Exploring the Relationship between Financial Innovation and Financial Performance: Evidence from Developing Economy

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Abstract

Digital finance is a new field that blends inclusive financial innovation with new models brought about by technological improvements. Due to this, it is now essential for businesses to give competitive and innovative product market competition top priority. Consequently, laws governing the corporate environment and financial digitalization contribute to improving the financial performance of businesses. This study assesses the effect of financial innovation on financial performance. The commercial banks that operate in Peshawar district of Pakistan make up the study's population. A representative proxy for institutional innovation, process innovation, and product innovation is used in the computation of financial innovations. Return on Assets (ROA) is a measure used to evaluate financial performance. The sample of Pakistani commercial banks from 2013 to 2022 is analyzed in this research. In this research, purposive sampling was used. Using that method, the researcher limited the selection of firms to those for whom the data for all years was available. The present research study employs positivism as its research philosophy. For this study, the researcher used a deductive methodology. This study is quantitative in the light of theories and literature. Using panel data, this research used multivariate analysis and several diagnostic tests. The result of the study shows that product innovation and process innovation improve the financial performance of commercial banks operating in Peshawar district of Pakistan. This study provides suggestions for policy maker as well as investors to concentrate on financial innovation because it enhances the financial performance.

1. INTRODUCTION

A new or improved product is being developed by commercial banks, and this innovation lowers the cost of producing the financial services that are now provided (Sinha et al., 2022). Financial innovation is thus reformed because of market players having to find novel methods to increase earnings (Shegai & Jung, 2023). Even though commercial banks have been doing business continuously for the last 20 years, the organization of the profitable and commercial banking industry has experienced significant revolution. According to Mehralian & Khazaee (2023), this transformation is being powered by open domestic legislation, heightened global competitiveness, rapid breakthroughs in new financial instruments, and the quick-tempered advancement of information technology. Thus, innovation is seen in the commercial banking industry as the process of generating and bringing to market new financial instruments, markets, and technological platforms that streamline information access, trade, and payment methods (Almici & Camodeca, 2021).

The financial revolution is upgrading the future via the mechanisms and products of financiers, but client preferences are changing daily; the primary weapon to drive this process is tax policy (Nanda & Bhattacharyya, 2000). Financial innovations, according to Hadiji, (2023), may minimize the cost of conveying information and increase the elasticity between the yielding money balancing greater to lower. Moreover, market participants might benefit from decreased risk and higher returns on investment. Financial innovation has the potential to grow market share, expand the number of institutions, create new payment methods, and seize market funds.

According to Chen and Peng (2019), Institutional innovation, process innovation, and product innovation are the three categories of financial innovation. Sinha et al. 2022 proposed that banking systems are closely linked to institutional innovation, while new business processes that improve the nation's financial advantages' efficiency are referred to as process innovation. Real-time gross settlement (RTGS) and auto teller machines (ATMs) are two examples of this. Product innovation might include products and services offered by operators in response to market demand to enhance their capabilities. Product innovation includes credit cards, personal loads, mobile banking, and money transfers.

Financial performance is the ability of an organization to generate income via the proper use of its assets. Financial performance explains how to integrate an asset with a company's primary business process to generate income. Financial performance is often treated to evaluate firms in

the identical industry or to equal the industry or fields altogether, as well as to reinforce the overall financial health at any moment. Financial performance may be examined in a variety of ways, but each approach must be used in tandem. As a result, cash flow from operating income, operational income and operations, and total sales components can all be practiced, (Shetty et al.,2024).

In contrast to the budget or mixed methodologies, Pham and Quddus (2021) conclude that financial innovation has been used to assess the financial performance of banks and other financial institutions. Agreeing to Rehman et al. (2021), finance and accounting approaches often include Return on Assets (ROA), Net Profit after Taxes, Average Annual Tenancy Rate, and Return on Investment (ROI). This study will be utilized on ROA as a measure of bank financial performance. Kiambati (2020) states that further performance methods include profit, output, growth, equity satisfaction, market acquisition, competitive position, and profit before tax.

As to the State Bank of Pakistan (SBP, 2022), Pakistan has made considerable progress in the previous ten years when it comes to online banking, including several modes like ATM, EFT (electronic funds transfer), and mobile banking. The demand for these services has been steadily increasing, and commercial banks are actively helping their customers access them.

Sinha (2022) claims that banks understand that competition among themselves would match the changes they go through and might improve their financial performance. According to Hadiji's (2023) research, banks would gain from implementing new technologies in their branches in order to foster the expansion of the United States (US) and encourage the acceptance of smaller banks there. According to Trejo's (2018) research, bank performance was little impacted by financial innovations. Due to the contradictory results, more conclusions from a Pakistani viewpoint is commanded to establish how financial innovations affect the financial performance of commercial banks.

A number of developments in the fields of development and banking are covered in the SBP Annual Report (2022), including the introduction of intervention banking, microfinance banks (MFBZ), electric payment and clearance systems, automated home cleaning, ATMs, and mobile money transfer (MMT). The purpose of this study is to ascertain how financial innovations affect Pakistani commercial banks' financial performance. Herhausen (2020) conducted research to investigate how Pakistani commercial banks and two payment systems are affected by sound financial norms. The Automatic Clearance House (ACH) and Real-Time Gross Settlement (RTGS) systems used by the banking sector are mentioned in the book. Research on innovation

and its effects in Pakistani commercial banks is crucial to establishing a link between the bank and technical innovation as well as enhancing investment in the financial performance of the banking industry in Pakistan. Our goal in this analysis is to determine the impact of financial innovation on financial performance of Pakistani commercial banks'. Furthermore, the study examines the connection between the productivity of commercial banking in Pakistan and three different aspects of financial innovations: process innovation, institutional innovation as well as product innovation.

2. LITERATURE REVIEW

2.1 Seminal Theories

Numerous academics have contributed to and presented their work on the financial advances used in the banking and commercial sectors.

2.1.1 Schumpeter Theory of Innovation

Financial innovations are intended to result in a decrease in transaction costs, according to Hicks and Niehans (1983). This theory takes a multifaceted approach to addressing the financial advances. It talks about how financial innovation is approached in order to maximize profit. Both financial innovation and financial services upgrading would profit from it.

2.1.2 Task Technology Fit Theory

According to Goodhue and Thompson (1995), information and communication technology (ICT) is more likely to improve individual performance when the user's talents match the tasks that need to be completed. This paradigm may be used to analyze a variety of systems in a wide range of situations, including e-commerce platforms. It often works in tandem with other outcomes that are connected to information findings.

2.1.3 Financial Inter-mediation Theory

Agreeing to the financial inter-mediation hypothesis, changes in the market are brought about by experts searching for more effective ways to generate larger profits. A shift in the financial situation sets off a search for developments in money that are most likely to be profitable.

2.2 Contributing factor of Commercial Banks Financial Performance

According to Onyshchenko et al. (2023), local values have an impact on how banks operate. These values include lending, lending practices, lending foundations, good assets, good governance, goodwill, liquidity, bank technology, and human resources. Furthermore, those sectors pertain to the industry and go beyond administrative management; they are also regarded as external or economic. These consist of interest rates, growth, GDP growth, banks, and tax

rates. Baig and Yusif (2021). Rather than concentrating on other commercial bank policy initiatives, this research will concentrate on improvement.

2.2.1 Return on Assets (ROA)

An accounting-based approach usually produces useful outcomes when assessing the financial well-interests of a company. This approach facilitates the assessment of a company's financial well-being. The present research used accounting-based techniques, particularly Return on Assets (ROA), to calculate and evaluate financial performance. Companies assess the effectiveness of their asset utilization strategies and project their profitability using the Return on Asset(ROA) ratio as a measure. The return on assets of a business is calculated by dividing its net income by the total value of its assets.

2.2.2 Financial Innovation

According to Chen and Peng (2019), Institutional innovation, process innovation, and product innovation are the three categories of financial innovation. Sinha et al. 2022 proposed that banking systems are closely linked to institutional innovation, while new business processes that improve the nation's financial advantages' efficiency are referred to as process innovation. Real-time gross settlement (RTGS) and auto teller machines (ATMs) are two examples of this. Product innovation might include products and services offered by operators in response to market demand to enhance their capabilities. Product innovation includes credit cards, personal loads, mobile banking, and money transfers.

Several scholars have contended that a robust positive correlation exists connecting financial innovation and the financial prosperity of commercial banks. However, former academics have claimed that the association is insignificant. Both Pham & Quddus (2021) and Hadiji (2023) have noted that there is a positive correlation between financial innovation and financial performance. Studies by Shetty et al. (2024) and Berger et al. (2022) presumed that innovations had a negative effect on performance. This investigation will provide a deeper understanding of the kind and importance of the association between the development of financial affairs and the functioning of business banks in Pakistan.

2.3 Hypothesis Development

The study focused on the advancements of financial institutions, with additional consideration given to other financial aspects of product development for the benefit of readers. The technique used by Faulhaber and Baumol (1988) is characterized by its unique nature. The Faulhaber and Baumol model under examination is a monetary theory model that focuses on goods in non-monetary sectors. Examples of this include the Black-Scholes valuation model used by investors

and the Ramsey pricing model used by regulators. However, this approach primarily focuses on non-financial aspects and so is not further discussed in the proposal.

2.3.1 Institutional Innovation

The study conducted by Berger et al. (2024) has had a significant impact on the field of geographical product writing, specifically in terms of its innovative influence on the traditional central editor's industry. Burger examines the technological advancements used in the financial sector, which in turn impacts the performance of the financial industry. He acknowledges that the integration of creative advancements such as ATMs and online banking, namely the ATM product and the processing of internet banking, has become an integral part of the bank's production and implementation. Banking execution is closely linked to the development of new products. Similarly, Berger observes that progress in the IT sector has boosted productivity and financial gains by reducing costs associated with electronic payments. These explanations pertain to the transition in the financial industry from physical currency to digital currency, as well as the increase in the usage of debit and credit cards by customers. This shift is considered one of the main factors driving the growth and expansion of digital banking.

Camodeca (2021) draws a comparison between banks and the 10th District Reserve Reserve nineteen-one website, specifically focusing on the first quarter of 2000 and the presence of non-site sites. The first gadget was discovered in several locations with a high concentration of educated individuals and individuals between the ages of 18 and 64. Banks also incur enormous expenses and charge high interest rates for business transactions.

H1: The association between institutional innovation and financial performance is positive.

2.3.2 Product Innovation

In 2012, Nyathira performed research to analyze the effects of financial innovations on the commercial banking sector in Kenya. The research especially examined the relationship between two payment systems, Automated Clearance House (ACH) and Real Time Gross Settlement (RTGS), and the profitability of the banking industry. The study she conducted lasted for a period of four years, namely from 2008-2011. This study has shown a clear connection between the two payment methods and post-tax profit (PAT).

According to Sinha (2022), there are certain banks on the internet that provide cost-effective income for the banking industry. However, only a small number of banks are used by a few million internet users in the UK. Grewal (2020) establishes a correlation between the emergence of new advancements and the increase in sales. However, it does not provide any evidence of a connection between the creation of new employment and job growth. Goyal et al. (2021) have shown a significant positive correlation between the ATM deferral value and the linkage with

stock exchanges for small bank accounts. In their study, Yau et al. (2021) examines the effects of ATM surcharges on banks. They find that ATM expenses lead to an increase in market share and value for major banks, while reducing the competitiveness and profitability of small banks.

H2: The relationship between product innovation and financial performance is positive.

2.3.3 Process Innovation

According to Manogna & Mishra (2021), the use of e-banking accounts is on the rise since it presents an opportunity to save expenses and boost income while also mitigating risks. A comparison between Internet-based firms and traditional enterprises reveals that Internet-based enterprises have the advantage of cheaper costs and larger revenue profits in their growth. Chipeta (2018) reviewed internet information during the third quarter of 1999. They provide the possibility of implementing online banking services for the administration of businesses, metropolitan areas, affluent individuals, and large sums of money that do not generate interest. In addition to banks providing online services, the extent of their service offerings was closely linked to the bank's size and the duration of its internet connection provision.

An audit conducted at Brazil's banks reveals the expenses associated with information technology, as well as the expenses and quality of existing commodities, services, or products. The citation "Berger et al., (2022)" refers to a publication by Berger and his colleagues in the year 2022. Peng et al. (2021) introduced technological advancements on a website that offers particular or specialized services while performing research on electronic services. Businessmen have the ability to express their dissatisfaction with a certain product or service in a case, and they may do so via many means such as FAQs, email, live online platforms. The responder is expected to provide timely responses.

Dunne and Kasekende (2018) proved a study on 13 banks in the United States (US) from 1980 to 1996. It was understood that although Telecommunications Communications was very influential in all aspects of hard work, it did not contribute to increased revenue profits. Adnan (2009) performed a study on the influences of technological advancements on the turnover and value of the US budget from 1993 to 2004. The research revealed a strong correlation between the achievement of technological advancements, output, and cost efficiency. According to Peiris (2005), one of the main financial institutions participating in distributing cash for fundraising is Peiris Bank, which provides services such as ATM, telephones, internet, and e-money. Nevertheless, as stated by Aghion et al. (2005), reductions will be lessened when they are publicly deployed. Batiz-Lazo and Woldesenbet (2006) conducted a study on refinanced cash

checks in U.K. banks. They found that there is a distinction between product creation and the process of renewal. This includes the adoption of new creative goods, which have varying effects on the financing of banks. Recent studies aim to diminish the influence of financial reforms on the funding of commercial banks in Pakistan via modern study.

H3: The relationship between process innovation and financial performance is positive.

3. METHODOLOGY.

3.1 Research Design

The research design for this research paper is focused on using descriptive and causal statistics to determine the impact of financial innovation, such as product, process, and organizational innovation on the financial performance of commercial banks. The time frame for this study is from 2013 to 2022. This research utilizes a sample consisting of branch managers and operation managers from all banks in the Peshawar area, including all levels of management including top, medium, and lower levels. The data is assembled from the annual reports of the selected banks.

3.2 Variable explanation

The dependent variable in this research is the financial performance. Return on assets (R0A) is applied to determine financial performance. The return on assets is find out by dividing the net profit by the total assets (Ahmad et al., 2021; Jamal et al., 2021). The independent variable of the study is financial innovation. Financial innovation is determined by the presence of institutional innovation, product innovation, and process innovation, as stated by Hadiji (2023) and Pham & Quddus (2021). The control variables investigated in this are the size of the company and leverage of the firm. The company size is determined by taking the logarithm of the total assets, as shown by Oliviero et al. (2024), Thomas (2012), and Xue et al. (2023). The calculation of leverage involves dividing total debts by total assets (Oliviero et al., 2024; Gerged, 2020; Xue et al., 2023).

3.3 Research Model

In the present study, a multivariate analysis is conducted to inspect the linear association between financial innovation and financial performance.

$$ROA=\alpha+\beta_1 INS+\beta_2 PRD+\beta_3 PRS+\beta_4 FSIZ+\beta_5 LEV+\varepsilon_{i,t}$$

$$(3.1)$$

The association between the dependent variable and the independent variable is represented by the equation (3.1). The ROA measures the financial performance of commercial banks, the INS measures the institutional innovation, the PRD measures the product innovation, the PRS

measures the process innovation, the FSIZ measures the size of the bank and the LEV measures the leverage. The slope, denoted by β, is the beta coefficient, and the error term is denoted by εi,t.

4. DATA ANALYSIS

4.1 Descriptive Statistic

Descriptive statistics provide a concise overview of the data. The Table I presents the descriptive statistic used to estimate the influence of financial innovation on financial performance.

Table I Descriptive Summary for financial performance

Variable	N	Mean	Std. dev.	Min	Max
ROA	310	4.08	.576	3	6
INS	310	3.726	.36	2.648	4.783
PRD	310	3.542	.45	2.746	4.749
PRS	310	3.758	.413	3.264	4.765
FSIZ	310	22.17	13.53	6.79	3.524
LEV	310	.76	.586	.003	1.753

This Table displays the descriptive statistics of Financial Performance for banks of Pakistan. Financial performance is analyzed by ROA (returns on Assets). INS is used for institutional innovation; PDR is used for product innovation and PRS is used for process innovation. FSIZE is for firm size, LEV is for leverage. These are the control variable.

4.2 Correlation Matrix

This study examines the collinearity across variables by using a correlation matrix. The correlation matrix for financial success is shown in Table II. The correlations between all variables are lower than the 70% criterion (Greene & Hensher, 2003; Gujarati & Porter, 2010; Jamal et al., 2023). Thus, the data does not exhibit heteroskedasticity, allowing the researcher to use it for future analysis.

Table II Correlation Matrix for Financial Performance (ROA)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) ROA	1.000					
(2) INS	0.427***	1.000				
(3) PRD	0.747***	0.524***	1.000			
(4) PRS	0.034	0.068	-0.061	1.000		
(5) FSIZ	0.423***	0.415	0.453	0.473	1.000	
(6) LEV	0.047	0.547	0.547***	0.24**	0.245**	1.000

The Pearson correlation coefficients between variables and their corresponding significance levels are illustrated in this table. Financial performance is calculated by ROA (returns on Assets). INS is used for institutional innovation, PDR is used for product innovation and PRS is used for process innovation. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

.4.3 Ordinary Least Square (OLS) to describe ROA

0rdinary least squares (0LS) model, also known as the linear least squares model, is a technique utilized to assess unidentified values in a linear regression model. The goal is to reduce the sum of squared differences between the observed responses (values of the variable being predicted) in a dataset and the predicted responses, which are calculated using a linear function of a set of explanatory variables.

Table III Regression Analysis for ROA

ROA	Coef.	St.Err.	p-value
INS	.054	.085	.375
PRD	.875**	.075	0.000
PRS	.126**	.071	.013
FSIZ	-.312***	.026	0.000
LEV	-.038**	.019	.041
Constant	.848*	.441	.0737
R-square	0.542	No. of obs	310
F-test	75.945	P > F	0.000***

This table presents the regression analysis for ROA., **, *** represents statistically significant at 10%,5% and 1% respectively.*

4.4 Results and Discussions

Table III displays the regression model representing the financial performance. The R-squared and F-value metrics are used to assess the adequacy of the model. The value of the R2 coefficient is 0.542. This statistic represents the coefficient of determination, indicating that the independent variable may account for 54% of the variability seen in financial performance, specifically Return on Assets (ROA). The F-value is 7% and may be used for further investigation.

According to the study's results, financial innovation enhances the financial performance of banks operating in the Peshawar area. The present analysis demonstrates the lack of a substantial relation between institutional/organizational innovation and the financial performance of commercial banks in Pakistan. Furthermore, the findings also indicate a positive and significant relation between product innovation and the financial performance of banks in Pakistan. The relation is statistically significant since the p-value of 0.000 is lower than the significance threshold of 0.050. The research ultimately demonstrated a positive and significant relation between process innovation and the financial performance of banks in Pakistan. Both Hadiji

(2023) and Pham & Quddus (2021) have shown the positive relation between financial innovation and financial performance. The studies accomplished by Berger et al. (2022) and Shetty et al. (2024) have proved the consensus that innovations have a detrimental impact on performance. There is a significant association between the size of a firm and its leverage with respect to return on assets (ROA). Li et al. (2018) and Mohammad & Wasiuzzaman (2021) have shown that there is a optimistic association between the size of a firm and its financial success. The leverage enhances the financial position of the firm. Jamal et al. (2022) also corroborated the same findings. Based on the regression findings, hypotheses H2 and H3 have been accepted.

5. Conclusion

The foremost aim of this study is to establish the relation between financial innovations and financial performance. Most of research papers have examined the relation between financial innovation and financial success in both developed and developing economies. Greater attention should be directed towards the development of emerging nations such as Pakistan. The primary objective of this research is to examine the relationship between financial innovation and the financial performance of commercial banks operating in the Peshawar area of Pakistan. Financial innovation is measured using three indicators: institutional innovation, process innovation, and product innovation. Financial performance evaluation involves the assessment of accounting-based metrics, such as return on assets (R0A) (Yu et al., 2018; Pintae et al., 2014). The sample for this research consists of commercial banks that have been functioning in the Peshawar district of Pakistan from 2013 to 2022. The research used the purposive sampling approach. Employing that methodology, the researcher chooses firms that had data accessible for every single year.

 This study inquiry is driven by the philosophical framework of positivism. A deductive research methodology involves the methodical examination and verification of a hypothesis. This study uses quantitative methodologies to assess the extensive literature review and analysis. Quantitative approaches allow for the systematic measurement of variables and the testing of hypotheses. This research included a variety of diagnostic tests and conducted multivariate analysis to examine panel data. The study's results suggest that both product innovation and process innovation have a favorable influence on the financial performance of commercial banks in Peshawar district of Pakistan. The present research demonstrates a direct relation between financial performance and the financial innovations, such as product, process, and organizational innovation, within the commercial banking industry of Pakistan. This study demonstrates that financial innovation allows financial institutions, specifically banks, to renovate the ATM from a

mere cash dispenser into a client association supervision tool. This transformation helps the banking sector enhance customer loyalty, particularly among those customers who primarily rely on the ATM for their banking needs. The research finds that the adoption of ATM technology and the introduction of innovative products, processes, and organizational practices have a beneficial effect on the financial performance of commercial banks in Pakistan.

5.1 Contribution of the Study

This research successfully addressed the controversial issues that were previously raised in past investigations, while also examining Pakistan as a burgeoning economy. Additionally, it provides significant perspectives on the potential influence of financial innovation on the financial outcomes of commercial banks in emerging countries. A study was conducted in Pakistan to analyze the effects of financial innovation and other organizational factors. The current study aims to fill a gap in the existing information about Pakistan's categorization as a developing country.

5.2 Policy Implications

The study's conclusions have significant implications for several stakeholders, including as financial institutions, current and prospective owners, and customers in the United States and abroad, management, and policymakers. This information is also valuable for individuals worldwide and within their local communities who may find these variables advantageous. This research facilitates the assessment of the cost-effectiveness of investing in novel technologies for owners and investors. The findings of this research are also beneficial for legislators and executives. They monitor their actions and effectively allocate their resources. Ultimately, their financial prosperity will improve. Given the dynamic nature of the business world, it is crucial for firms to be aware of their growth rate as it provides them with valuable insights that can be used to successfully strategize and compete.

The study's conclusions may be used in both developing and emerging nations. Stock exchanges and other regulatory agencies should provide explicit rules and procedures for the approval and registration of bonds. This will enhance tactical execution by improving the clarity of the report content and formats.

5.3 Limitation of the Study

Although the current work has made a noteworthy contribution, it is imperative to acknowledge its many limitations, which might provide valuable insights for future scholars.

This assessment is carried out in emerging countries, namely Pakistan. Additionally, this research investigates financial institutions.

Furthermore, due to time constraints, data is gathered from a grand total of 31 banks for the purpose of this study.

Additional limitation of the research is that it only used data from the prior 10 years period.

5.4 Future Research Recommendations

Subsequent research might include including a more extensive array of macroeconomic factors for examination. This will help clarify the influence of intricate components of macroeconomic factors on financial innovation. Further investigation is needed to explore the correlation between macroeconomic factors and the variables that mediate and intervene in this connection.

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