Original Article

The Beginning of Digital Technology: The Impact of Financial Technology on the Performance of Banking Sector in Pakistan

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Access This Article Online
Quick Response Code
DOI
10.62019/BRDR.03.02.08
Volume: 3 | Issue: 2
Pages: 70-77
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How to Cite This Article
Kalsoom Akhtar, K., Nawaz, N., Tara, N., Rehman, M (2023). The Beginning of Digital Technology: The Impact of Financial Technology on the Performance of Banking Sector in Pakistan. *Business Review of Digital Revolution*. 3(2), 70-77.

Received:	28-Aug-2023
Revised:	11-Dec-2023
Accepted:	22-Dec-2023
Published:	31-Dec-2023

Abstract

The objective of this study is to investigate the influence of financial technology on the financial performance of a bank. This study uses the three factors of financial technology which are total number of mobile account users, total mobile transactions and value of money rather than focusing on one component. This study collect data from 15 commercial banks of Pakistan using the purpose sampling technique. The financial performance of banks is measures through four ratios which are return on equity (ROE), return on asset (ROA), yield on earning (YOE) and profit margin (PM). Some firm-specific control variables include firm size, age, market capitalization and capital ratio and macroeconomic controls variables are included deposit growth, inflation and GDP growth. The result shows that financial technology transactions have a significant positive impact on banks' performance. The impact of total number of mobile account users and value of money does not trigger the banks performance. Financial technology transactions improve bank performance as the impact is positive and significant. Increasing number of mobile transactions boost the performance of commercial banks of Pakistan. As the financial technology improving banking performance state bank of Pakistan should set regulations about financial technology adoption of all banks and there should be level of investment provided by the state bank of Pakistan. This study provides insight to the new researchers about financial technology and its importance in the banking sector. This study enriches literature on financial technology in the context of commercial banks.

Keywords: Banks Performance, Digitalization of Banking Services, Financial Technology, Mobile Transactions, Value of Money.

1. Introduction

Financial technology is an integral part of the banking field. It is an integration of financial and technology. Financial related to the banking sector and technology related to the automation of different procedures, software's and techniques. Due to innovations the financial sector and business environment are changing continuously. Services provided by the banks are Internet Banking, SMS and Phone banking, Fund Transfer, Online Bills Payment, access of account information everywhere, RTGS, Credit and Debit cards, and Auto and Home finances. Customers that cannot go to the different branches can easily manage their transactions online (Ali et al., 2019).

The main objective of this study is to analyze the impact of financial technology on the performance of banking sector in Pakistan. This study confirms whether FINTECH has a significant impact or not and helps banks to manage the investment in financial technology to generate profit. The dependent variable of the study is financial performance, it is related to profitability. Different studies were based on the explanation regarding financial technology. Some of them identify the challenges and opportunities for the financial technology, the development and risk assessment techniques, identify innovative techniques and models or the future progress and opportunities in financial technology sector (Arner et al., 2015; Błach, 2011; Dorfleitner et al., 2017; Kalmykova & Ryabova, 2016; Puschmann, 2017; Schindler, 2017; Vaškelaitis, 2010; Walker, 2017). The current study attempts to expand the literature on financial technology in banks and legitimizes the connection between banks financial performance and FINTECH to guarantee that consideration is productive. This study will make a considerable

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theoretical contribution. Moreover, the conclusion of this study is useful for the policymakers as FINTECH has significant impact on performance then it is important for the banking sector to create awareness of FINTECH in employees and invest more to increase profitability.

The banking sector is affected by technological change and is adopting innovations to face the challenges in the market. FINTECH has changed the operations of banks and influenced overall performance, so this study is going to address three main objectives. It examines the impact of financial technology users, transactions and value of money on the financial performance of the banking sector of Pakistan. According to this objective the research questions of the study are:

- Is there any impact of financial technology users on the performance of the banking sector of Pakistan?
- Is there any impact of financial technology transaction on the performance of the banking sector of Pakistan?

The participants of this study are commercial banks and the data collected from these banks will not be used for the illegal purpose that harms the participants. This research is not harmful as the data of these banks is only used in this research which is useful for the banking sector.

2. Literature Review

The banking sector provides different services and products to enhance performance and profitability. Performance of the banking sector is the dependent variable of this study. Profitability can be measured using different ratios, for instance ROE, that measures the growth and profitability which is more significant than other measures. ROA is the management's capability to obtain funds for the cheaper cost and make a profitable investment. This ratio shows the profitability and income that is created through the investment in assets. The innovative financial technology, information and communication technology are playing great role in the field of financial services and minimizing the cost of financial services (Berger, 2003; Thakor, 2020; Zavolokina et al., 2016). Liquidity maximizing, increasing investment opportunities and the way of managing the risk and increasing or extending its efficiency are some benefits of FINTECH (Błach, 2011). These innovations include biometric systems, e-banking, big data and robots and artificial intelligence. Financial technology work includes the securitization of the data, digital payments, online lending, risk management, financing and speculation and provides the new edge for the customers (Rodin et al., 2019).

Financial technology have brought many deviations in the financial services including online banking, ATM, credit cards, electronic payments and digitalization (Wonglimpiyarat, 2017). These financial services allow customers to use banking facilities at any place or time without any threat (Tam & Oliveira, 2017). The other services provided by FINTECH includes Insurance Tech, Crowd Funding, Artificial Intelligence, Big Data, Blockchain and Robo-Advisory. The development in the financial technologies extending the efficiency of the services (Brătăşanu, 2017). Benefits gained through mining and examining the data include the advantage of the improved recognition of fraud and fake data. FINTECH is also providing digital lending services for customers. Easy access to financial services through e-banking enables customers to maintain their transactions (Chawla & Joshi, 2017).

The reduction in the transaction cost allows the financial institutions to increase the adoption of new technology or FINTECH, enhance the capabilities of management and increase the size of transaction through lower cost and provide innovative and more financial services. By offering more financial services through unique models of technology banks can enhance the performance (Merton, 1995). A study conducted in Spain finds the impact of FINTECH on the financial sector performance and finds that FINTECH increase the deposits and customer also and it can create the positive impact on performance (Hernando & Nieto, 2007).

A study conducted in Kenya finds the impact of mobile banking on the banking sector performance based on the number of users and value moved on a monthly basis. The data were collected from the period of 2007-2011 and used mobile banking as a component of financial technology and finds the impact of FINTECH on banking performance. The results report that there is a positive but insignificant impact of financial technology on banking performance (Mutua, 2013).

Some studies suggest that FINTECH plays a role as an opportunity for the banking sector because this is providing unique and innovative services in cost-effective ways therefore banks can gain market share by adopting new models. Some researchers say that there is a positive relationship between the profitability and internet banking and digitalization of banking field (DeYoung, 2005; Kagan et al., 2005; Tunay et al., 2015).

A study is conducted in the Swedish through the semi-structured interviews from the executives of banks shows that there is the modification in the financial industry due to the innovative technology and also has the impact on the banking sector. This study concluded that there is positive relationship between the FINTECH and the banking sector (Almoustafa Alterkawi & Bittar, 2019).

FINTECH have changed the traditional way of banking and has the potential to create comfort for the customers through the use of mobile banking. So, most of the literature suggesting the positive results and in Pakistan also many commercial banks are operating under the FINTECH and this study analyze the relationship between the FINTECH and the banking sector of Pakistan. Mobile banking gaining popularity and growing to contribute the digital innovation and the technological era (Brandl & Hornuf, 2017).

FINTECH has different elements such as mobile banking, internet banking, and ATM banking. This study uses mobile banking to identify the impact of FINTECH on banks' financial performance. Mobile banking is measured through three components; total number of registered mobile account users, total number of transactions and the value of money of these transactions (Cyree et al., 2009; Mustapha, 2018).

Mobile account users represent the number of customers who use the mobile banking. Users are registered on the mobile application portal, access their bank accounts to send and receive money, check their account balance or pay bills. Thus, the proposed hypothesis is as follows:

There is positive impact of financial technology users on the performance of banking sector of Pakistan.

3. Methodology

Many researchers uses the profitability to measure the performance (Bektas, 2014; Bikker, 2010; Cyree et al., 2009; DeYoung, 2005; Shah & Jan, 2014; Trivedi, 2015). There are different control variables in this study, some of them are macroeconomic which are GDP and inflation, and the others are firm specific which consist of size, ratio of equity to total assets (CAP) and annual growth of deposits (GD). In this research the deductive approach is used because quantitative method used in study. The theory and hypothesis are developed in this research and the step-by-step procedure is followed to test the hypothesis. The quantitative approach is used to collect data about the different ratios regarding banking performance which includes ROA, ROE, PM and YOE.

In this research the non-probability or non-repetitive sampling technique is used through which data can be easily generalized through the use of statistical tools. This method allows you to select samples and generalization of the results is also possible. The researcher wants to evaluator judge the population elements statistically (Saunders et al., 2009).

According to SBP, 34 banks are operating in Pakistan. Four specialized and five foreign banks are excluded from the study, other 25 commercial banks (20 private and 5 government banks) (State Bank of pakistan, 2019). The target population of this study are commercial banks in Pakistan and sample size is 44% of the target population. 15 out of 25 commercial banks are included in the sample because other banks have not been using mobile applications for the last 6 years.

Results

Panel analysis is the part of the study and impact analyzed through panel regression analysis. Random and fixed effects selected through the values of hausmen test. All variables, description and sources are given in Table 1 and Figure 1. Furthermore, expected sign of relationship is also given.

Table 1: Hausmen Test.

Variables	ROE	ROA	YOE	PM
FINTECH (users)	-5.81	4.42	8.68	-1.95
	(0.884)	(0.171)	(0.618)	(0.000)
FINTECH (transactions)	6.09**	3.56**	4.80	1.05
	(0.002)	(0.039)	(0.607)	(0.643)
FITECH (value)	-3.35**	-3.78**	-4.80	1.02
	(0.025)	(0.003)	(0.488)	(0.482)
SIZE	0.1109***	0.00635***	.00596	-0.0005
	(0.000)	(0.001)	(0.573)	(0.924)
CAP	0.0664	0.1547***	-0.167	0.1735***
	(0.797)	(0.000)	(0.870)	(0.001)
DG	-0.0345	-0.00626**	-0.0899	0.00027
	(0.298)	(0.032)	(0.568)	(0.931)
INF	-0.63419**	-0.0322	-0.8543	-0.0663**
	(0.036)	(0.246)	(0.569)	(0.017)
GDP	-1.5188**	-0.1082**	-3.1403	-0.17140***
	(0.006)	(0.030)	(0.243)	(0.002)
CONS	-1.0320	-0.0669	-0.3645	0.0269
	(0.0000)	(0.002)	(0. 759)	(0.707)
R-squared	0.3335	0.6656	0.0279	0.1865
Observation	90	90	90	90
Significant at the level of 1%, 5% and 10% which shows ***, ** and *				

The coefficient of the users shows the negative sign it means the relation between users and return on equity is negative as the number of users increase the ROE decreased but this relation is insignificant as the p-value is greater than 0.05 which shows that results indicate the impact of users on ROE is negative as the number of users increased it has smaller impact because the relation is insignificant and R^2 is also 33%. R-square shows the ratio of variance in the ROE in response to the change in the users and the above results show that negative and insignificant impact of mobile account users. Results indicate the insignificant impact of users on the ROA and direction of relation is positive. The result reports changing in YOE and coefficient becomes positive and p value is greater than the 0.05 which shows insignificant impact of users on yield.

The impact of size on ROE and ROA is significant and positive. In this research size has a significant impact on performance but due to the smaller coefficient there is a weak relation that exists. In this study log of total assets is used as a proxy of commercial banks size. As size is measured through assets large banks can use these assets as collateral to generate more funds that's why size creates positive impact on performance. Large-size banks have a focus to achieve economies of scope and economies of scale. So these banks impact more on performance than small banks and these studies also support the findings of current research that size have significant and positive impact on performance (Phan et al., 2020). The above result shows that there is a positive and significant impact of size on two main ratios as the p-value is acceptable and in yield the coefficient is positive, but the results are insignificant.

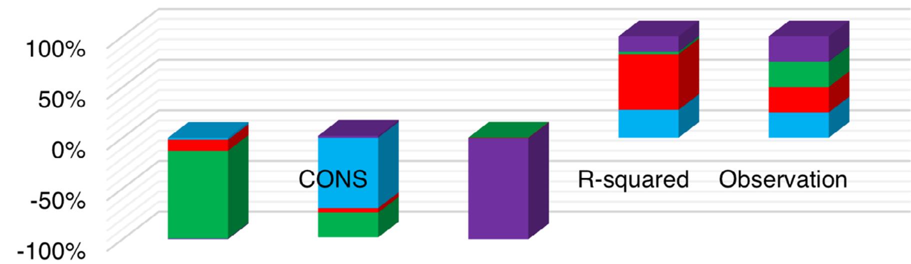

Figure 1: Hausmen Test.

The second control variable is Deposit Growth. Greater deposit growth can create negative impact of performance as the companioning the market increased and reduce profits and there are negative impact of DG on performance by Demirgüç-Kunt and Huizinga (1999), positive impact by Naceur and Goaied (2001) and mixed results by Dietrich and Wanzenried (2014). According to the results of this study increasing deposit decrease the three indicators as banks collect deposits but are unable to invest in profitable projects and the impact is insignificant in three indicators.

The impact of CAP on the banking performance is unambiguous. The higher ratio of equity impacts positively on banking performance and increases the profitability of the banking sector. Banks with higher capital ratio also saves the cost of interest due to the least portion of debt and this increased profitability (Berger, 1995). Higher capital ratio reduce the risk of bankruptcy cost and there is negative side that increasing the capital reduces the benefit of tax shield of debt or due to uncertainty in the market it has negative impact on performance (Osborne et al., 2012). In this research the impact of CAP is expected as it can be positive or negative. In these result ROE has positive and insignificant results and ROA positive and significant results means cost reduction increase the profit of assets and the other two ratios show insignificant impact.

There are two macroeconomic control variables in the study. Inflation and GDP impact the banking sector in different ways. In this research the results show negative impact of inflation on performance and the reason is that in first years there is consistency in the inflation and in 2019 the rate of inflation is increased more than in previous years and banks have to face loss in the form of interest.

The impact of GDP growth on performance depends on the business cycle. If the cycle is decreasing or there is a recession, then it creates a loss of loan and affect negatively. The impact is positive in the reverse condition if the cycle is on boom trend, then demands of loan increase. Moreover, in the literature positive impact is dominating that why this research assumes positive impact (Albertazzi & Gambacorta, 2009; Athanasoglou et al., 2008; Dietrich & Wanzenried, 2014). The results of this study show negative and significance in two ratios and insignificant in two other ratios because of the business cycle.

Table 2: Results.

	ROE	ROA	YOE	PM
MV1	4.84**	3.00**	3.49	4.50**
	(0.006)	(0.050)	(0.878)	(0.091)
MV2	6.46	1.08**	-2.32	-.00258***
	(0.158)	(0.035)	(0.578)	(.000)
fA1	-.013324***	-.00172***	.0061	-5.01***
	(0.001)	(0.000)	(0.214)	(0.147)
fA2	-0.0019	-0.0005	0.00689	-0.00042
	(0.513)	(0.132)	(0.801)	(0.852)
Significant at the level of 1%, 5% and 10% which shows ***, ** and *				

Two bank characteristics are considered which are Market Value and Firm Age. Table 2 and Figure 2 show the impact of highest market value, positive impact of three indicators of performance and significant also. The reason is that these banks contain maximum shares of the market and create more profit. On the other hand, mature firms impact negatively and significantly as these firms bear more cost. These results are consistent with the other study conducted in Australia (Phan et al., 2020).

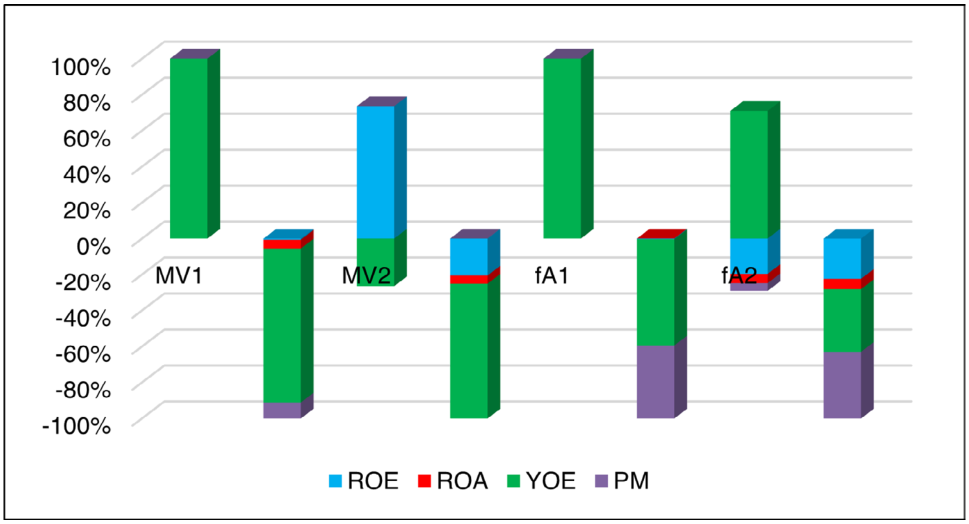

Figure 2: Results.

4. Discussion

Financial technology users indicate a negative and insignificant impact on the performance of the banking sector in Pakistan. H1 is rejected and results suggest that there is a negative but weak and insignificant impact. These results are consistent with the finding of (Mutua, 2013; Phan et al., 2020). The results suggest that the number of mobile banking users has an insignificant impact on the bank's performance. People are moving toward mobile banking and FINTECH, but it cannot influence the banks' performance. These results are consistent with the (Gitau, 2011; Mwange, 2013; Nyaga, 2017; Steven, 2002).

The second hypothesis of the study is accepted because there is a positive and significant impact of transactions on banking performance. The coefficient (6.09, 3.56, 4.80, and 1.05) shows if transactions increased, the performance of the banking sector also increased, or the relationship is significant and strong as p values (0.002, 0.039). The result shows ROA and ROE are significantly affected by the transactions, that means an increase in the transactions increases the bank's overall return and shareholder's wealth. Financial intermediation theory supports this result as adopting financial technology decreases the cost and increases the profitability. By mobile transactions more people connect with the banks and increment in the transaction can generate more profit. This research in line with the results of other research (Gitau, 2011; Nyaga, 2017; Steven, 2002).

The value of money is inversely related to the performance according to the coefficient (-3.35, -3.78, -4.80, 1.02) these values predict one performance indicator positively and three performance determinants negatively but the p-value is insignificant. The positive relations show that by increasing the value of money the performance indicators also increased according to the coefficient. Financial intermediation theory also supports here because there is a positive impact of value on performance, but the hypothesis is rejected as the overall impact is insignificant.

The impact of size on the performance of the banking sector is positive as expected. Increasing one unit size can increase return on equity (.1109) and the impact of size is significant because of p-value < 0.05. Commercial banks with larger sizes have more assets and these assets can be used as collateral and banks can generate more profit. As size reduce the cost because of economies of scope and scale.

Table 3: Summary of Hypotheses Results.

Hypotheses	Conclusion
H1: There is positive impact of financial technology users (FINTECH) on the performance of banking sector of Pakistan.	Not supported
H2: There is positive impact of financial technology transactions (FINTECH) on the performance of banking sector of Pakistan.	supported

5. Conclusion and Recommendations

Financial technology is an imperative part of the banking sector because innovative techniques create a competitive advantage. Mobile banking is a component of financial technology as it saves cost and time and creates efficiency in the system. The data set of this study is 15 commercial banks from 2014-2019. The panel data regression analysis performed to find the impact and four measures of banking performance is used in this study which are ROE, ROA, YOE and Profit Margin.

According to the finding of this study, financial technology transactions have a positive impact on banking performance and the impact is significant. As the performance increased through the FINTECH transactions then it is important for the banking sector to invest in financial technology or adopt the new techniques that increase the banking sector's performance. Banks face competition in this sector as FINTECH companies are working independently and providing cheap services. The authentication of the system of financial technology makes the customer more confident in performing mobile transactions. Financial technology makes the banking sector open to experience innovative models. According to the financial intermediation theory the impact of financial technology is positive because innovative techniques reduce the cost and make financial services efficient. Theory also supports the result of this study as the impact of financial technology transactions is positive and significant.

Firm-specific control size also has a significant and positive impact on banking performance. As more assets can be used as collateral for cheapest debt and large size commercial banks decreased the cost by economies of scope and economies of scale. As a result of large size banks can attract more customers and can also increase the customer base. Capital ratio also has a positive impact on banking performance because more capital ratio decreases the cost of bankruptcy. Deposit growth negative impact on performance because commercial banks collect deposits but are not investing in positive projects or high return projects. Inflation and GDP growth show a negative impact because of the anticipation of inflation.

As the finding shows positive impact of financial technology transactions on commercial banks in Pakistan than commercial banks should improve the FINTECH system and increase the efficiency of the system and ensure the customer about their safe transactions. Adopting new techniques creates effectiveness in the system and also benefits the banks in terms of cost reduction. Decreasing cost of transaction for users derives profitability and performance to the positive side.

There should be regulations by the State bank of Pakistan for all banks to maintain a level of investment in FINTECH and provide financial services through mobile applications. They should maintain an optimal level of equity for increasing performance or wealth. Commercial banks should make reliable anticipation of inflation as unanticipated inflation decreases their performance. There should be Basel iii regulation for banking systems to adopt financial technology to maximize performance.

Limitations

There are some limitations of this study as this uses the secondary data technique which causes some inappropriate results, and this technique is quantitative therefore the results create some inefficiencies, and the validity of data is less as compared to primary research. Increased sample size can create more precise and momentous results. The stretched timeframe can also make the impact strong and significant, for instance 10 years.

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