	0.357534	4.699059	3.153392	2.099506
Probability	0.738532	0.402804	0.458918	0.322346	0.836301	0.095414	0.206657	0.350024
Observations	36	36	36	36	36	36	36	36

Table 5.1 shows the descriptive statistics of all the variables utilized. As, the probability values of Jarque- Bera are more than 0.05 we will accept the null hypothesis (normal distribution) and therefore we can conclude that the residuals are normally distributed. The descriptive statistics also conclude that there is no outlier in our model as the minimum and maximum values have small variations

ROE Cross section Dependence Test Table 5.2

	Model 1	Model 2	Model 3	Model 4
Test	P value	P value	P value	P value
Breusch-Pagan Chi-square	0.0757	0.0736	0.0428	0.0415
Pearson LM Normal	0.6778	0.6607	0.3842	0.3709
Pearson CD Normal	0.1936	0.1695	0.1355	0.2904
Friedman Chi-square	0.7925	0.9500	0.9545	0.8386
Asymtotic critical values*	0.581080	0.581080	0.581080	0.581080
1%,5%,10%	0.382564	0.382564	0.382564	0.382564
	0.282785	0.282785	0.282785	0.282785

ROE Cross section Depend	dence Test	Table 5.3				
	Model 5	Model 6	Model 7	Model 8		
Test	P value	P value	P value	P value		
Breusch-Pagan Chi-square	0.3808	0.3396	0.1452	0.3743		
Pearson LM Normal	0.2975	0.3559	0.8951	0.3061		
Pearson CD Normal	0.2974	0.2895	0.3409	0.2782		
Friedman Chi-square	0.7287	0.7067	0.5730	0.7214		
Asymtotic critical values* 1%,5%,10%	0.581080	0.581080	0.581080	0.581080		
,,	0.382564	0.382564	0.382564	0.382564		
	0.282785	0.282785	0.282785	0.282785		

Table 5.2 and 5.3 show results of cross section dependence test for the four different models of ROE and ROA. The null hypothesis of all the test are, that there is no cross section dependence if the probability value is greater than 0.05. In our models for ROE and ROA, all the tests reject the alternative hypothesis and accept null hypothesis. On the other hand (Breusch- Pagan Chi- square) test shows that model 3 and 4 does not pass cross section independence test as their p-values are less than 0.05 but the model 3 and 4 passes the other three test of cross section dependence.

Corre	relation Matrix for ROE Table 5.4						
	slogroe	logsatm	logscapa	logncc	logsold	logsolw	logsinf
SLOGROE	1.000000						
LOGSATM	-0.352540	1.000000					
LOGSCAPA	0.023006	0.429540	1.000000				
LOGSNCC	-0.362671	0.541150	0.418164	1.000000			
LOGSOLD	-0.508417	0.768746	0.578571	0.320422	1.000000		
LOGSOLW	-0.398709	0.608187	0.590290	0.952196	0.229411	1.000000	
SLOGINF	-0.179943	0.029208	0.101516	0.147783	0.123442	0.163491	1.000000

Correlation Matrix for ROA

Table 5.5

							SLOGIN
	LOGSROA	LOGSATM	LOGSCAPA	LOGSNCC	LOGSOLD	LOGSOLW	F
LOGSROA	1.000000						
LOODKON	1.000000						
LOGSATM	0.308610	1.000000					
LOGSCAPA	0.522388	0.529540	1.000000				
LOGSNCC	-0.098020	0.541150	0.518164	1.000000			
LOGSOLD	0.046516	0.768746	0.578571	0.420422	1.000000		
LOGSOLW	0.046746	0.608187	0.590290	0.452196	0.329411	1.000000	
SLOGINF	-0.061983	0.029208	0.101516	0.147783	0.123442	0.163491	1.00000

Table 5.4 and 5.5 depict the results carried out from the Pearson Correlation analysis for the first four models in terms of ROE and last four models in terms of ROA. The results show that there is a moderate correlation between the variables both in terms of ROA and ROE.

Hausman Test for ROE	Table	5.6
Test Summary	Chi- Sq	P- Value
	Statistics	
Cross section random	10.52	0.01
Cross section random	19.82	0.00
Cross section random	7.48	0.04
Cross section random	8.30	0.04

Hausman Test for ROA Table 5.7

Test Summary	Chi- Sq Statistics	P- Value
Cross section random	10.49	0.00
Cross section random	18.32	0.00
Cross section random	5.99	0.04
Cross section random	6.83	0.03

Ho: Random effect model is appropriate Ha: Fixed effect model is appropriate

Results of table 5.6 and 5.7 are designed to see which model is appropriate for the regression analysis, either Fixed Effect Model or Random Effect Model. If the Probability value is less than 0.05 then the null hypothesis is rejected, which means that Random Effect Model is not appropriate for the regression. As our results of Hausman Test show that all the P-values are less than 0.05, which means that FEM is appropriate for the analysis. This is the econometric justification for selecting Fixed Effect Model. Economists usually focus on the impact and hence likely to use Fixed Effect Model (Todd and Wolpin, 2003) and some authors in any circumstances prefer Fixed Effect Model as Peto (1987) argued that the use of Random Effect Model is wrong because the question which is being answered by REM is difficult to understand and is uninteresting.

Fixed Effect Model is preferred over Random Effect Model if the two conditions are fulfilled. In this paper we assume that all the studied banks are functionally identical and share the common effect which fulfills our first condition, the goal of the analysis is to see e–banking and banking performance of banking industry not to extrapolate to other industries which fulfill our second condition to use Fixed Effect Model. So the decision to run Fixed Effect Model is not only based on Hausman test but from the literature as well.

Dependent variable: ROE Fixed Effect Results for ROE

Table 5.8

	Model 1			Model 2			Model 3			Model 4	
Variables	Coeffi	t-stat	Variables	coeffi	1-stat	Variables	Coeffi	t-stat	Variables	Coeffi	t-stat
LOGSATMS	-1.355	-13.5	LOGSNCC	-0.51	-3.6	LOGSOLW	-0.54	-3.6	LOGOLCD	-0.52	-3.8
LOGSCAPA	0.606	6.0	LOGSCAPA	0.62	4.8	LOGSCAPA	0.62	4.7	LOGSCAPA	0.55	4.2
LOGSINF	-0.202	-2.8	LOGSINF	-0.16	-2.2	LOGINF	-1.5	-2-2	LOSGINF	-0.17	-2.4
R-sq	0.67		R-sq	D.67		R-sq	0.68		R-sq	0.66	
D.W stats	2.02		D.W stats	1.88		D.W stats	1.93		D.W stats	1.83	

xed Eff	ect Re	sults	for ROA	L	Table 5.9						
Model 5			Model 6		1	Model 7			Model 8		
Variables	Coeffi	t-stat	Variables	coeffi	t-stat	Variables	Coeffi	i-slat	Variables	Coeffi	t-sta
OGSATMS	-0.75	-7.9	LOOSNCC	-0.28	3.3	LOGSOLW	-0.25	2.8	LOGOLCD	-0.28	-2.9
LOGSCAPA	0.29	2.9	LOGSCAPA	0.30	-0.4	LOGSCAPA	0.27	-0.4	LOGSCAPA	0.25	2.6
LOGSINF	-0.06	-0.6	LOGSINF	-0.05	-3.0	LOGINF	-0.04	-2.8	LOSGINF	-0.05	-0.9
R-sq	0.71		R-sq	0.71		R-sq	0.70		R-sq	0.70	
D.W stats	2.3		D.W stats	2.2		D.W stats	2.1		D.W stats	2.1	

Interpretation of Regression Results

Dependent variable: ROA

Table 5.8 depicts that number of ATMs have significant negative impact on banking performance in terms of Return on Equity. One percent change in number of ATMs will cause banking performance to decrease by 1.3 percent (see interpretation Gujarati 2003, 181-182). For negative impact of ATMs (see Ogbuji et al 2012 and Giordani 2012). Results of table 5.8 show number of credit cards, online cash withdrawal and online cash deposits have significant negative impact on return on equity. The results show that one percentage change in number of credit cards, online cash withdrawal and online cash deposits will decrease banking performance by 0.51, 0.54 and 0.52 percent respectively. The control variable capital adequacy is significant and has a positive impact on banking performance in terms of Return on Equity in all the models. Another control variable inflation shows significant and negative impact on banking performance in all the models of ROE. The positive and significant sign of capital adequacy indicates that Tier 1 capital is capable of protecting Pakistan's studied banks against financial losses. The other control variable inflation is insignificant and the negative sign reports that inflation causes banks to increase interest rates which force people to save instead of borrowing which may result in decline of the bank profit.

All the electronic banking proxies have also shown significant negative impact on banking performance in terms of return on assets. In table 5.9 Number of ATMs, numbers of credit cards, online cash withdrawal and online cash deposits have significant negative impact on return on assets. One percentage change in number of ATM, number of credit cards, online cash withdrawal and online cash deposits will decrease banking performance by 0.78, 0.28, 0.25 and 0.28 percent respectively. The control variable inflation is insignificant but enters in the model with negative sign and the other control variable capital adequacy entered the model with positive sign and is significant as expected.

The results of the above electronic banking proxies utilized are contrary to our expectations. All the proxies of electronic banking have significant negative impact on banking performance both in terms of return on equity and return on assets. The coefficient of number of ATMs (among other e-banking proxies) shows stronger significant negative impact on banking performance both in terms of return on assets and return on equity.

Al-Smadi, and Al-Wabel (2011), found that electronic banking has a significant negative impact on banking performance. They argued that the cost of adopting of electronic banking is higher than revenue generated from the electronic banking services. Malhotra and Singh (2009) argued that there is no significant association between adoption of internet banking or e-banking with banking performance and internet banking has a significant negative impact on bank profitability, the reason they gave is the higher cost of operations incorporating fixed cost and labor cost. For negative relationship (see also Khrawish and Al-Sa'di 2011; Karimzadeh and Alam 2012; Delgado, et al 2007). In our paper two possible justification of the negative impact of electronic banking proxies on banking performance in Pakistan can be given. First, the cost associated with electronic banking is very high as compared to the revenue generated via electronic channels, the cost of electronic infrastructure, maintenance cost, and employees training. Nevertheless, banks are still enhancing electronic services because of the fact that profit is not the sole objective of the banks; Banks are more focused on capturing the market and the customers. Second, banks are trading off in terms of market capturing and attraction of customers, so the opportunity cost of the banks are dwindling of the profit, both in terms of return on assets and return on equity which is also in line with the theory.

"For smaller firms managed by their owners, profit is likely to dominate almost all the firm's decisions. In larger firms, however, managers who make day-to-day decisions usually have little contact with the owners (i.e., the share holders). As a result, the owners of the firm cannot monitor the managers' behavior on a regular basis. Managers then have some leeway in how they run the firm and can deviate from profit-maximizing behavior to some extent. Managers may be more concerned with goals such as revenue maximization to achieve growth or the payment of dividends to satisfy shareholders than with profit maximization."(See R.S.. D.L.. Pindyck and Rubinfeld. "Microeconomics" third Edition).

Conclusion& Policy Recommendation

The paper empirically investigated the impact of electronic banking proxies on the performance of banks in Pakistan. Our sample includes 4 banks of Pakistan. The study used annual data for the years 2005–2013 making total number of observation 36. The study used fixed Effect Model. Return on equity and return on assets were used as a gauge of bank performance. The results of the paper revealed that all the proxies (i.e. number of credit cards, number of ATMs, online cash withdrawals and online cash deposit) of electronic banking have a significant negative impact on banking performance in Pakistan. The paper further shows that among all the proxies of e–banking, number of ATM has stronger significant negative impact on banking performance of the studied banks of Pakistan, as in line with the results of (Hassan *et al*, 2013) who also showed the stronger significant negative impact of ATMs among other e–banking proxies on banking performance both in terms of return on equity and return on assets.

This paper thus concludes that in general electronic banking is contributing negatively to the banking performance of Pakistan which may strengthen the existing literature on negative impact of e-banking and banking performance. We further discussed two justifications for the negative impact of e-banking. First, e-banking requires expensive capital, maintenance cost, and other cost associated with e-banking are very high as compared to the revenue generated from e-banking. Second, market capturing strategy has been followed by the banks of Pakistan instead of profit maximization because profit maximization is not the sole objective of a firm/bank so banks are more eager in building up a cashless society.

Banks are increasing their electronic services radically to facilitate their customers and the costumers are well cognizant of electronic banking but less in numbers. As Anne Folan (see The Express Tribune, October 20th, 2013), an independent consultant working with FINCA (Foundation for International Community Assistance) since 2000 said that 86% of adult population in Pakistan is unbanked. So the amount generated from fewer costumers results in negative impact on banking performance because of the fact that the cost associated with e–banking is very high and the amount generated from electronic banking is relatively low though banks are trying to capture the market but the policies they have adopted are slow which might lead Pakistan's banks to lag behind in the foreign competition. Following are some policy recommendations that might give benefit to banks in term of their performance and might increase bank population.

- As in Pakistan mobile banking has a very small share among electronic banking composition (see figure 1). So banks should give heed to the mobile banking as it would act as a beneficial bridge to covert unbanked population to bank population.
- Banks intend to restrict their services which would help them to focus on bank profit or bank performance instead of market capturing.

References

- Aduda, J., & Kingoo, N. (2012). The relationship between electronic banking and financial performance among commercial banks in Kenya, *Journal of finance* and investment analysis, 1(3): 99–118.
- Al-Smadi, M. O., & Al-Wabel, S. A. (2011). The impact of E–banking on the performance of Jordanian banks, *Journal of internet banking and commerce*, 16(2): 02–10.
- Altunbas, Y., Gardener, E.P.M., Molyneux, P., & Moore, B. (2001a) Efficiency in European banking, European Economic Review 45, 1931–1955
- Baddeley, M. (2004). Using e-cash in the new economy: an economic analysis of micropayment systems, UK Cambridge, *Journal of electronic commerce research*, 5(4): 239–253.
- Breusch, T.S., & Pagan, A.R. (1980). The Lagrange multiplier test and its applications to model specification tests in econometrics, *Review of economic studies*, 47 (1): 239–53.
- Chavan, J. (2013). Internet banking benefit and challenges in an emerging economy, International journal of research in business, 1(1): 19–26.

- Chibueze, A.Z., Maxwell, O. O., & Osondu, N. M. (2013). Electronic banking and bank performance in Nigeria, *West African journal of industrial and academic research* 6(1): 171–187.
- Chishty, K.A. (2011). The impact of asset quality on profitability of private banks in India (A Case Study of J&K, ICICI, HDFC, & Yes Bank), International journal of research in commerce & management, 2(7): 126–146.
- Daniel, P., & Jonathan, P. (2013). Factors affection the adoption of online banking in Ghana: Implications for Bank Managers, *International journal of business and* social research, 3(6): 94–108.
- Delgado, J., Hernando, I., & Nieto, M.J. (2007). Do European primarily Internet banks show scale and experience efficiencies? *European financial management*, 13(4): 643–671. doi: 10.1111/j.1468-036x.2007.00377.x.
- Egland, K. L., Furst, K., Nolle, D.E., & Robertson, D. (1998). Banking over the Internet, *Quarterly journal of office of comptroller of the currency*, 17(4): 25–30
- Ezzi S.W. (2014). A Theoretical Model of Internet Banking: Beyond Perceived Usefulness and Ease of Use, *Archives of business research*, 2(2).
- Giordani, G. (2012). Essays on the Econometric Analysis of Electronic Banking in Greece, *A PhD Thesis*, University of Portsmouth.
- Gujarati, D.N. (2003). Basic Econometrics, New York: McGraw Hill Book Co.
- Hassan, S.U., Mamman, A., & Farouk, M.A. (2013). Electronic banking products and performance of Nigerian listed deposit money banks, *American journal of computer technology and application*, 1(3):138–148.
- Hassan, Y., Yahya, F., Amin, M., & Arshad U.F. (2011). Awareness of electronic banking in Pakistan, *Global journal of computer science and technology*, 11(17): 13–21.
- Hausman, J.A. (1978). Specification test in econometrics, *Econometrica journal of the* econometric Society, 46(6): pp 12511–271.
- Hunter, W.C., & Timme, S.G. (1991) Technological Change in Large U.S. Commercial Banks, Journal of Business, 64, 339–362.
- Itah, A.J., & Emeka, E.E. (2014). Impact of Cashless banking on banks' profitability (evidence from Nigeria, Asian journal of finance & accounting, 6(2): 301. doi: 10.5296/ajfa.v6i2.6268.
- Javaid, H. (2012). Internet banking Vs commercial banking in terms of profitability index: Case study of Saudi Arabia, Eastern Mediterranean University, Master Thesis.
- Juwaheer, T. D., Pudaruth, S., & Ramdin, P. (2012). Factors influencing the adoption of internet banking: A case study of commercial banks in Mauritius, World journal of science, Technology and sustainable development,9(3): 204–234.
- Khrawish, H. A. & Al-Sa'di, N.M. (2011). The Impact of e-banking on bank profitability: evidence from Jordan, *Middle East finance and economics*, 1(13): 143–158.
- Karimzadeh, M., Alam, D. (2012). Electronic banking challenges in India: An empirical investigation, *Interdisciplinary journal of contemporary research in business*, 4(2): 31 – 45.
- Karjaluoto, H., Mattila, M., Pento, T., (2002). Factors underlying attitude formation towards online banking in Finland, *International journal of bank marketing*, 20(6): 261–72.
- Malhotra, P., & Singh, B. (2009). The impact of internet banking on bank performance and risk: an Indian experience, *Eurasian Journal of business and economics*, 2(4): 43–66.
- Mehmet, S., Yusaf, A., & Gokeen, O. (2014). Cross sectional dependence and cointegration analysis among the GDP-Foreign direct investment and aggregate credits: evidence from selected developing countries, *Asian economic and financial review*, 4(11): 14851–501.

- Muhammad, O., Smadi, A. (2012). Factors affecting adoption of electronic banking: An analysis of the perspectives of banks' customers, *International journal of business and social science*, 3(17): 2943–09.
- Munusamy, J., Run, E.C., Chelliah, S., Annamalah, S. (2012). Adoption of retail internet banking: a study of demographic factors, *Journal of internet banking and commerce*, 17(3): 02–14.
- Ngango, A., Mbabazize, M., Shukla, J. (2015). E-banking and performance of commercial banks in Rawanda: a case of bank of Kigali, *European journal of* accounting auditing and finance research, 3(4): 25–57.
- Nikolai L.,& Bazley J.D. (1997). Intermediate accounting, *South-Western college publishing*, Ohio.
- Nsouli, S.M., & Fullenkamp, C. (2004). Six puzzles in electronic money and banking, *IMF working papers*, 04(19): p 1. doi: 10.5089/9781451843774.001.
- Ogbuji, C.N., Onuoha, C.B., Izogo, E.E. (2012). Analysis of the negative effects of the automated teller machine (ATM) as a channel for delivering banking services in Nigeria, *International journal of business and management*, 7(7). doi: 10.5539/ijbm.v7n7p180.
- Okechi, O., Kepeghom, O.M. (2013). Empirical evaluation of customers' use of electronic banking systems in Nigeria, *African journal of computing and ICT*, 6(1): 07–20.
- Olalekan, A., Adeyinka, S. (2013). Capital adequacy and bank Profitability: empirical evidence from Nigeria, *American international journal of contemporary research*, 3(10): 87–93.
- Oyewole, O.S., Abba, M. Maude, E., Gambo, J., Arikpo, Abam, I. (2013). E-banking and banking performance: evidence from Nigeria, *International journal of scientific engineering and technology*, 2(8):766–771.
- Padachi, K. (2006). Trend in working capital management and its Impact on firm's performance: An analysis of Mauritian small manufacturing firms, *International review of business research papers*, 2(2):45–58.
- Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels, *Cambridge working papers in economics*, 435.
- Peto, R. (1987). Why do we need systematic overviews of randomized trials? (transcript of an oral presentation, modified by the editors)', *Statistics in medicine*, 6(3): 233–240. doi: 10.1002/sim.4780060306.
- Rauf, S. (2013). Electronic Banking as Competitive Edge for Commercial Banks of Pakistan: ROE Model, A research journal of commerce, Economics and Social Sciences, 7(1), 01-08.
- Riyadh N., Aker, S., & Islam, N. (2009) The Adoption of Electronic banking in Developing Countries: A Theoretical Model for SMEs, *International Review of Business Research Papers*, 5(6), 212 -230
- Rose, P.S. (2001). Commercial Bank Management', 4th Edition, Irwin/McGraw-Hill, Singapore
- Santouridis, I., & Kyritsi, M. (2014). Investigating the determinants of Internet banking adoption in Greece, *Procedia economics and finance*, 9: 501–510 doi: 10.1016/s2212-5671(14)00051-3.
- Sathye, M. (2005). The impact of internet banking on performance and risk profile: Evidence from Australian credit unions, Journal of Banking Regulation, 6(2), 163–174.
- Tiwari, R., & Kumar, R. (2012). Information technology in banking sector, *AsiaPacific journal of marketing and management review*: 1(1), 25–33.
- Todd, P.E., & Wolpin.K.I. (2003). On the specification and estimation of the production function for cognitive achievement, *Economic journal*: 113(485), 3–33
- Umar, M. (2014). Conceptual exposition of the effect of inflation on bank performance, Journal of world economic research, 3(5): 55. doi: 10.11648/ j. jwer. 20140305.11.