

EFFECT OF DIGITAL BANKING ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN QUETTA

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Abstract

Digital banking has become the norm due to technological advancements, and most commercial banks are incorporating e-banking into their business strategies. The study's goal is to determine how digital banking affects the profitability of Quetta City's commercial banks. The quantitative study focuses on five banks from 2018 to 2024, with profit margin as the dependent variable and ATM count, POS installations, debit card count, and monthly income and expense (MIE) transaction value as independent variables. The study's findings demonstrated a substantial correlation between the number of ATMs, POS installations, and MIE value and the bank's profitability. Several debit cards have been found to have no appreciable effect on profitability.

INTRODUCTION

Pakistan's banking sector has grown rapidly and gained recognition by adopting a range of technical methods to enhance the quality of its offerings (Bukhari, 2023). According to Dzombo et al. (2017), civilization is currently entering the so-called digital age. Society now has additional instruments, thanks to technology and the Internet, to challenge established norms and ways of thinking. Furthermore, computers have occupied significant space and influenced all facets of society, driving 21st-century organizational practices (Jepchumba & Simiyu, 2019). The causes include innovative and disruptive corporate practices, the proliferation of new digital technology, and the emergence of new models. Kiragu (2017) asserts that by bringing new benefits to the market, such as increased simplicity, ease of use, and lower costs, the disruptive and innovative business

model instantly challenges established goods and services. In this sense, Pakistan's banking sector has been growing and becoming better known by adopting a variety of technological solutions to improve the quality of its offerings. According to Kamande (2018), electronic measures act as financial middlemen in the banking sector. They are used to develop innovative financial services on digital platforms, facilitating customer engagement and promptly meeting customer needs through fast access. Small- and medium-sized enterprises operating in Pakistan are the key references and reports on the issue. It is consistent with the study conducted by Hallunovi & Berdo (2018), which classifies digital banking by the products and financial services provided. Nevertheless, according to OWADE (2018), digital banks are a subset of companies that

use the fintech business model. The business model of Interbank has the potential to generate more effective returns than the traditional banking model, according to a previous study by Khatoon et al. (2020), which uses capital, risk, profitability, and solvency indicators to compare the profitability and efficiency of inter-digital banks with traditional financial institutions.

Orji et al. (2018) use three metrics, Cost of Financial Intermediation (CIF), Operational Efficiency (EO), and Return on Equity Net (ROE), to compare the four largest US banks with northern fintech businesses listed on stock exchanges. They discover that traditional financial intermediaries are more efficient than fintech. Furthermore, Tonui Kipngeno (2018) reported that commercial banks worldwide have increasingly been using digital banking. In this scenario, the electronic addresses of important public and private corporations and banks, both digital and traditional, are widely available on the Internet, along with financial data and other relevant information. After thorough and well-founded analysis, this data can be generated for stakeholders. As a result, this study considers commercial banks to be relatively new and growing within the national financial industry. They offer a distinct business approach that fits with portfolios of reasonably priced financial products and services, and they mostly conduct business online. Conventional banks, on the other hand, have been in the financial business for decades, if not centuries, and they have physical branches where they sell their services and high-interest products (Archuleta et al., 2013). The study's objective was to investigate the connection between digital banking and the financial performance of commercial banks. The data came from publicly available annual reports of commercial banks (Davis, 1989; Featherman & Pavlou, 2003). The information was collected from the Central Bank's and individual banks' websites. The study collected data on ATM transaction volume to demonstrate ATM banking. The number of e-banking transactions and their value that are documented on internet platforms. The study also used variables related to mobile banking, such as transaction volume (Gomber et al., 2018; Joo & Grable, 2004).

On the other hand, return on assets (ROA) was used to gauge financial performance. The profitability of Quetta's commercial banks is positively correlated

with Internet, mobile, and ATM banking, according to research. However, the regression study demonstrated that ATMs and internet banking had a positive and considerable impact on commercial banks' financial performance. Nonetheless, it has been discovered that Quetta commercial banks' financial performance is considerably and adversely impacted by mobile banking. In light of the results, the study recommends that banks increase their use of digital banking, especially online and ATM banking. According to the report, Quetta's central bank, which serves as the country's primary supervisor and regulator of commercial banks, should establish effective rules to limit the use of digital banking by Quetta's commercial banks.

Problem Statement

Commercial banks are making significant investments in integrating information and communication technology to deliver excellent, customer-friendly service. Improving financial services for customers is the primary driver of commercial bank mergers. However, since the advent of digital banking, several issues have emerged, and banks have difficulty determining how these issues affect their financial performance (Hallunovi & Berdo, 2018; Arfeen & Nielsen, 2017). A variety of commercial banking technologies has also attracted substantial investment from Pakistan and other nations. Among the numerous factors highlighted is the effect of digital banking on the financial performance of Quetta City's commercial banks. In Pakistan, there is a dearth of research on the different ways that digital banking affects financial performance. The study has addressed this topic at the city level and will soon be expanded to the national level to close the research gap on the influence of digital banking on the financial performance of Quetta's commercial banks.

Literature Review

The technical advancement of banks worldwide dates back to the 1960s, when microcomputers enabled the decentralization of information processing that had previously been centralized in bank mainframes (Nkem et al., 2016). In the 1970s, banks enabled the integration of online systems by facilitating national computing, according to Maina & Mungai (2019). The initial ideas for electronic box products and home

banking programs emerged in the 1980s. Banks offered services through savings accounts when the Internet was first used as a banking channel in the 1990s. The initial step toward offering financial services online in the 1990s was internet banking, which gave customers a practical alternative to long hours spent in branches. Ouma & Ndede (2020) note that the Internet and e-commerce business models thrived in the 1990s, supporting the historical record of technology growth in the banking and financial sector. In this sense, a closer relationship between technology and the banking sector has led to new business models based on fully online frameworks. The banks ING and HSBC launched the first fully digital accounts in 2005. Zhang et al. (2018) claim that the 2008 global financial crisis profoundly changed how financial service users thought. The global financial crisis of 2008–2009 was one of the factors that led to the emergence of fintech, according to Said & Kaplelach (2019). Technological developments and a more constrained financial environment, which made banks less competitive due to compliance costs, have both contributed to the recent rise of fintech. Since the 1990s, fintech has expanded dramatically. There are presently approximately 2,500 fintech businesses operating in 62 countries, divided into 16 technological categories, and they have already raised 117.9 billion dollars in capital, according to research by Mohammed (2018) and a poll conducted by Fintech LAB in June 2019.

According to Kiragu (2017), digital technology is transforming conventional businesses and presenting difficulties for the banking sector. According to Kamande's (2018) research, there has been an 8% increase in both bank and mobile transactions. According to this, the percentage increased from 35% in 2017 to 40% in 2018 (Owade, 2018). According to Hallunovi & Berdo (2018), Internet banks are financial institutions that emphasize online services, even if they have physical premises. Digital banks are fintechs, according to OWADE (2018), whose primary purpose is to compete with traditional financial institutions by offering financial market services and products. The digital bank's infrastructure is more adaptable, dynamic, and latency-free, enabling greater real-time consumer interaction (Orji et al., 2018). A business model, according to Maina & Mungai (2019), is defined as

banks that deliver financial products and services mainly through physical infrastructure, such as bank branches.

Dzombo et al. (2017) found empirically that bank performance and firm innovation capability are strongly positively correlated. Using a relative ranking approach, Kiragu (2017) conducted a comprehensive evaluation of commercial banks' financial innovation skills and found that state-owned banks are more capable than commercial banks. To achieve comprehensive innovation through management, organizational, and technological strategies, commercial banks must apply new ideas and concepts, according to Njoroge & Mugambi (2018). On the other hand, Roy (2018) has discussed the impact of financial technology on commercial banks. The term "financial technology," or FinTech, refers to the organic combination of finance and information technology. Transaction settlement, retail banking, wealth management, insurance, loan financing, and payment and settlement are the six financial areas in which it is extensively utilized.

Additionally, Orji et al. (2018) described the expanding impact of the Internet and mobile payments when digital banking was introduced in commercial banks. According to a 2016 study by Nkem et al., published by the Central Bank, online and mobile payments have continued to grow rapidly over the past three years. New Internet-based mobile payment techniques (NFC, scan code, and fingerprint) have greatly improved payment and capital circulation efficiency as compared to conventional bank card payment methods. Furthermore, according to Chipeta & Muthinja's (2018) research, the advent of digital banking has led to increased loan funding. The sharp fall in bank deposits and the quick expansion of third-party payment systems will undoubtedly hurt the loan industry. As a result, commercial banks find it challenging to expand their lending and financing operations, and their earnings have also sharply declined.

Furthermore, tiny and micro enterprises have a strong need for loans, yet commercial banks frequently provide these customers with small loans of less than \$1 million (Alsaad & Almaamari, 2020). The loan credit line and the risk are both significant. Loans are difficult to obtain for small and micro businesses. The

internet lending platform, primarily used for small and microbusiness loans and personal loans, offers a limited line of credit and eliminates the bank's time-consuming approval process.

Methodology

The research philosophy is based on the positivist approach, which interprets theories across a variety of contexts and gathers data through scientific analysis. Since the hypothesis will be established utilizing previous research and theories, the research methodology will be deductive. The deductive technique involves formulating the hypothesis at the beginning of the investigation, drawing on previous studies and theories (Sekaran and Bougie, 2016). To determine the independent and dependent variables, the inquiry is based on quantitative data. The data are numerical and quantitative, and they are validated through statistical analysis. The secondary data source would be the annual reports (2018–2024) of the commercial banks in Quetta City that provide digital banking services. The research sample will comprise five Quetta-based banks that offer digital banking services. The total sample size is 50; purposive sampling was used, with a focus on study-relevant bank data. Statistical testing techniques are applied to analyze the data. The study applied descriptive statistics, regression analysis, and correlation analysis. Regression analysis was used because the data are cross-sectional and time-related. A research design is a tool that shows how research is to be conducted (Labaree, 2013). It is the all-encompassing approach a researcher employs to integrate all facets of the investigation and guarantee the successful resolution of the research topic. It covers methods for gathering, measuring, and analyzing data. This study used a descriptive research design, which collects data without changing it in any manner. It helps answer the who, what, and how questions, but not the why. Because the researcher obtained the data and reported them precisely as they were, without intending to influence the responses, this design was suitable for this study. The group of individuals the researcher wants to include in their study is known as the target population (Asiamah, Mensah & Oteng-Abayie, 2017). The study's target population was all Quetta commercial banks. As of 31 December 2024, SBP Pakistan had 21 commercial banks registered (State

Bank of Pakistan, 2025). The data were extracted from the annual reports of 31 commercial banks. According to their websites, this was collected from the central bank's and the five banks' websites and annual reports. The study gathered information on the number of ATM (debit) cards issued at point-of-sale devices and the number of transactions made at ATMs to illustrate ATM banking. The study collected data on registered bank accounts, the quantity of agent deposits and withdrawals, the number of agents actively using mobile banking, and the total value of these transactions.

On the other hand, data were collected on the volume and total value of transactions conducted via online banking platforms. For the study, information on equity and asset returns was collected to assess financial performance. Finding the connection between e-banking features and financial success measures was the aim of the data study. ATM banking metrics, such as the number of ATMs, ATM debit cards, POS terminals, and ATM transactions, were used to assess e-banking. Data from mobile banking, including the total number of registered mobile money accounts, the number of active agents, and the total amount of money agents cash in or cash out, were also used in the study. Additionally, Internet banking evaluates e-banking activity based on the volume and value of transactions made on online platforms. Furthermore, return on assets (ROA) was used to assess financial success (Arfeen & Nielsen, 2017).

The following model was estimated.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where:

β_1 , β_2 , and β_3 are coefficients

Y = Financial Performance (Measured as ROA)

X_1 = ATM banking, which is measured as transactions through ATM banking

X_2 = Mobile banking, which is measured by the transactions through mobile banking

X_3 = Internet banking (measured as several transactions through online platforms and the value of transactions through online banking platforms). Statistical significance was assessed at the 0.05 level.

Results

Descriptive

Statistics

Table 1 shows the results of the descriptive research

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev
ROA	50	-4.1	4.7	1.79123	2.09876
Transactions through the ATM	50	5045	9847051	1765467	3710976
Banking Transaction through mobile banking	50	1105879	2.27E+08	932432981	8320917
Transaction through online platforms	50	33098	9878764	2598768	2100897
Value of transaction through the online banking platform	50	213987.8	72309876	23498987	19876765

With 98477051 and 5045 transactions, respectively, mobile banking had the most and the fewest ATM transactions. Mobile banking transactions ranged from 1105879 to 226936090. The mean and standard deviation for online banking were 2598768 and 2100897, respectively.

Table 4.2 shows a significant, positive correlation between ATM banking and financial performance

(ROA) ($\rho = 0.588, p = 0.001$). The study found a positive and substantial relationship between mobile banking and ROA ($\rho = 0.707, p = 0.000$). The results show a positive and substantial relationship between Internet banking and ROA ($\rho = 0.752, p = 0.000$).

Table 2 Correlation Matrix

		ATM Banking	Mobile Banking	Internet Banking	ROA
ATM Banking	Pearson Correlation	1			
	Sig. (2-tailed) Pearson				
Mobile Banking	Correlation	.683**	1		
	Sig. (2-tailed) Pearson	0.000			
Internet Banking	Correlation	.692**	1.000**	1	
	Sig. (2-tailed)	0.001	0.000		
		.588**	.707**	.752**	
ROA	Pearson Correlation	0.000	0.000	0.000	1
	Sig. (2-tailed)				

Internet financial transactions improve commercial banks' financial performance metrics, such as bank profits, loan books, operating expenses, and customer deposits, according to Mateka et al. (2016).

The results also supported those of Jepchumba and Simiyu (2019), who found that digital banking had a favorable effect on the financial performance of commercial banks.

Table 3: Model Fitness

	R Square	Adjusted R Square	Std. The error of the Estimate
.765a	0.605	0.551	0.32601

The R-square was 0.605, according to Table 3's findings. It means that ATMs, mobile banking, and internet banking accounted for 60.5

percent of the difference in commercial banks' financial performance in Quetta.

Table 4: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	5.535	3	1.845	17.359	.000b
Residual	3.932	37	0.106		
Total	9.467	40			

The ANOVA findings revealed a p-value of 0.000. This implied that the overall model used to explain the study's phenomenon, the relationship between e-banking and financial performance, was significant

(P=0.000) (Lusardi & Mitchell, 2014; McKnight et al., 2002).

Table 5: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.014	0.426		0.037	0.891
ATM Banking	2.125	0.881	0.69	2.912	0.003
Mobile Banking	-16.529	3.524	-5.911	5.191	0.001
Internet Banking	16.563	4.644	4.695	3.801	0.002

The model coefficients indicated that financial performance and ATM banking were positively and significantly correlated ($\beta = 2.125$, $p = 0.003$). Worku (2016) concurred, stating that the banks' success was directly correlated with the number of automated machines and points of sale. Vekya (2017) found that the number of ATM transactions is precisely equal to the bank's earnings, and the exact proportionality holds for the number of POS transactions and the bank's profitability. These conclusions were similarly in line with Vekya's findings. It was consistent with Ali's (2018) findings, which showed that commissions and fees associated with mobile banking have a detrimental effect on commercial banks' financial performance. However, Mueni (2019) found that mobile banking significantly and favorably affects net profit, return on equity, and return on assets. Internet banking and financial success were positively and significantly correlated ($t=16.563$, $p=0.002$). This is

consistent with Harelimana's (2017) findings, which showed that the online banking system improved the bank's overall performance.

The model was therefore confirmed as $Y = -0.012 + 2.125X_1 + -16.529X_2 + 16.563X_3$

Internet, mobile, and ATM banking accounted for more than 50% of the variance in the financial performance of Quetta's commercial banks, according to the correlation and regression analysis. Additionally, the overall model utilized to describe the study phenomenon, the connection between financial success and e-banking, was significant at $P=0.000$. The study's findings demonstrated that internet banking and ATMs had a positive, substantial relationship with financial success, whereas mobile banking had a significant negative association.

E-banking improves a bank's financial performance by lowering transaction costs, increasing the effectiveness of payment and other financial services, and growing

the bank's clientele. Digital banking fosters a banking culture and reduces cash use by providing services and solutions that expedite the settlement of financial transactions. By enabling customers to access their bank accounts at any time, banking outside of regular business hours, providing a range of products connected to digital banking, enabling customers to access their accounts without physically visiting a branch, and reducing banking costs, e-banking has a positive effect on financial performance (Nicolini et al., 2021; Venkatesh et al., 2003).

The previously reported findings aligned with those of Ogare (2013), who discovered a significant relationship between digital banking and bank performance. Furthermore, Addae-Korankye (2014) asserted that technology has raised consumer attendance and bank profits. According to Okombo (2015), financial institutions benefit from reduced transaction costs in the following ways: customers can access bank services whenever they want, even beyond regular business hours, without having to visit the bank in person. When transaction costs decline, financial institutions' performance improves significantly.

E-banking technologies, such as ATMs, direct payment, electronic check conversion, mobile banking, and phone banking, significantly influence how banks operate (Ngango et al., 2015). These results were consistent with theirs as well. The findings corroborated those of Wafula and Kombe (2015), who found that implementing technology reduces costs, improves quality, and saves time. Additionally, the findings aligned with those of Njoroge and Mugambi (2018), who found that digital banking enables financial institutions to reach a larger population, reduces transaction costs, and improves access to essential services. The findings, however, are at odds with those of Mateka et al. (2016), who found that online financial transactions positively affect the financial performance measures of commercial banks, including bank profitability, loan books, operating expenses, and customer deposits. The findings also ran counter to those of Ali (2018), who asserted that the profitability of commercial banks is significantly impacted by online banking's accessibility, costs, commissions, and risks, and that enhancing online banking's security and privacy while lowering its

associated risks has improved banks' financial performance (Agbeve et al., 2025).

This study sought to determine the effects of e-banking on the financial performance of Quetta commercial banks. Digital banking makes it easier and faster for customers to trade, which boosts bank productivity. However, the connection was poorer than with internet banking. It suggested that a 1 percentage point increase in online banking use would yield the most significant boost to commercial banks' financial performance. Increased use of digital banking will improve the financial performance and asset returns of Quetta's commercial banks. However, ATM banking has the lowest correlation of any digital banking method. According to the data, banks' use of e-banking technologies varied: some reported thousands of transactions across several platforms, while others reported only a few. The study discovered a favorable relationship between ATM banking and performance. Allowing customers to access their bank accounts at any time, banking outside of regular business hours, providing a range of products linked to digital banking, enabling customers to access their accounts without physically visiting a branch, and reducing banking costs are some of the ways e-banking enhances financial performance. The impact of mobile banking, compared with internet banking and ATMs, was found to be negatively and significantly correlated, as determined by regression analysis. E-banking improves a bank's financial performance by lowering transaction costs, increasing the effectiveness of payment and other financial services, and growing the bank's clientele. Digital banking fosters a banking culture and reduces cash use by providing services and solutions that expedite the settlement of financial transactions. A detailed analysis of the effects of ATM, mobile, and Internet banking was conducted (Shahzad et al., 2025; Liang et al., 2025).

Conclusion

If commercial banks used ATMs and online banking more, their financial performance would improve. Nonetheless, the study found that mobile banking appears to have a detrimental impact on commercial banks' financial performance. The study concludes that ATMs and internet banking improve commercial banks' financial performance. Therefore, if more people use mobile banking, financial performance will

decrease. By introducing online and ATM banking, commercial banks will improve their financial performance, draw in more clients, and reduce transaction costs. Enhanced efficacy and efficiency in bank operations will also speed up processes and draw in more customers. The volume of transactions completed through ATMs and online banking raises the return on assets. It implies that commercial banks can declare better financial performance by increasing the use of ATMs and online banking. Cutting transaction costs is crucial because it deters customers from using internet banking and ATMs as often, thereby lowering ROA. The high costs of mobile banking stem from its negative impact on financial performance. Reducing the related costs would resolve this problem, attract customers, and improve financial outcomes (Shahzad et al., 2025; Tong & Yang, 2025).

Compared to banks that do not use modern technology in their financial operations, those that do have a greater return on assets (ROA). Most customers would be motivated to keep doing business with commercial banks if they could do so from the convenience of their homes, offices, or other locations. By doing this rather than moving to the bank's location, they will save time and money. Furthermore, removing the inconveniences caused by long queues in banking halls attracts new customers while retaining existing ones. The quantity of automated point-of-sale devices was directly associated with the banks' performance. Consumers are more inclined to borrow and conserve money when they use digital banking. By bringing more money into the banks and enabling them to lend more, increased savings will boost bank profitability and enhance financial performance. Customers' relationships with banks will improve, and customer satisfaction will rise, as they are excited to use their phones to secure loans they were previously unable to obtain or would have had to wait for. The expansion of banks' clientele will boost their bottom line. Quetta's commercial banks are increasingly using digital banking methods, including Internet, ATM, and mobile banking, which is enhancing their return on assets and financial performance. Digital banking allows customers to transact more swiftly and conveniently, thereby increasing a bank's efficiency and effectiveness. Enhancements to the privacy and security of online

banking, as well as a reduction in associated risks, will also be advantageous.

Recommendations

It is recommended that Quetta's commercial banks adopt digital banking more quickly to maintain their competitiveness amid intensifying competition and a constantly evolving technological landscape. It is anticipated that banks will enhance their online and ATM banking services. They should develop more sophisticated strategies to encourage people to use ATMs and mobile banking. They should also raise the necessary funds to establish it. They should also reduce the cost of mobile banking transactions to attract more customers and increase income. To encourage customers to use online banking, the right strategies should be created. Among these might be transaction costs that are lower than those associated with conventional banking. Banks should also ensure that the procedures and processes for digital banking are simple to increase customer comfort and efficiency. Regardless of any constraints or abilities that would prevent them from using online banking, all consumers will gain from this user-friendly experience. The customer experience can also be enhanced by voice-over services for those who are blind or visually impaired. As a result, the banks will be able to reach a larger market and expand their client base (Chao et al., 2024).

The study concludes that commercial banks should improve the security of their digital banking systems to prevent fraud and hacking, which could deter clients from using this service. They should implement robust security measures to protect their customers' funds, accounts, and personal information. Making courteous calls when fraud or hacking is detected and employing the proper customer verification procedure are two ways to do this. Customers will be happier and more trusting of banks, boosting retention. Retaining customers is one strategy for improving banks' financial performance.

It is recommended that commercial banks continuously update and improve their security systems and conduct in-depth studies of their effectiveness. They must also follow the guidelines set by the government through the Central Bank of Pakistan, their regulator, for resolving consumer complaints. As a result, customers will feel safer and

more trusted. The study also recommends that the Pakistani central bank establish effective rules governing Quetta's use of digital banking, as it is the primary supervisor and regulator of commercial banks. They should ensure that the rules they set promote advancements in internet banking, thereby increasing income. The Central Rail Bank of Pakistan is encouraged to support commercial banks in resolving customer complaints and mitigating the effects of fraud and hacking.

Limitations of the study

This study had several drawbacks. The survey was only completed by commercial banks in Quetta. The findings of this study may therefore not be generalizable to banks in other countries or regions. This is because commercial banks may operate differently across countries and regions. Additionally, various banks may have varying rates of digital banking adoption and customer acceptance. The fees associated with the processes and procedures may also differ.

The study's methodology had drawbacks as well. Because the study could not include all other approaches, the results might not be exhaustive and may draw attention to subjects the methodology was unable to address (Zeelenberg & Pieters, 2007; Joo & Grable, 2004). The investigation's fundamental hypotheses were also limited. The processes under investigation may not be adequately described by Schumpeter's Theory of Innovation, Innovation Diffusion Theory, and a model of technological acceptance. Aspects of digital banking that are not addressed by the theories under consideration may also be highlighted by other theories. Furthermore, as technology advances, the study's conclusions may become outdated, necessitating a new evaluation.

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