Global Journal of Management, Social Sciences and Humanities 135
Vol 8 (1) Jan-March, 2022 pp.135-168.. ISSN 2520-7113 (Print), ISSN 2520-7121 (Online)
www.gjmsweb.com Email:editor@gjmsweb.com. **Impact Factor = 2.187 (Google Scholar)**
DOI: 10.6084/m9.figshare.17942636 /GJMSSH/8/1/2022/5

Research Article **Open Access**

IMPACT OF FINANCIAL INNOVATIONS ON THE PERFORMANCE OF BANKS IN PAKISTAN

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Abstract

The objective of this research paper is to analyze the impact of financial innovations on the performance of Banks in Pakistan. For this purpose, we used time series data for the period from 2013 to 2019. The performance of bank was taken as a dependent variable while number of ATMs, number of credit card users, number of debit card users and internet banking were taken as independent variables. Econometric techniques such as descriptive statistics, correlation analysis and ARDL Model were applied to analyze the data. The results of the study show that number of ATMs, number of credit card users, number of debit card users, and internet banking have positive and significant relationship with banking performance in Pakistan. It is concluded that financial innovations play a vital role in improving financial performance of banking sector. We suggest that policy makers should devise policies which ensure maximum use of internet banking in order to reduce the costs of banks and boost their profitability.

Keywords: Financial innovations; ATM Cards; Efficiency; Internet Banking; profitability; Performance of banks

Article History: Received: Aug 22, 2021, Accepted: Nov 28, 2021. Online published: Jan 01, 2022.

1.Introduction

1.1. Background of study

Financial innovation means the inclusion of new financial products in financial institutions and markets by opting new technologies. The innovation is new approach of working enterprise, and implementing new technology, along with the automated Teller device (ATM), mobile banking and on line banking, etc. A financial innovation can also be called a product which is produced by service firms such as banks to satisfy its customers. The main motive behind financial innovation is profit and wealth maximization. As a result, the innovation should increase the revenue, (or if it is a process innovation, decrease the cost of production) sufficiently for it to be introduced. Last few years, these financial innovations have international acceptance and provided, as new economic instruments, tactics, services, institutions, and marketplace segments and so on. The impact of every innovation can be specific, depending on its role in the financial sector. The Government of Pakistan has taken a number of initiatives during 1979-1992 to introduce interest free products in the banking sector. In 1979, National Investment Trust, Investment Corporation of Pakistan and House Building Finance Corporation (HBFC) started lending interest free loans. In 1980s many Mudarba companies launched under Islamic principles of finance. Similarly, Participatory Term Certificates (PTCs) were introduced and Zakat ordinance was enforced. The situations confronted through this marketplace. Through the green use of numerous state-of-the-art banking technology, as well as applications of statistics and Information technology (IT) in banking sector, have not only improved, customer services but also enhance the profitability of the banks. The goodwill and performance of a financial institution, is

measured with the aid of numerous financial ratios such as ROE and ROA. In the era of globalization, technological advancement and operational management are the key factors that drive enhance efficiency in banking services.

The banking sector within the growing economy is bolstered by financial innovations that have widen the scope of the services of banking. The most effective drivers of banking services include automated teller machines, cellular banking and digital banking. The new features of the banking are very different from the features commonly found in other sectors. Financial expertise incorporates developments that enable optimal cash distribution and operating procedures that reduce transaction costs, either in major markets where equity arises appear or in the secondary market where such products are sold. Islamic Banking is a new emerging phenomenon in Pakistan and is based on the principles of Islamic (Shari'ah). Islamic banks ae also introducing innovative products, creating stiff completion and challenges. The number of Islamic banking have exceeded 1500 within short span of time and now many conventional banks are also converting their branches into Islamic banking. Now conventional and Islamic banking are operating side by side and competing with each other by introducing innovative products and services. Mobile banking is one of the financial services which involves online payment through mobile phone. This services helps the customers to carry out online transactions during the period of COVID-19 lockdown.

1.2 Main Research problem

The main research problem of this study is to analyze the impact of financial innovations in banking sector on the performance of banks in Pakistan.

1.3 Objective of Study

The objectives of this research paper are outlined in the following: -

- To assess how the financial innovations affects profitability of the commercial banks in Pakistan.
- To measure the impact, of financial innovations on income of the commercial banks in Pakistan.
- To compare the performance of Islamic and conventional commercial banks in introducing and adopting financial innovations in Pakistan.
- To analyze relationship between financial innovation and banking sector performance in Pakistan.

1.3. Scope of study

This study is related to the financial innovations which are being taken place in banking sector all over the world and banking sector is opting new innovations to enhance its efficiency and profitability. The results of this study will definitely be beneficial for financial managers, financial analysts and banks managers to realize the importance of financial innovations and bring change in their orthodox traditional ways of banking. Now banks can enhance their profitability through efficiency and developing human capital through training and development. This study will likely prove a great contribution in the literature of banking and finance. The new researchers will also get benefit from the results of this study and expand it further by including study period, using primary data and increasing the number of independent variables. This study contributes in the literature in a way of proving a guideline for bankers how to survive in competitive environment and how to beat competitors and how to attain sustainable growth in profitability and efficiency.

2. Analysis of relevant studies

A large number of scholars have studied on financial innovation in banking sector impact on its performance in Pakistan as Humayoun & Ahmad (2010) looked into historical background of Pakistani banking sector since its independence on August 14, 1947 from British rule. These studies reflect an image of Pakistani banking sector since its inception. It enables the readers, academician and bankers to have a look about banking developments in Pakistan. Akhtar et.al, (2011) measured the efficiency and performance, of Islamic bank, compare to public and private sectors. The data shows that the result of interest frees banking efficiency and performance. The analysis there is no different between balance sheet and income statement of Islamic bank in Pakistan. The study suggests for existing Islamic bankers to increase their performance. Shahid and Abbas (2012) measuring the financial permanence of Islamic banking in Pakistan. Islamic banks will in general be monetarily more grounded than huge Islamic banks, which may reproduce difficulties of credit hazard the board in huge Islamic banks. The piece of the overall industry of Islamic banks significantly affected the monetary strength of different banks. Malak and Makur (2013) measured the effect of financial innovation performance in banking sector. Used advance technology South Sudan's financial system transformations from foreign commercial banks. January 2009-December 2013 South Sudan registers sixteen banks with central banks. ROA recorded mean of 3.2534 standard deviation of 1.2548. Daily using ATM average transaction of commercial banks156, 547 standard deviations 20, 51. Financial innovation achieves the strong results of South Sudan commercial banks. Malik (2013) stated that creativity has vital impact on organizational performance. The study shows that relationship with supervisor to indicate

positive result on organization innovation and performance. The article shows that supervisor complexity with employee to effect the creativity and variable unaffected. Positive relationship between employee and organization increase innovation capability. In future research conducted managerial implication and recommendation. Mirpuri and Nigari (2014) explored the impact of financial innovation that convert of the traditional banking into a better customer service and global challenges. Kenyan bank; determine the financial innovation of commercial banks in Kenya mobile banking, online banking, agency banking. Forty-four commercial banks operate in Kenya; the target is that at least sixteen banks have at least four consecutive member management teams; local bank, state-owned banks have certain shares. Make & Lodhi (2014) examined the impact of corporate governance on intellectual capital efficiency and financial performance. The evidence of the study shows that an organization with new administrative procedures and IT application may enhance value creation and profitability.

2.1 Distinction of this Study

Financial Innovation focus on performance of Banking sectors and bank keep on designing new ways of financial intermediation to retain their existing clients and to attract new potential customers. This study is different from the above quoted studies in terms of period of study, variables and methodology. This study also carries out evaluation of Islamic and conventional banks operating in Pakistan for adopting financial innovations, to enhance their profitability and efficiency. It has made our research work distinct from previous studies.

3. Research Methodology

3.1 Type of data

The data used in this study is taken from annual reports of banks for the period of 2013-2019. The other source of data are data bases of Pakistan Stock Exchange, Pakistan Economic Survey and State Bank of Pakistan.

3.2 Sample of study

The banking companies included into the sample are: Habib bank limited, Allied Bank limited, United bank limited, Bank Al Habib, Bank Alflah Limited, Faisal Bank Limited, Meezan Bank Limited, MCB Bank Limited, and Islamic Bank of Pakistan, National Bank of Pakistan, The Bank of Punjab Limited, Habib Metropolitan Bank Limited, Askari Bank Limited.

3.3 Selected Variables.

The selected variables of this study are stated as under: -

3.3.1 Dependent variables

Financial Performance of banks is taken as dependent variables. The banking performance is measured through Return on Assets (ROA), Return on Equity (ROE) and Earning per share (EPS).

3.3. 2 Independent Variables

The independent variables include: ATM Card, credit card, Debit card and internet banking.

3.4 Conceptual Model

The conceptual of Model of this study is presented in the Figure 1.

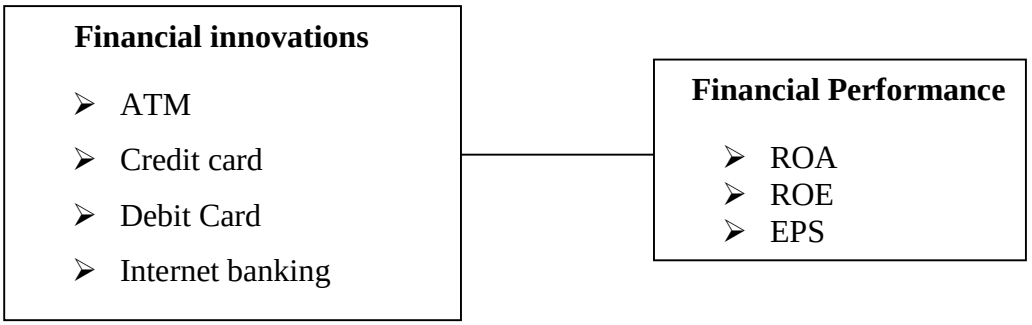

Figure 1. Conceptual Model

3.5 Explanation of variables

The performance of bank is dependent variable and it can be measured through following three elements: -

3.5.1. Return on Assets

Return on Assets (ROA) is a yardstick to measure how profitable a company is in terms of its total assets. The ROA gives a manager, investor or analysis an idea of how well an organization management can use their assets to earn a profit. Returns are shown in percentage.

3.5.2. Return on Equity

Return on equity (ROE) is measure through which total net income of a company is divided over paid up capital. This is very important from the point of view of shareholders because certain ratio of net profit is distributed among them in the form of dividend.

3.5.3. Earnings per Share

Earnings per share is also very important because net profit is divided on number of issued shares. The potential of company can be judged through its

earning per share. The new investors who are interested to invest in a company listed at Stock Exchange assessed the earning yield through earning per share because the highest earning per share, higher dividend distribution among shareholders.

The independent variables of the study are the followings: -

3.5.4. Number of ATMs

An ATM, representing an automatic teller machine, is a special computer that makes it easy for an account holder to manage and operate his bank account conveniently.

3.5.5. Number of Debit Cards

A bank card (debit card) is a plastic card that can be used to make online payment. It is the same as a credit card. Through debit card online transactions or online shopping can be made without cash. It saves the people from robbery.

3.5.6. Number of Credit Cards

Credit card is used for deferred payment. It means that you can purchase a good or services now by paying one month after and you can also avail some percentage of discount on your purchase.

3.5.7. Internet Banking

Online banking or web banking is an electronic payment system through which online transactions or payment of bills can be paid. It is very easy and convenient way of payment. Now the customers will not have to go shop or branch of a bank for payment of any bill. You can pay your bill through internet banking without pay any cost.

3.6 Model Specification

***3.6.1 Model I*:** Impact of Financial Innovation on Return on Assets (ROA)

$$ROA = \beta_o + \beta_1 ATM + \beta_2 CRCA + \beta_3 DECA + \beta_4 INB + u_i$$

Where;

ROA = Return on Assets

ATM = Number of ATMs

CRCA = Number of Credit Cards

DECA = Number of Debit Cards

INB = Internet Banking

***3.6.2 Model II*:** Impact of Financial Innovation on Return on Equity (ROE)

$$ROE = \beta_o + \beta_1 ATM + \beta_2 CRCA + \beta_3 DECA + \beta_4 INB + u_i$$

Where;

ROE = Return on Equity

ATM = Number of ATMs

CRCA = Number of Credit Cards

DECA = Number of Debit Cards

INB = Internet Banking

***3.6.3 Model III*:** Impact of Financial Innovation on Earning Per Share (EPS)

$$EPS = \beta_o + \beta_1 ATM + \beta_2 CRCA + \beta_3 DECA + \beta_4 INB + u_i$$

Where;

EPS = Earnings Per Share

ATM = Number of ATMs

CRCA = Number of Credit Cards

DECA = Number of Debit Cards

INB = Internet Banking

4. Empirical Analysis

4.1 Descriptive Analysis.

The results of descriptive statistics of all the variables used in a study are given in Table .1. The mean value of return on assets (ROA) is 1.2763, the median value is 1.035, the maximum value is 5.7, the minimum value is -0.17, the standard deviation is 0.8764, skewness is 2.153, kurtosis is 11.35, Jarque-Bera value is 202.53 it shows the normal distribution of the variable. The mean value of return on equity (ROE) is 16.557, the median value is 16.734, the maximum value is 30.76, the minimum value is -2.43, the standard deviation is 6.075, skewness is -0.536, kurtosis is 3.094, Jarque-Bera value is 2. 741.The mean value of earnings per share (EPS) is 0.150, the median value is 0.090, the maximum value is 0.410, the minimum value is 0.003, the standard deviation is 0.077, skewness is 0.409, kurtosis is 0.368, Jarque-Bera value is 4.090. These results are shown in Table 1:-

Table .1: Results of descriptive statistics

	ROA	ROE	EPS	ATM	DECA	CRCA	INB
Mean	1.2764	16.557	0.150	1064.290	933496.10	118519	322973.1
Median	1.049	16.734	.090	1173.25	409514	156878.9	354676.8
Max	5.7	31.76	410	2156	55185000	190000	1157000
Min	-0.17	-2.43	.003	245.10	103568.5	7190	18197
S.D.	0.8764	6.075	.077	513.100	1299960	62076.56	2423100
Skew	2.153	-0.536	.409	0.080	2.602194	-1.107	1.410
Kurt	11.35	3.140	.920	2.385	8.348780	2.300	4.984
JB-Test	202.52	2.241	.090	0.970	129.9553	12.367	27.3101
Pro	.000	0.432	0.090	0.620	0.00000	0.004	0.000
um	1.61	922.60	.911	59431.20	52270203	6636501	17527070
S. Dev.	2.35	2665.35	0.430	1452738	9.29E+15	2.12E+17	3.23E+17
N	56	56	56	56	56	56	56

Source: Author's Calculations

4.2 Correlation Analysis

Correlation analysis is used to check strength of relationship between variables. Its value goes from zero to one. The value of zero means that there is no correlation between two variables and one means that there is perfect relationship between variables. Our correlation results show that there is positive correlation between Return on Assets (ROA), return on Equity (ROE) and earning per share (EPS) and ATM, Debit Card, Credit Card and internet banking. All variables have positive and significant correlation with one another. The results of correlation analysis are shown in Table 2.

Table .2: Correlation Analysis

Variables	ROA	ROE	EPS	ATM	DECA	CRCA	INB
ROA	1.002						
ROE	0.520	1.002					
EPS	0.513	0.520	1.002				
ATM	0.154	0.008	0.520	1.002			
DECA	0.183	0.248	0.196	0.580	1.002		
CRCA	0.046	0.321	0.085	0.350	0.049	1.002	
INB	0.078	0.029	0.038	0.500	0.324	0.455	1.002

Source: Author's Calculations

4.3 ADF's Unit Root Test.

ADF's Unit root test is used to assess the stationarity among variables. Table .3 displays result of unit root test. Variables such as return on assets, return on equity, and online banking stand at a level (1 (0) while earning per share, numbers of ATMs, numbers of credit card users are stationers at first level (1(1). It means that the selected variables of this study are stationers at different levels and we can apply Auto- Regressive distributed lag (ARDL) model to analyze the impact of financial innovations on banking on the performance of banking sectors in Pakistan. The results of ADF Test are shown in Table 3.

Table .3: Result of Unit Root Test

Variables	Level				First Difference				Conclusion
	Intercept		Intercept and Trend		Intercept		Intercept and Trend		
	al.	**rob.**	**al.**	**rob.**	**al.**	**rob.**	**al.**	**rob.**	
ROA	4.970	007	- -	- -	- -	- -	-	--	I(0)
ROE	3.164	031	- -	- -	- -	- -	-	--	I(0)
EPS	- -	- -	- -	- -	7.689	001	-	--	I(1)
ATM	- -	- -	- -	- -	7.957	003	-	--	I(1)
CRCA	- -	- -	- -	- -	7.365	010	-	--	I(1)
DECA	- -	- -	- -	-	7.793	009	-	-	I(1)
INB	- -	- -	4.536	010			-	--	I(0)

Source**:** Author's Calculations

4.4 Bound Test-

Bound test is used to determine long run relationship between variables. Null hypothesis shows that there is no long run relationship between variables while alternate hypothesis shows that there is long run association between variables. The statistical value of F is 5.6408 and it is largest than critical

values and it shows there is long run relationship between variables. The results of Bound test are given in table .4.

Table .4: Result of Bound Test

Null Hypothesis: No long-run relationships exist		
Test Statistic	**Value**	**K**
F-statistic	5.6408	4
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	2.57	3.36
5%	2.89	4.25
2.5%	3.32	4.57
1%	3.71	5.09

Source: Author's Calculations

4.2 ARDL Approach

The ARDL model is used to determine long run relationship between variables. The dependent variable is performance of bank while independent variables are ATM, credit card numbers (CRCA), the number of debit card (DECA) and online banking (INB). The results show that number of ATMs, the numbers of credit card users, the numbers of debit card users, and online banking have a positive impact on bank performance as measured by the return on assets. The results are shown in Table 5.

Table .5: ARDL Analysis

Dependent Variable:				
Selected Model: ARDL(1, 2, 3, 2, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ATM	0.5570	0.2723	2.0455	0.0056
CRCA	0.1263	0.0436	2.8969	0.0490
DECA	0.0378	0.0452	0.8362	0.0943
INB	0.0493	0.0160	0.8081	0.0496
C	0.4802	0.4406	1.0899	0.0736

Source**:** Author's Calculations

The results in table 5 shows that coefficient value of number of ATMs is 0.55.70 which shows in one unit changes in number of ATMs it will likely to crease performance of banks by 55.70 percent. This variable has positive and significant impact on dependent variable. The t-statistic value is (2.0455) and the probability value is (0.0456) which suggest that the association is significant at 5 percent significant level. These results are confirmed by the study of Gündoğdu & Taşkin, (2017). The number of credit card users (CRCA) is also found to be positively related to return on assets. The t-statistic score is (2.8969) and probability value is (0.0390) which suggest that the association is significant at the 5 percent level. The coefficient value shows, if one unit increases in the number of credit card users the performance of the banks will likely to increase by 12.63 percent in the long run. These results are consistent with the results of Gündoğdu & Taşkin,(2017). The independent variable, internet banking (INB) is found to be positively and significantly associated with performance of banks. The t-statistic score is (0.8081) and the probability value (0.0496) which suggest that relationship is significant at 5

percent level. The coefficient value reveal, if one unit increases in the internet banking it will likely to increase the performance of the banks by 4.73% in the long run. Online banking means that consumers can access their own banking sites, thus reducing the cost of banking operations. These results have also consistent with results of the studies of Akani and Tony-Obiosa, (2020).

Model-I: Impact of financial innovation on Return on Assets

The results of ARDL mode are shown in Table 6.

- **Table .6: Impact of Financial Innovation on (ROA).**

Co-integrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(ATM)	1.0263	0.4069	2.5222	0.0169
D(ATM(-1))	-1.1312	0.4210	-2.6869	0.0100
D(CRCA)	-1.1024	0.5001	-2.2044	0.0347
D(CRCA(-1))	-0.0646	0.6689	-0.0966	0.0324
D(CRCA(-2))	-0.8125	0.5147	-1.5786	0.1276
D(DECA)	-0.0534	0.0213	-2.5070	0.0103
D(DECA(-1))	0.0301	0.0215	1.4000	0.1723
D(INB)	0.0341	0.0701	0.4864	0.6656
CointEq(-1)	-0.7015	0.1367	-5.1317	0.0001

Table .6 shows the analysis of the ARDL model. This analysis is helpful in determining whether long-term relationships exist between variables or not. F -statistic value is 6.6478 which is greater than critical bound values so it is proved that there is long-run relationship between financial innovation and return on assets.

Model-II: Impact of Financial innovations on Return on Equity

The results of ARDL model are shown in table 7 regarding impact of financial innovations on return on equity.

Table .7: ARDL Bound Test Long Run Analysis

Null Hypothesis: No long-run relationships exist		
Test Statistic	**Value**	**K**
F-statistic	6.6478	4
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	2.53	3.57
5%	2.93	4.09
2.5%	3.35	4.70
1%	3.64	5.08

Source**:** Author's Calculations

Model III: **Impact of Financial Innovations on (ROE).**

Table 8 shows the ARDL long-run estimate of the impact of financial innovation on return to equity. The dependent variable in the model is the return on equity while independent variables are the of ATMs (ATM), numbers of credit card users (CRCA), numbers of debit card users (DECA), and internet banking (INB). The results show that the variables numbers of ATMs, number of credit card users, numbers of debit card users, and internet banking have positive impact on banking performance in the long run as measured by return on equity. The results are shown in Table 8.

Table .8: Impact of Financial Innovations on (ROE).

Dependent Variable: ROE				
Selected Model: ARDL(1, 0, 0, 1, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ATM	1.1906	5.5207	0.2167	0.8512
CRCA	9.6419	4.4269	2.1780	0.0378
DECA	0.0748	0.2197	0.3405	0.7507
INB	1.9906	1.0147	1.9618	0.0493
C	10.7601	5.2178	2.0622	0.0489

Source**:** Author's Calculations

The data in Table .8 show that variable numbers of ATMs (ATM) is found to be directly associated with the ROE. The t-statistic value (0.2167) and probability value (0.8518) suggest that this association is statistically insignificant. The coefficient value shows if one-unit increase in the number of ATMs increases it will likely to increase the performance of bank by 11.9%. Similarly, the variable, number of credit card users (CRCA), has positive and significant relationship with return on equity. The t-statistic value (2.1780) and probability value (0.0378) suggests that this association is significant at the 5 percent on level. The coefficient value infers if one unit increases in the number of credit card users it will likely to increase the performance of the bank by 9.64%. These results are also confirmed by the study of Gündoğdu &Taşkin, (2017). The variable, numbers of debit card users (DECA) is also found to be positively related to the return on equity. The t-statistic value (0.3405) and probability value (0.7507) suggest that this association is statistically insignificant. The coefficient value shows that one unit increases in the number of debit card users the performance of the bank will be increased

by 7.4 percent as calculated by return on equity. The variable, internet banking (INB) is found to be positively and significantly related with return on equity. The t-statistic value (1.9618) and probability value (0.0444) indicates that this association is significant at 5 percent level of significance. The coefficient value shows if one unit increases in the internet banking it will likely to increases the performance of the bank by 19.9 percent as measured by return on equity. These results are also confirmed by the findings of Akani &Tony-Obiosa (2020).

The long run results of Model-III relating to the impact of financial innovation on earning per share (EPS) are shown in Table 9. The Bound test result show that F-statistic value is 4.4417 which is greater than all critical bound values so it is established that there is long-run relationship between financial innovation and EPS.

Table .9: ARDL Bound Test Analysis

Null Hypothesis: No long-run relationships exist		
Test Statistic	**Value**	**K**
F-statistic	4.4417	4
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	2.53	3.61
5%	2.89	4.12
2.5%	3.42	4.54
1%	3.96	5.13

Source**:** Author's Calculations

Table .10 shows the ARDL long-run relationship impact of financial innovation on earnings per share. The dependent variable is earnings per share

while independent variables are the number of ATMs (ATM), numbers of credit card users (CRCA), numbers of debit card users (DECA), and internet banking (INB). The results show that the variables numbers of ATMs, numbers of credit card users, numbers of debit card users, and internet banking have positive and significant impact on banking performance. The detail of results is shown in the following table:

Table .10: Impact of Financial Innovation on (EPS)

Dependent Variable: ROE				
Selected Model: ARDL (1, 0, 0, 1, 0)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ATM	0.1994	0.0991	2.0121	0.0347
CRCA	0.1436	0.0710	2.0225	0.0479
DECA	0.0150	0.0056	2.6786	0.0134
INB	0.0079	0.0179	0.4413	0.6810
C	0.0384	0.0868	0.4424	0.6645

The results in table 10 show that the variable, number of ATMs (ATM) has positive and significant relationship with earnings per share. The t-statistic value (2.0121) and probability value (0.0347) suggest that this relationship is statistically significant at 5 percent level. The coefficient value shows that if one unit increases in the numbers of ATMs the performance of the banks will likely to be increased by 19.94%. The variable number of credit card users (CRCA) is found to be positively and significantly related to the earnings per share. The t-statistic value (2.0225) and probability value (0.0479) suggest that

this association is significant at the 5 percent level of significant. The coefficient value shows if one unit increases in number of credit card users it will likely to increases the performance of bank by 14.36 %. The variable number of debit card users (DECA) is also found to be positively and significantly related to the earnings per share. The t-statistic value (2.6786) and probability value (0.0134) suggest that this association is statistically significant. The coefficient value reveals that if one unit increases in the number of debit card users the performance of the bank will likely to be increased by 15%. The variable internet banking (INB) has positively relationship with earnings per share. The t-statistic value (0.4413) and probability value (0.6810) suggest that this association is statistically insignificant. The coefficient value shows if one unit increases in internet banking the performance of the banks will likely to be increased by 0.07%.

5. Error Correction Model

The error correction model shows the speed of correction from the short-run to the long-run equilibrium. The CointEq (-1) value should be negative and statistically significant and this situation is also found in this analysis. The CointEq (-1) value is -0.3189 it suggests that any errors in the short run are adjusted about 31.89 percent when moving from the short-run showing long-run. The short run results of the impact of financial innovation on return on equity (ROE) show that ATM card users, number of debit card users and internet banking have negative relationship with banks performance as measured by return on equity while credit card has positive relationship with bank performance in the short run. The results are shown in table 11.

Table .11: Impact of Financial Innovation on (ROE):

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(ATM)	-0.3493	1.7357	-0.2012	0.8423
D(CRCA)	3.0761	1.1926	2.5793	0.0147
D(DECA)	-0.3017	0.0936	-3.3223	0.0026
D(INB)	-0.5886	0.3445	-1.7086	0.0978
CointEq(-1)	-0.3197	0.0994	-3.2163	0.0054

Source: Author's Calculations

The short run results of Error Correction Model are shown in table 12 which shows that the number of ATM cards users have positive relationship with the performance of banks in the short run while other variables such as the number of debit card users, credit card users and internet banking have negative relationship with performance of banks as measured by earning per share (EPS) as shown in table 12.

Table .12: Impact of Financial Innovation on (EPS)

Co-integrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(ATM)	0.0567	0.0247	2.2955	0.0263
D(CRCA)	-0.0659	0.0316	-2.0854	0.0379
D(DECA)	-0.0025	0.0014	-1.7857	0.1851
D(INB)	-0.0045	0.0068	-0.6618	0.6793
CointEq(-1)	-0.1978	0.0947	-2.0887	0.0394

6. Findings and discussions

The objective of this study was to analyze the impact of innovation on the performance of banks. The banks include into the sample were: Habib bank limited, Allied Bank limited, United bank limited, Bank Al Habib, Bank Alflah Limited, Faisal Bank Limited, Meezan Bank Limited, Muslim Commercial Bank, and Bankislami Pakistan Limited, National Bank of Pakistan, The Bank of Punjab, Habib Metropolitan Bank, Askari Bank. The dependent variable was the performance of banks and independent variables include the number of ATM card users, the number credit card users, the number of debit card users and internet banking. Descriptive statistics were used to describe characteristics of variables. The ADF unit root test show that the variables of the study were stationers at different levels so we used ARDL model to determine long run relationship between financial innovation and performance of banks. Error correction model was applied to ascertain short run relationship between financial innovations and performance of banks. We used correlation analysis to check strength of relationship between variables. Results ARDL results show that increase in the numbers of ATMs, the numbers of credit card users, the numbers of bank card users, and online banking have a positive impact on the performance of banks as measured by return on assets, return on equity and earning per shares. The short run results of Error Correction Model show that the impact of financial innovation on return on equity (ROE) show that ATM card users, number of debit card users and internet banking have negative relationship with banks performance as measured by return on equity while credit card has positive relationship with bank performance in the short run. Whereas the number of ATM cards users

have positive relationship with the performance of banks in the short run and other variables such as the number of debit card users, number of credit card users and internet banking have negative relationship with performance of banks as measured by earning per share (EPS in the short run.

7. Conclusion

From the above results we can conclude that financial innovations taken place in the banking sector during last one decade has brought significant change in financial services. Covid-19 pandemic also forced banking sector to introduce different types of digital banking to enable to their customers to make financial transaction as well as buying and selling from their homes without moving to shopping malls. This was a miraculous transformation from traditional banking to digital or internet banking. This was become possible due to revolution of information technology which enable banks to continue their business without involving their man power at large scale. This not only reduces the cost of transactions but also improve their efficiency. It also enhances the confidence of customers over safe online banking. The results of sampling banks show that their profitability was substantially increased due to opting financial innovations which also expand the scope of financial services in Pakistan. We also conclude that financial innovations in banking sector are an imperative need for expansion of financial inclusion and expansion of financial services to rural areas of Pakistan as the outreach of financial services in Pakistan is still around 15 percent. So the financial services can be expanded further and customers can be attracted through generating awareness and offering attractive saving rates. It is noted during this study that those banks which have opted latest information technology retain loyalty of their customers and earn high profit as compared to those banks which opted

information technology slowly due to resistance from their employees. The results show that privately managed banks earned high profit and declared high rate of dividend during the study period as compared to public sector banks who were either declare no or low dividend. It proves that financial innovations do not only enhance the efficiency of banks but also improve their profitability as well as loyalty of their customers.

8. Policy Recommendations

Following are the recommendations to improve the financial performance of banks in Pakistan:

- Internet banking should be expanded in order to widen the scope of digital banking in Pakistan. It will enhance the competitiveness and quality of services of banking.
- The necessary measures should be taken by the State Bank of Pakistan (SBP) to reduce the fraudulent risk associated with electronic payments, which will ultimately increase customer confidence in the use of electronic payment modes.
- State Bank of Pakistan should direct commercial banks to establish their branches in the remote areas so that the people living there can avail banking services. It will also increase savings in the country.
- The banks must reduce different charges charged from customers as service fee. These charges sometimes exceed the profit given to the customers which discourage the people to keep deposit in the banks or avail banking services. This can be done through financial innovations only.
- To reduce the cost of banks and improve financial innovation, banks should improve their infrastructure and also promote online banking.

9. Research Contribution

This research substantially contributing into the existing literature on the relationship between innovations and performance of banking organization. This research strengthens Schumpeter's theory of innovation which states that innovations not only disrupt the market but also destroy the old ones. Our empirical study has proved this theory on the ground that those banks which opted or launched innovative products recorded steep growth in their profitability and these banks include Habib Bank Ltd, United Bank Ltd, MCB Bank Ltd, Allied Bank Ltd,etc, while those which provided banking services in traditional way not only lost confidence of their customers but also earn lower profit and these banks include National Bank of Pakistan, Bank of Punjab Ltd, Summit Bank, Samba Bank, and Soneri Bank Ltd, etc. So this study not only contributed theoretically but also empirically proving that innovations are the engine of growth in the existing business world.

10.Direction for Future Research

The study provides a base for future research as the future research can also be conducted to examine the impact of working environment on productivity of employees in banking sector. More banks and variables can be included into the sample to draw broad results or comparative study can be made between conventional and Islamic banks in terms of innovations and resultant profitability. The impact of innovations on banking sector can specifically be measured in the period of Covid-19, how banks provided financial services to their customers and maintained their operation successfully to sustain their profitability. This study and its results are

restricted to Pakistan and cross-country data can be used to analyzed the impact of innovations on the performance and profitability of banks.

Acknowledgement

The authors are grateful to the anonymous referees of the journal for their extremely useful suggestions to improve the quality of the article.

Declaration of Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding:

The authors received no financial support for the research, authorship and/or publication of this article.

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Both authors jointly carried out this research study and collaborated each other. The author 1 collected data, conducted its statistical analysis. She prepared initial draft of manuscript. The Author 2 helped Author 1 in selected of title of research, guided in statistical analysis and formatted final draft of manuscript. Both authors carefully read final draft of manuscript and find it fit for publishing. Both authors fully followed ethical values during the course of this research work.

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