Arab American University

Faculty of Graduate Studies

Department of Administrative and Financial Sciences

Master Program in Accounting and Auditing

The Impact of FinTech on the Profitability of the Banking Sector in Palestine

Shatha Abdullah Mohammed Ladadweh
202216659

Supervision Committee:

Dr. Rasha Tawfiq Yousef Abbadi

Dr. Mohammad Tawfiq Hasan Abusharbeh

Dr. Sharif Musbah Naser Abukarsh

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This thesis was defended successfully on 1.7.2025 and approved by:

Thesis Committee Members:

	Name	Title	Signature
1-	Dr. Rasha Tawfiq Yousef Abbadi	Main Supervisor	
2-	Dr. Mohammad Tawfiq Hasan Abusharbeh	Member of Supervision Committee	
3-	Dr. Sharif Musbah Naser Abukarsh	Member of Supervision Committee	

Palestine, 7/2025

Declaration

I declare that, except where explicit reference is made to the contribution of others, this thesis is substantially my own work and has not been submitted for any other degree at the Arab American University or any other institution.

Student Name: Shatha Abdullah Mohammed Ladadweh

Student ID: 202216659

Signature:. 

Date of Submitting the Final Version of the Thesis: 9/7/2025

Dedication

Achievements, no matter how great, remain small in the eyes of those who believe that the possible is limitless. The ceiling of the potential is always astonishing, and every person on this earth must have something to offer their nation and society that will advance them, and they will advance them. If a dedication to this effort is necessary, it should be made to all those who have contributed, without singling out any individual.

To everyone who taught us how to write, to those whose efforts we stand here today, since we first learned to pronounce our first letters, since our first steps, our laughter and tears, our stumbles and successes.

To everyone who left their mark and passed on, offering advice or a lesson that strengthened us to move forward with confident steps.

To everyone who enabled us to walk this path, believing that knowledge is the legacy of prophethood, with which we build a nation yearning for enlightenment and relief. By adhering to the path of knowledge and excellence, we offer the least we can do.

And to those who have contributed to this message, supervisors and teachers, we will never forget your guidance, your follow-up, and your eagerness to facilitate all paths in our path.

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The Impact of FinTech on the Profitability of the Banking Sector in Palestine

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Abstract

Purpose: The purpose of this study is to report the results of examining the relationship between financial technology and the profitability of the banking sector in Palestine. Design/Methodology: The study relied on secondary data from the annual reports of banks operating in Palestine and publications of the Palestine Monetary Authority from 2016 to 2023. The study variables were identified as follows: The dependent variable is the bank's profitability, which will be expressed using the return on assets index, and the independent variable is financial technology, which will be described using four sub-indicators: the number of banks' ATMs, the presence of banking services, points of sale, and the use of blockchain technology. BS was used as a control variable, and to analyze the relationship between the variables, the SPSS program was used. Results: The study found a statistically significant relationship between the ATMs and the profitability of banks operating in Palestine. In contrast, POS, IB, blockchain technology, and BS did not show any statistically significant effect on profitability during the study period. The study provided recommendations for legislative institutions and researchers.

Keywords: Financial Technology, Automated Teller Machine, Points of Sale, Internet Banking, Blockchain.

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List of Definitions of Abbreviations

Abbreviations	Title
AIB	Arab Islamic Bank
ATM	Automated Teller Machine
BOP	Bank of Palestine
BS	Bank Size
FinTech	Financial Technology
IB	Internet Banking
PIB	Palestine Investment Bank
PIB	Palestine Islamic Bank
PMA	Palestinian Monetary Authority
POS	Points Of Sale
QUDS	Quds Bank
ROA	Return On Asset
SAFA	Safa Bank
SPSS	Statistical Package for the Social Sciences
TNB	The National Bank

1 .Chapter one: Introduction

1.1 Overview

Technology has become an essential part of modern life, influencing various sectors, including education, healthcare, and industry. Over the past few decades, rapid advancements in digital technology have revolutionized communication, commerce, and financial transactions, significantly improving efficiency and accessibility (Wang & Choi, 2019).

One of the most transformative changes brought about by technology is in the financial sector. Traditionally, financial transactions relied on physical exchanges of money and goods. However, with the rise of digital systems, financial services have evolved to include P, mobile banking, and blockchain technology (Puschmann, 2017). This shift has given birth to what is now known as financial technology (FinTech).

FinTech refers to the integration of financial services with innovative technologies, enabling banks and financial institutions to offer faster, more secure, and more accessible services (Dorfleitner, 2017). The banking sector, in particular, has undergone a significant transformation, with FinTech solutions making financial services more flexible and responsive to customer needs (Thakor, 2020).

In Palestine, the adoption of digital banking services has played a crucial role in enhancing financial inclusion, particularly in rural and remote areas. The Palestinian Monetary Authority (PMA) has actively encouraged the development of financial technologies to expand banking services, promote economic growth, and improve financial accessibility. As electronic banking services become increasingly popular, banks must continuously adapt to evolving customer preferences and technological advancements to remain competitive (Murinde, Rizopoulos, & Zachariadis, 2022).

1.2 Research Problem

The Palestinian economy suffers from the ongoing repercussions of the Israeli occupation and is subject to severe restrictions that limit its movement and development (Al-Jamal and Al-Shaarawy, 2022). Volatile Israeli policies, such as the blockade, checkpoints, and recurrent military operations, have led to a deterioration in the economic situation and high rates of unemployment and poverty. Furthermore, political instability and volatile security conditions create an unfavorable environment for investment and the development of various economic sectors (Qabha and Shobaki, 2024). This situation directly impacts the lives of Palestinian citizens, who face significant difficulties in securing their basic needs.

In recent years, a new generation of FinTech startups has emerged, supporting financial institutions and digital solution providers. This has led to a shift in global financial markets toward leveraging technological innovations in banking operations. The banking sector typically relies on efficient service delivery, and there is a constant need for diverse services to accelerate this process (Shovel, 2016).

In this context, the PMA has launched a series of initiatives aimed at strengthening the financial technology sector in Palestine and developing innovative solutions, such as expanding the use of point-of-sale (POS) systems, automated teller machines (ATMs), Internet banking (IB), and blockchain. These solutions contribute to meeting the needs of various segments of society and facilitate banking transactions for residents in areas most affected by the Israeli occupation. These areas are difficult to provide traditional financial services in, which necessitates advanced digital alternatives that keep pace with global developments.

Through my three years of practical experience in the Compliance Department at the Arab Islamic Bank, I observed firsthand the growing interest of financial institutions in financial technology. This was evident in the numerous instructions and circulars issued by the PMA, in addition to the ongoing meetings held within the bank to keep pace with this trend and implement it in line with modern regulatory instructions and supervisory standards.

FinTech is not just a passing trend but rather the future of the banking sector, so the problem of the study is to identify the impact of financial technology on the profitability of the banking sector in Palestine. This problem can be crystallized in the following main question:

What is the impact of financial technology on the profitability of the banking sector in Palestine?

The following questions branch out from it:

1. What is the impact of ATMs on Return on Assets?
2. What is the impact of POS on Return on Assets?
3. What is the impact of IB on Return on Assets?
4. What is the impact of blockchain on Return on Assets?
5. What is the impact of BS on Return on Assets?

1.3 Significance and Justifications of the study

FinTech is constantly witnessing rapid developments, so this study has made a valuable contribution to understanding the latest trends and challenges in this field because FinTech affects not only banks but also the economy and society as a whole. Therefore, understanding this impact helps in making better economic and strategic decisions.

This study will provide users interested in such a study with more clarity about the relationship between FinTech and profitability. For example, this study will help commercial and Islamic banks and financial institutions understand whether the adoption of FinTech, such as ATMs and IB improves profitability.

The Palestine Monetary Authority, as the regulatory body overseeing financial stability in Palestine, can use this study to shape policies that promote FinTech adoption while ensuring profitability and financial inclusion.

In the context of government and economic policymakers, such as the Ministry of Finance and Planning, the study can be used to integrate FinTech into national financial strategies.

Also, the study will help service providers in the field of FinTech understand how their technologies contribute to the profitability of banks and where they should focus on innovation. Since mobile banking depends on Internet connectivity, telecommunications service providers may benefit from insights into trends in digital banking services.

The lack of studies related to FinTech in many countries, including Palestine, reflects the existence of a large knowledge gap about its impact on the banking sector, so this study will enrich Arab libraries with studies on FinTech, add empirical evidence to the very limited conceptual visions about this relationship in the Palestinian context, and open the door for other researchers to research this topic in depth, as many previous studies lack sufficient justification to support their results.

1.4 Objectives of the study

The main objective of this study is to assess the influence of FinTech on the profitability of the banking sector in Palestine for the period between 2016 and 2023. To be specific, the study aims to:

1. Examine the impact of ATMs on ROA.
2. Examine the impact of POS on ROA.
3. Examine the impact of IB on ROA.
4. Examine the impact of blockchain on ROA.
5. Examine the impact of BS on ROA.

1.5 Hypotheses of the study

H_1: There is a statistically significant impact of ATMs on ROA.
H_2: There is a statistically significant impact of POS on ROA.
H_3: There is a statistically significant impact of IB on ROA.
H_4: There is a statistically significant impact of blockchain on ROA.
H_5: There is a statistically significant impact of BS on ROA.

1.6 Limitations of the Study

The study suffers from limitations that indicate the need for further studies and should be taken into account when analyzing and interpreting the results.

In terms of spatial scope, the study is limited to banks operating within Palestine only, which limits the possibility of generalizing the results to other geographical areas with different economic and regulatory conditions.

In terms of time, the study covers a specific period (2016-2023), which may not reflect future developments in the fintech and banking sectors and may exclude the impact of some technologies that appeared before 2016 or will appear after 2023.

On the subject level, the study adopts a limited definition of fintech that is limited to points of sale, cards, ATMs, and banking applications, excluding other important aspects, which may affect the comprehensiveness of the study and its ability to reflect the full impact of fintech. The study also relies on return on assets as the sole measure of profitability, while using other indicators such as return on equity and net profit margin would have provided a more complete picture of banks' financial performance. In addition, the controlling variable is limited to the size of the bank. Still, some variables may have a greater impact, such as customer and employee culture or resistance to change, and adding these variables would increase the complexity of the statistical model, which may make it difficult to interpret and evaluate. Despite the importance of these variables, the limited data available prevented their inclusion in this study, but these variables deserve study in future research.

Procedurally, this study is primarily based on a quantitative approach using secondary. also, the study is limited to the period from 2016 to 2023 and focuses on data available from banks' official websites and formal responses. Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS).

It is worth noting that this study did not rely on a fixed effects model in the analysis. Rather multiple linear regression was used to measure the impact of each financial technology indicator on bank profitability.

1.7 Terms and Concepts

Financial Technology (FinTech): FinTech refers to the integration of financial services with innovative technologies, enabling banks and financial institutions to offer faster, more secure, and more accessible services (Dorfleitner, 2017).

Automated Teller Machines (ATMs): Are electronic devices that allow customers to access their accounts and conduct self-service financial transactions, such as withdrawing cash, depositing money, and checking the balance, so that these transactions are conducted in public places without the need for bank employees, as confirmed by the study of Jegede (2014).

Internet Banking (IB): These smartphone programs allow customers to manage their bank accounts, pay bills, transfer money, and conduct other financial transactions easily and securely (Shaikh & Karjaluoto, 2015).

Point of Sale (POS): A non-cash payment method where consumers use credit or debit cards in the purchase process instead of carrying cash. POS refers to the point at which the customer pays the merchant for goods or services (Solms, 2015). Small business owners in flea markets and trade fairs use POS devices to give customers a safe alternative to cash purchases.

Blockchain Technology: A distributed database that records financial transactions in an encrypted and secure manner. It enables a community of users to record transactions in a shared ledger within that community so that no transaction can be changed once it is published under the normal operation of the blockchain network (Michael, Cohn, & Butcher, 2018). In this study, blockchain technology was expressed through the "Bank Account Inquiry System", Through this system, a comprehensive, unified, and daily updated database is provided to the Monetary Authority regarding customers' bank accounts. The system provides this data to banks and specialized lending institutions across the banking network.

Return on Assets (ROA): A measure that expresses the bank's ability to generate profits from its assets. It is calculated by dividing net income by total assets (Chhaidar, Abdelhedi, & Abdelkafi, 2023).

Bank Size (BS): According to Köhler (2015), retail banks fund their activities with customer deposits, so the study took BS as a controlling variable and measured it through "customer deposits".

2. Chapter Two: Literature Review

2.1 Related Theories

The global financial sector has undergone a major transformation, driven by rapid developments in FinTech. These digital innovations have dramatically changed the way financial institutions operate and how individuals and companies manage their money.

To understand the theoretical framework that explains the impact of these innovations on the profitability of the banking sector, the role of economic and managerial theories emerges, which help us analyze how banks interact with this new technology and how this ultimately affects their financial performance.

In this context, the study relies on three main theories that provide a theoretical basis for understanding the relationship between FinTech and the banking sector, namely:

2.1.1 Solow Paradox

It suggests that the productivity impacts of new technology can only be seen after a long delay (Triplett,1999). This paradox means that despite investing in financial technology for mobile banking or blockchain, its impact on ROA may not be immediate or directly apparent. This may be because financial institutions need time to absorb and maximize the benefits of new technologies. Or there may be regulatory barriers or high adaptation costs that prevent the desired benefits from being realized quickly.

2.1.2 Endogenous Growth Theory

The study is also based on the endogenous growth theory, which refers to the role of innovation and technology in enhancing productivity and economic growth. This theory means that economic growth comes from innovation, technology, and investment in human capital, not only from external factors such as natural resources (Shaw, 1992). This theory supports the idea that financial technology is not just a tool but a fundamental driver of

economic growth. If banks develop their digital systems and increase their investments in innovation, this leads to improved financial performance and increased ROA.

2.1.3 Diffusion of Innovation Theory

Explains how technology and innovations diffuse within societies and organizations in stages. The process begins when people adopt a new philosophy, idea, practice, or product. Kaminski (2011) asserted that often an initial small number are open to a new idea and embrace its use. After these early adopters spread the idea, a larger number of people followed, creating a critical mass.

This theory explains how banks and customers adopt new digital financial services. If a bank offers an IB or POS service, it may initially face slow adoption, but with time and increased trust, the service will spread among customers, contributing to increased revenues and reduced operational costs.

2.2 Previous studies

The relationship between technology and bank profitability has attracted the attention of many researchers worldwide. Several studies have been conducted in Asia, such as Lv, Du, and Liu (2022) titled "How FinTech Firms Affect Bank Profitability." This empirical study employed an error correction model (ECM). It combined it with Granger causality testing, using data collected through the annual reports of the Industrial and Commercial Bank of China (ICBC) from 2011 to 2020. The banks' return on equity (ROE) was chosen as the dependent variable, and the weighted average regional comprehensive digital finance index (FTI) was chosen as the fintech indicator. Additionally, they introduced four variables that influence bank profitability: the net interest margin (NIM), the natural logarithm of total bank assets (LNTA), the cost-to-income ratio (CTI), and the non-performing loan ratio (NPL). The Ng-Perron approach was applied to verify the stationarity of the variables and prevent "spurious regression." The study concluded that the profitability of U-type banks will be affected by fintech companies. Initially, banks' profits will decline as a result of investing large sums in scientific research or introducing patented technology. They will then enjoy

greater advantages due to the lower input costs provided by fintech companies, and their profits will improve through the in-depth application of the technology

In the same vein, Chen (2020) aimed to examine the extent to which Chinese banks' profitability is affected by the growth of FinTech and to explain the impact of FinTech on bank profitability. An event study was used to conduct the test, and profitability was measured using financial ratios, namely earnings per share, return on equity, and return on assets. Data from 2012–2017 were based on 20 state-owned banks with the highest total assets that offered FinTech services, including WeBank and MYBank, which represent online-only banks. The methodology used is a descriptive-quantitative approach by conducting various tests. To explain the relationship between these variables, multiple linear regression tests were used. Various tests were conducted to determine whether banks' profitability was disrupted by the FinTech phenomenon. Quantitative analysis was conducted by examining relevant issues. The study not only uses regression to estimate the performance of traditional and online banks, but also uses distributed data analysis to assess efficiency. The analysis included three inputs: number of employees, bank size, and total assets. Regarding deposits, they were an output in the production phase, while they became an intermediate element used as an input in the capital conversion phase. The analysis included four outputs: loans, net interest income, commission income, and net profit before tax. The study concluded that the innovations witnessed by the banking sector through the fintech phenomenon represent an opportunity to develop fintech services and increase bank profitability, rather than a distraction.

Wu and Yuan (2021) aimed to statistically investigate the factors affecting six profitable state-owned commercial banks in China, including fintech. A panel data estimation model was used from 2014 to 2019. Data were collected from the Wind and iFinD databases. The study adopted return on equity as a measure of bank profitability. The availability of data facilitated the creation of the Financial Times Index using principal components analysis, which collectively included the number of online finance users, cloud computing market size, and foreign payments volume. Regression results from the model using random effects, fixed effects, and ordinary least squares showed that asset businesses, liquidity businesses, and

brokerage businesses are negatively affected by fintech disruptions to their banking services. Empirically, the results demonstrate that the profitability of state-owned commercial banks is harmed by the development of fintech.

Regarding Islamic banks in Indonesia, Monica, Azam, and Tijo (2021) aimed to investigate the factors influencing the profitability of Islamic banks regarding the slowdown in asset, deposit, and financing growth. Profitability was measured using return on assets (ROA), with internal performance, macroeconomic factors, and FinTech development as the independent variables. This study used panel data analysis, and the sample consisted of ten Shariah-compliant commercial banks from 2017 to 2019. A descriptive approach was used in data processing and analysis to interpret data regression to test the effect of each variable. The results showed that FinTech development positively affects the return on assets of private Islamic banks and negatively affects the return on assets of public Islamic banks.

European research has also placed considerable emphasis on assessing how digital transformation influences the profitability of banks. In this context, Shahidar, Abdelhadi, and Abdelkafi (2023) conducted a study analyzing the dynamic link between financial performance and fintech-related investments. Their research also examined whether the size of a bank plays a role in this relationship. Utilizing the Fully Modified Ordinary Least Squares (FMOLS) method, they analyzed data from 23 European banks spanning the years 2010 to 2019. This timeframe was chosen due to its relevance to recent technological advancements, particularly the rise of artificial intelligence and blockchain technologies, which significantly marked that period. The selection of the European banking sector was justified by the substantial investments allocated to digital transformation initiatives. Data for the study were drawn from multiple sources, including the World Bank, Datastream, and the banks' annual reports. Bank profitability, represented by the return on assets (ROA), served as the dependent variable, while the primary independent variable was the level of fintech investment. To assess digital engagement, the DIG score developed by Kriebel and Diebner (2019) was employed. This metric quantifies digital transformation activity based on the frequency of related terminology found in annual reports. The study also incorporated several control variables, such as bank size (measured through the logarithm of total assets),

capital adequacy (CAR), credit risk (NPL), liquidity (LIQ), and solvency (SOLV). The findings revealed a positive association between fintech investment and bank profitability, with larger institutions appearing to benefit more from these digital investments, suggesting a moderating role of bank size in this relationship.

Dasilas and Karanović (2023) explored how fintech influences the profitability of banks operating in the United Kingdom. Covering the years from 2010 to 2019, the study employed both static and dynamic regression techniques to evaluate this relationship. The research sample included all banks in the UK, whether listed or unlisted, over the stated period. Bank performance was assessed using indicators such as the net interest margin (NIM) and return on assets (ROA). The analysis incorporated several internal bank variables, including total assets (SIZE), cost-to-income ratio (CTI), capital ratio (CAP), loan loss provisions (LLP), interest income share (IIS), deposit growth rate (DG), and cost of funding (FC), alongside two external macroeconomic indicators: GDP growth and inflation (INF). Data for bank-specific variables were sourced from Orbis, while macroeconomic data came from the Global Financial Database. The findings pointed to a positive association between fintech market entry and bank performance, showing that each new fintech firm in the UK market led to increases of 6.385% in NIM and 3.192% in ROA compared to the sample averages

In the Middle East, fintech has also drawn academic and practical interest. A notable study by Dwivedi, Al-Abdouli, and Dwivedi (2021) investigated its effects on the banking sector's efficiency in the United Arab Emirates. The study engaged 76 banking professionals and decision-makers based in Dubai. Drawing from both a comprehensive literature review and expert feedback, the researchers developed and pre-tested a structured questionnaire to ensure clarity and relevance. Responses were collected through SurveyMonkey, and the analysis was conducted using Minitab 19.0 and SmartPLS software. The findings revealed that fintech contributes significantly to enhancing both the competitiveness and operational performance of banks in the UAE

Farhoud (2024) conducted a comparative study to explore the determinants of bank profitability across three regions: Palestine, Jordan, and the Gulf states. The research spanned

the years 2015 to 2022 and employed the System Generalized Method of Moments (System GMM) approach for empirical analysis. The study concentrated on the link between fintech adoption and bank profitability, aiming to determine whether embracing fintech tools enhances or undermines financial performance. The sample comprised 55 banks operating across the targeted regions. Initial results suggested a robust correlation between fintech indicators and bank performance in the Gulf Cooperation Council (GCC) countries, as well as significant positive relationships in Jordan and Palestine. However, the strength and consistency of this relationship varied across the three regions, indicating contextual differences in how fintech impacts bank profitability.

2.2.1 New vision

Chen (2020) and Wu and Yuan (2021) focused on five-year periods, while Monika, Azam, and Teguh (2021) limited their analysis to just three years. However, given the ongoing evolution of financial institutions, the rapid growth of local banks, and the increasing emergence of small and medium-sized banking entities, a longer study period is warranted. Accordingly, the current study adopts an 8years timeframe, aligning with the approach taken by Lv, Du, and Liu (2022), to provide a more comprehensive understanding of the fintech–profitability relationship over time.

The studies of Dasilas and Karanović (2023), Lv, Du, and Liu (2022), and DwiveAlabdooli, Ooli, and Dwivedi (2021) only included the national level, so regional differences were also not included. Adding regional factors may lead to different conclusions as fintech companies develop differently across regions. Future research should focus on how fintech companies impact bank profitability in different countries.

Most previous studies used data up to 2019, which means that there is a gap in research on developments that occurred after that date, including the potential impacts of COVID-19 pandemic, new technological changes, and political and economic developments. Therefore, this study will be distinguished by examining the relationship between bank profitability and FinTech based on data from 2016 to 2023.

While previous studies focused on analyzing the impact of FinTech in general, this study will provide a more detailed and in-depth analysis by focusing on cards, ATMs, banking applications, and blockchain. These four variables are an integral part of people's daily lives, which will increase the study's importance and impact.

Despite the growing interest in the role of FinTech in promoting financial inclusion and economic development, most previous studies have focused on developed or developing countries that enjoy relative political and economic stability. This study aims to fill this research gap by studying the case of Palestine, where the financial sector faces unique challenges due to the Israeli occupation and the blockade imposed on it.

Existing studies on the impact of FinTech on bank performance show a significant lack of coverage of the Palestinian context. Most research focuses on developed and emerging markets, leaving a knowledge gap regarding the impact of FinTech in the Palestinian context. Moreover, previous studies do not address in detail the impact of specific FinTech elements, such as ATMs, POS, banking applications, and blockchain technology, on bank profitability. This study seeks to address this shortcoming by analyzing data from banks operating in Palestine during the period 2016-2023 and presenting an analytical model that illustrates the relationship between FinTech and bank profitability, thus contributing to expanding knowledge in this field.

2.3 Hypotheses Development

ATMs: have been a focal point in the discourse surrounding technological innovation in the banking sector. A number of researchers have investigated their impact on bank performance, though the findings have not always been consistent. For instance, Sujoud and Hashem (2017) reported that ATM innovations had a statistically significant positive effect on both profitability and return on assets (ROA) in Lebanese commercial banks. Similarly, Obamuyi et al. (2023) studied the influence of financial innovation on the performance of Nigerian commercial banks over medium- and long-term horizons. Their results indicated that ATMs were a key driver of performance in the medium term, whereas mobile banking emerged as more influential in the long term. In contrast, Ogbuji et al. (2012) highlighted

some adverse outcomes of ATM adoption in Nigeria, noting a rise in fraud cases and an observable effect on user spending patterns. Furthermore, Nkem and Akujinma (2017) argued that financial innovation, including ATMs, did not significantly affect the efficiency ratio of deposit banks in Nigeria. Rather, they found that it was the existing efficiency levels that guided investment decisions related to ATM infrastructure

According to the discussion about the impact of ATMs on the performance of banks, the hypothesis to be tested is:

- **H_1: There is a statistically significant impact of ATMs on ROA.**

POS: Aliabadi, Gheysari, and Ahmadian (2016) showed that the impact of POS on the return on assets of banks is higher than the impact of ATMs, where the impact of ATMs is less. Nkem and Akujinma (2017) concluded that the efficiency ratio determines the extent of diffusion of information technology and banking communication products in Nigeria. Contrary to the above, Obeid (2023) did not find any evidence of significant effects of ATM distribution and bank branch density on return on assets. According to the discussion about the impact of POS on the performance of banks, the hypothesis to be tested is:

- **H_2: There is a statistically significant impact of POS on ROA.**

IB: Dandago, Farouk, and USMAN (2012) showed that financial institutions can provide high-quality services to customers with less effort, which affects the return on assets. Furst, Lang and Nolle (2002) also showed that institutions that use internet banking services outperformed offline banks in terms of profitability. Malhotra and Singh (2006) indicated that internet banks have better accounting efficiency ratios, higher returns on equity, and higher returns on assets compared to offline banks. However, the results of multiple regression reveal that profitability and the offerings provided through internet banking services have no significant relationship. The univariate analysis in the study of Malhotra and Singh (2009) indicates that internet banks are larger banks and have better operational efficiency and profitability ratios compared to offline banks. According to the discussion about the impact of IB on the performance of banks, the hypothesis to be tested is:

- **H_3: There is a statistically significant impact of IB on ROA.**

Blockchain: Hasan et al. (2020) indicate that the performance of companies in the current year exceeds the performance of the previous year due to the deployment of blockchain technology in corporate operations. In the same context, Ezzi and Mouakhar (2023) showed that the applied blockchain technology has a significant and positive impact on the performance of companies in the field of corporate social responsibility. From the theoretical analysis in the study of Li and Wan (2021) it can be said that blockchain technology works to reduce information transparency and transaction costs while improving trust between institutions and their efficiency to enhance performance. According to the discussion about the impact of blockchain on the performance of banks, the hypothesis to be tested is:

- **H_4: There is a statistically significant impact of blockchain on ROA.**

BS: To account for any confounding effects, bank size was used as a control variable that can correlate with the dependent variable as the main effect component (Tabachnick & Fidell, 2001). The control variable is used to identify and isolate the factors that predict phenomena (Bernerth & Aguinis, 2016). It is necessary to ensure the ability to generalize because it purifies the results and reveals real results (Atinc et al, 2012). The effect of bank size on its profitability has been the focus of many researchers. For example, the results of a study Aladwan (2015) revealed significant differences in the profitability of Jordanian banks of different sizes. A study by Kiragu, Riro, and Maina (2019) concluded that firm size had a positive relationship with the profitability of commercial banks in Kenya. According to the discussion about the impact of BS on the performance of banks, the hypothesis to be tested is:

- **H_5: There is a statistically significant impact of BS on ROA.**

2.4 Conceptual Framework

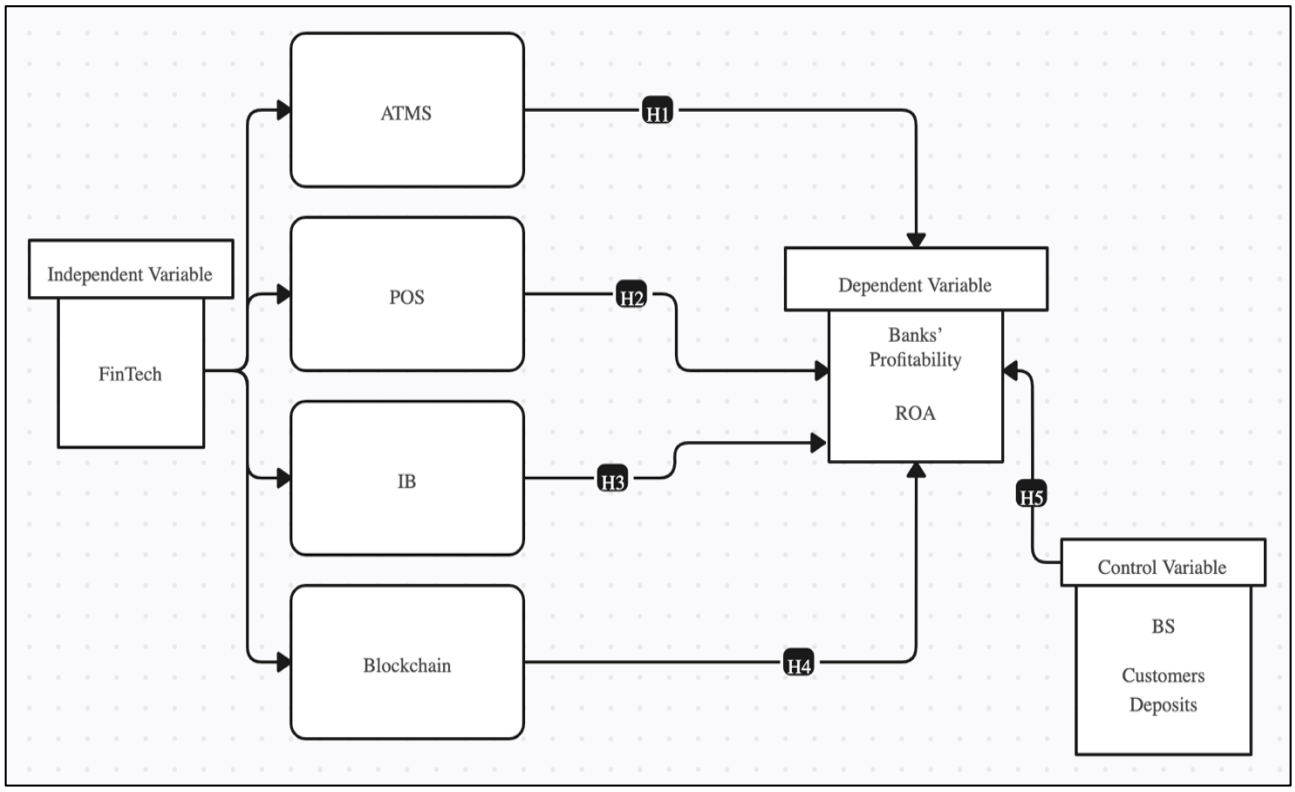
The study adopted FinTech as an independent variable. The term refers to companies that integrate financial services and innovative new technologies, offering Internet-based products. Banks have taken advantage of these improvements to attract customers with products and services that are more user-friendly, efficient, transparent, and automated than those currently available (Dorfleitner et al, 2017).

Fintech also describes the relationship between cloud computing and mobile internet technologies with financial services such as loans, payments, money transfers, and other banking services (Giglio, 2021). According to the study by Kredina (2021), the payments section was defined as including points of sale, ATMs, and Internet banking. The study of Dorfleitner et al. (2017) added that blockchain is part of the payments section. Based on the definition of the term FinTech by previous studies, this study expressed Fintech with four variables: POS, ATMs, IB, and blockchain.

The study adopted profitability as a dependent variable. The study by Chen (2020) ensures that the financial ratio is a crucial indicator of a company's operating ability and profitability. As in the previous literature of Kabajeh et al. (2012) and Oral and Yolalan (1990), ROA provides a great deal of information about a bank's financial performance when compared with prior periods. Based on the above, this study expressed the profitability as ROA.

2.5 The Conceptual Model

The conceptual model reflects the relationship between fintech and bank profitability, taking bank size as a control variable that may affect this relationship.



3. Chapter Three: Methodology

The main objective of this study is to assess the influence of FinTech on the profitability of the banking sector in Palestine between 2016 and 2023. The study's methodology chapter includes seven sections (study approach, population and sample selection, variables, data, statistical tools, rejection and acceptance of hypotheses, and model specification). To ensure the achievement of the study objectives and answer its research questions.

3.1 Study Approach

This study adopts a quantitative approach, relying on secondary numerical data. Data were gathered through field visits to banks and financial institutions to obtain missing or unpublished information related to FinTech implementation, such as launch years and digital service availability. Also, data were collected from official sources, including annual reports of banks and publications by PMA.

The quantitative analytical aspect of the study focuses on measuring the relationship between financial technology and bank profitability using SPSS. Through statistical tools such as descriptive statistics, correlation analysis, and regression analysis, the study objectively evaluates the influence of FinTech indicators, such as ATMs, POS systems, IB, and Blockchain, on ROA.

3.2 Population and Sample Selection

3.2.1 Population: The study population is all banks in Palestine. At the end of 2023, the number of banks in Palestine reached 13 banks, including seven local banks and six foreign banks.

Local banks	Foreign banks
Bank of Palestine (BOP)	Arab Bank (AB)
Palestine Investment Bank (PIB)	Cairo Amman Bank (CAB)
The National Bank (TNB)	Housing Bank for Trade and Finance (HBTF)
Quds Bank (QUDS)	Bank of Jordan (BOJ)
Palestine Islamic Bank (PIB)	Jordan Ahli Bank (JAB)
Arab Islamic Bank (AIB)	Egyptian Arab Land Bank (EALB)
Safa Bank (SAFA)	

3.2.2 Sample: The actual sample of the study was limited to 11 banks only, due to the cooperation of these banks and their provision of the required data. The EALB and CAB were excluded due to their lack of cooperation and the unavailability of necessary data. Accordingly, the sample is classified as a purposive sample, as its selection was based on the availability of information and accessibility, which aligns with the characteristics of this type of non-probability sampling.

3.3 Measurement of variables

Bank profitability was adopted as a dependent variable, and the study used ROA as a measure of bank profitability, as Oral and Yolalan (1990) confirmed that ROA provides a great deal of information about the bank's financial performance when compared to previous periods.

Based on the definition of the term FinTech in previous studies by Giglio (2021), Kredina (2021), and Dorfleitner et al. (2017), financial technology was adopted as an independent variable and expressed as four components that were measured in different ways. For example, the study measured ATMs through the number of ATMs per bank over 8 years. The study measured POS through devices distributed in stores, and the study gave a "1" for the years in which that service was available and a "0" for the years in which that service was not available. While the study measured IB through the banking application, the study gave a "1" if the banking application was available in that year and a "0" otherwise. Finally, blockchain technology was measured through the Bank Account Inquiry System issued by the PMA, and the study gave a "1" for the years in which that website was available and a "0" otherwise. According to Köhler (2015), retail banks fund their activities with customer deposits, so the study took BS as a controlling variable and measured it through "customer deposits".

The Table 3.1 below summarizes how the variables were measured based on previous studies.

COD	Variable	Variable Definition	Citation
Dependent Variable (Profitability)			
ROA	Return on Assets	A measure that expresses the bank's ability to generate profits from its assets. It is calculated by dividing net income by total assets.	Chhaidar, Abdelhedi, & Abdelkafi, 2023

Independent Variable (FinTech)			
ATMs	Automated Teller Machines	Electronic devices that allow customers to access their accounts and conduct selfservice financial transactions. Measured through the number of ATMs.	Jegede 2014
POS	Point of Sale	A non-cash payment method, where consumers use credit or debit cards in the purchase process. It is measured based on the year of addition: "1" for the years in which that service was available. "0" for the years in which that service was not available.	Solms, 2015
IB	Internet banking	Smartphone programs allow customers to manage their bank accounts. It is measured based on the year of addition: "1" if the banking application was available. "0" if the banking application was not available.	Shaikh & Karjaluoto, 2015

Blockchain	Blockchain Technology	The blockchain technology was expressed through "Bank Account Inquiry System", Through this system, a comprehensive, unified, and daily updated database is provided to the Monetary Authority regarding customers' bank accounts.The system provides this data to banks and specialized lending institutions across the banking network. It is measured based on the year of addition: "1" for the years in which that website was available. "0" for the years in which that website was not available.	Michael, Cohn, & Butcher, 2018
Control Variable			
BS	Bank size	Measured through customer deposits.	Köhler 2015

3.4 Data

3.4.1 Data Collection Tools

This study relied on secondary data sources to ensure accurate and comprehensive information on the impact of financial technology on the profitability of banks operating in Palestine during the period 2016-2023.

The financial and technological data were collected from the official annual reports issued by banks operating in Palestine, where the extracted data included the following:

- Financial indicators include net income, total assets, and customer deposits.
- Technological indicators, which are:
  - Year of launching POS service for each bank.
  - Year of launching IB for each bank.
  - Number of ATMs for each bank.

Since some banks did not disclose some of this data in their annual reports, additional measures were taken to complete the missing data, where direct methods of collecting information were resorted to, which included:

- Conducting field visits to some banks to obtain unavailable data and ensuring the accuracy of information related to technological services.

- Sending official requests via email to the relevant departments in the banks to obtain the required data.

In some cases, where some banks did not cooperate in providing data on time, the PMA was contacted to request assistance in accelerating the obtaining of the required data, which in turn helped in providing some of the financial and technological information necessary to complete the study. The instructions of PMA were relied upon to know the year in which the blockchain system service was launched and made available for use by banks.

Ethical practices in scientific research have been adhered to, such as the accuracy of data transmission and ensuring the reliability of sources. The annual reports are audited and approved by an external auditor, which means that they follow the standards of disclosure and transparency in publishing data. It is worth noting that an official letter issued by the university to the banks that were contacted and visited was relied upon, stating that this data is used for academic research purposes only and not for commercial or competitive purposes.

3.4.2 Data Structure

The current study relied on panel data, which combines cross-sectional and time-series data. The choice of panel data analysis is based on its advantages, including increased degrees of freedom and improved estimation accuracy. As emphasized by Antoniou et al. (2008) and Hsiao (2005), panel data offer substantial benefits by capturing both individual heterogeneity and temporal dynamics, thus providing more robust and reliable results.

The dataset consists of 11 banks observed over 8 years (2016–2023), resulting in a total of 88 observations (11* 8 = 88)

3.4.3 Data Analysis

This study relied on secondary data collected from the annual reports of banks operating in Palestine between 2016 and 2023. The data were reviewed for completeness and consistency, then coded and analyzed using SPSS.

The study followed a quantitative approach based on a theoretical model that assumes a relationship between financial technology variables and bank profitability, measured by ROA. The analysis included descriptive statistics to understand data characteristics, followed by correlation analysis and multiple linear regression to test the research hypotheses.

Because the study aims to test specific hypotheses about the impact of FinTech tools on profitability, it is classified as a confirmatory analytical study.

3.4.4 Analytical Model

The investigation relapse model is summarized in the following equation.

$$\mathbf{ROA} = \beta_0 + \beta_1\ \mathbf{ATM} + \beta_2 \mathbf{POS} + \beta_3 \mathbf{IB} + \beta_4\ \mathbf{Blockchain} + \beta_5\ \mathbf{BS} + \varepsilon$$

ROA =Return on Asset (dependent variable)

β_0 = Fixed value in the model, which is the level of banks' profitability without taking the effect of FinTech factors and other controlling variables.

β_1 **ATMs =**The tendency for the independent variable (Automated Teller Machines).

β_2 **POS=** The tendency for the independent variable (Point of Sale).

β_3 **IB =** The tendency for the independent variable (Internet banking).

β_4 **Blockchain =** The tendency for the independent variable (Blockchain Technology).

β_5 **BS =** The tendency for the control variable (Bank size)

ε = Random Error

3.5 Statistical Tools

The study employed the following statistical tools using SPSS:

Descriptive statistics: Mean and standard deviation were calculated to describe the distribution and central tendency of each variable.

Pearson correlation: Used to test the strength and direction of relationships between the independent variables (ATMs, POS, IB, Blockchain, BS) and the dependent variable (ROA).

Multiple linear regression with the inclusion of a controlling variable: Multiple linear regression was used to assess the combined effect of all independent variables on return on assets, with the inclusion of a controlling variable to control for profitability and improve the accuracy of the statistical estimate.

Multiple linear regression without the inclusion of a controlling variable: Multiple linear regression was used to assess the combined effect of the independent variables on return on assets, without the inclusion of any controlling variable, reflecting the direct relationship between the variables without adjusting for additional effects.

3.6 Rejection and acceptance of hypotheses

1- When testing the relationship between financial technology and bank profitability, the following criteria will be adopted:

 Statistical Significance Level (Significance Level - α)

- A 5% (0.05) significance level will be adopted, which is the threshold for accepting or rejecting the alternative hypothesis.

 P-Value

- If P-value ≤ 0.05, the alternative hypothesis (H1, H2, H3, H4, H5) will be accepted, which means that there is a significant relationship between financial technology and ROA.
- If P-value > 0.05, the alternative hypothesis is rejected and the null hypothesis is retained, which means that there is no significant relationship.

 Regression Coefficient (β - Coefficient)

- If β is positive (β > 0) and P ≤ 0.05, it indicates a significant positive relationship, which supports the hypothesis that financial technology has a positive impact on profitability.
- If β is negative (β < 0) and P ≤ 0.05, it indicates that FinTech has a negative impact on profitability.
- If P > 0.05 regardless of the value of β, it indicates that there is no significant relationship between FinTech and bank profitability.

3.7 Model Specification

This study adopts a multiple linear regression model to examine the impact of financial technology on bank profitability. The model is specified as follows:

$$\mathbf{ROA}_{It} = \mathbf{A} + \mathbf{B}_1\,\mathbf{ATM}_{it} + \mathbf{B}_2\,\mathbf{POS}_{it} + \mathbf{B}_3\,\mathbf{IB}_{it} + \mathbf{B}_4\,\mathbf{Blockchain}_{it} + \mathbf{B}_5\,\mathbf{BS}_{it} + \boldsymbol{\varepsilon}_{it}$$

ROA_{it} =Return on Asset (Dependent variable) for bank (i) in year (t).

A = The constant term, which represents the value of ROA when all independent variables are zero.

B_1 $ATMs_{it}$ = Number of Automated Teller Machines for bank (i) in year (t).

B_2 POS_{it} = The tendency for the independent variable (Point of Sale) for bank (i) in year (t). Takes "1" for the years in which that service was available and "0" for the years in which that service was not available.

B_3 IB_{it} = The tendency for the independent variable (Internet banking) for bank (i) in year (t). Takes "1" for the years in which that service was available and "0" for the years in which that service was not available.

B_4 $Blockchain_{it}$ = The tendency for the independent variable (Blockchain Technology) for bank (i) in year (t).

B_5 BS_{it} = The tendency for the control variable (Bank size) for bank (i) in year (t).

ε_{it} = Random Error for bank (i) in year (t).

Where:

- i=1,…,13 refers to the individual banks in the sample.
- t=2016,...,2023 refers to the year of observation.

4. Chapter Four: Results

This study aimed to identify the impact of Fintech on the profitability of the banking sector in Palestine. To accomplish the aims of the study, the researcher analyzed the financial data of the targeted banks (2016-2023).

4.1 Descriptive Statistics of the study data

The table 4.1 displays the basic statistical properties of the variables used in the study, using measures of central tendency and dispersion, such as the mean and standard deviation. This analysis helps provide an initial picture of the behavior of the variables and the extent to which the data is concentrated or dispersed, helping us understand the nature of the relationship between them before moving on to inferential analysis.

Table 4.1 Descriptive Statistics of the study data.

Variables	N	Minimum	Maximum	Mean	Std. Deviation
ATMs	88	4	173	59.20	46.293
POS	88	0	1	.27	.448
IB	88	0	1	.88	.333
Block chain	88	0	1	.63	.487
»BS	88	15,222,694	5,478,560,065	9.51	1.22
ROA	88	2.48717%	2.02565%	0.7214611%	0.78879457%

The table 4.1 presents descriptive statistics for six variables across 88 observations, providing insight into the characteristics of each variable. The number of ATMs ranges from 4 to 173, with a mean of 59.20 and a relatively high standard deviation of 46.29, indicating significant variability in ATM distribution among banks. The availability of POS services, IB, and Blockchain technology is represented as binary variables (0 or 1). The mean value of POS is 0.27, suggesting that only a minority of banks offer this service, while IB has a high mean of 0.88, indicating that most banks provide online banking. Blockchain technology shows moderate adoption, with a mean of 0.63. The ROA, a measure of bank

profitability, has a mean of 0.72% and a standard deviation of approximately 0.79%, showing variation in profitability among the banks. The table also includes the variable BS, which represents the customer deposits of the banks. The customer deposits range from 15,222,694 to 5,478,560,065, with a mean of 9.51 and a standard deviation of 1.22, reflecting a wide variation in BS.

4.2 Correlation between all variables

The table 4.2 examine the association between all variables. This table shows the correlation coefficients between all the variables in the study, including the dependent variable ROA and the independent variables, namely ATMs, POS, IB, addition to BS. This analysis aims to explore whether there is a statistically significant impact of fintech on the ROA.

Table 4.2 Correlation between all variables.

		ATMs	POS	IB	Blockchain	ROA	BS
ATMs	Pearson Correlation		.521**	.256*	.066	.394**	.859**
	Sig. (2-tailed)		.000	.016	.540	.000	.000
	N		88	88	88	88	86
POS	Pearson Correlation			.231*	.316**	.108	.605**
	Sig. (2-tailed)			.030	.003	.314	.000
	N			88	88	88	86
IB	Pearson Correlation				.346**	-.090	.216*
	Sig. (2-tailed)				.001	.405	.045
	N				88	88	86
Blockchain	Pearson Correlation					-.029	.141
	Sig. (2-tailed)					.787	.195
	N					88	86
ROA	Pearson Correlation						.208
	Sig. (2-tailed)						.054
	N						86
BS	Pearson Correlation						
	Sig. (2-tailed)						
	N						
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

The table 4.2 shows the Pearson correlation between all variables. The results indicate that the highest significant correlation is (0.859) between the ATMs and the BS, while the lowest significant correlation is (0.216) between the IB and the BS. In general, the correlation between the variables is moderate correlation, so we expect that this will not affect the multiple linear regression results.

4.3 Multiple linear regression

4.3.1 Multiple linear regression with the inclusion of a controlling variable

Multiple linear regression was used to assess the combined effect of all independent variables on return on assets, with the inclusion of a controlling variable to control for profitability and improve the accuracy of the statistical estimate. As shown in table 4.3

The table 4.3 shows that only ATM affects return on assets (ROA) since the significant value is 0.000, which is less than 0.05. Other variables that do not affect ROA have been excluded.

The table 4.3 Multiple linear regression with the inclusion of a controlling variable

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.651	.228	———	2.854	0.005*
BlockChain	.078	.178	.048	.437	0.663
ATM	.009	.002	.508	4.299	0.000*
POS	-.217-	.214	-.123-	-1.012-	0.314
IB	-.494-	.256	-.208-	-1.931-	0.057

*** The mean difference is significant at the 0.05 level**

While the adoption of financial technology offers numerous potential benefits, its impact on ROA is complex and multifaceted. This study acknowledges that certain technologies can contribute to efficiency and cost savings. For instance, Hannan and Hanweck (1988) demonstrated that ATM deployment could lead to cost savings for banks, supporting the argument that ATMs enhance operational efficiency, and Berger (2003) further discussed how technological advancements like ATMs improve the operational efficiency of financial institutions. However, it is crucial to recognize that the relationship between other FinTech innovations and ROA is not always straightforward. For example, Polasik et al. (2013) discusses that the average time difference between cash and cards is fairly large It suggests that frequent use of cards by customers, a technology often associated with POS systems, lengthens queues and may cause cost increases for merchants, with additional work for cashiers and a risk of losing sales. Additionally, Otamurodov (2017) raised concerns about online banking, noting security vulnerabilities and the non-instantaneous nature of some transactions, factors that may hinder widespread adoption and thus limit the revenue-generating potential of internet banking platforms. Blockchain is still a relatively new technology in the banking sector. Its implementation costs can be high, and its benefits regarding ROA may not be immediately realized. Many blockchain applications are focused on improving security and efficiency in back-office operations, which might not directly translate to short-term profitability gains. Iansiti and Lakhani (2017), in their Harvard Business Review article, discussed the disruptive potential of blockchain but also emphasized the challenges of implementation and the time it takes to realize its benefits. Therefore, it is important to consider both the potential benefits and the associated costs and challenges when evaluating the true impact of FinTech on bank profitability.

4.3.2 Multiple linear regression without the inclusion of a controlling variable

Multiple linear regression was used to assess the combined effect of the independent variables on return on assets, without the inclusion of any controlling variable, reflecting the direct relationship between the variables without adjusting for additional effects. As shown in table 4.4

The table 4.4 shows that only (ATM) has effect on ROA since the significant value is 0.000 which is less than 0.05. Other variables have no effect on ROA. This means that excluding the control variable did not affect the results and they remained the same.

The table 4.4 Multiple linear regression without the inclusion of a controlling variable

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.007	.002		2.854	.005
	ATMs	8.658E-5	.000	.508	4.299	.000
	POS	-.002	.002	-.123	-1.012	.314
	IB	-.005	.003	-.208	-1.931	.057
	Blockchain	.001	.002	.048	.437	.663
a. Dependent Variable: ROA						

4.4 Testing research hypotheses

4.4.1 Results related to the first Hypothesis

There is a statistically significant impact of ATMs on ROA.

To analyze the first hypothesis, a Pearson correlation matrix was used to illustrate the correlation between ATMs and ROA, and the results are shown in table 4.5

The table 4.5 shows that there is a statistically significant correlation between ATMs and ROA. Pearson correlation is 0.394 and the significance value is (0. 000), which is less than (0.05). The more ATMs, the higher the ROA.

The table 4.5 Pearson Correlation Matrix to show the correlation between ATMs and ROA.

Variables/ ***ATMs***		R
ROA	Pearson Correlation	0.394*
	Sig. (2-tailed)	0.000
	N	88

***Correlation is significant at the 0.05 level (2-tailed).**

The study confirms H_1, as the results showed a statistically significant positive impact of ATMs on ROA. This finding aligns with previous research that highlights the role of ATMs in enhancing banking accessibility, improving transaction efficiency, and increasing customer convenience, collectively contributing to higher profitability.

4.4.2 Results related to second Hypothesis

There is a statistically significant impact of POS on ROA.

To analyze the second hypothesis, a Pearson correlation matrix was used to illustrate the correlation between POS and ROA, and the results are shown in table 4.6.

The table 4.6 shows that there is no statistically significant correlation between POS and ROA. Pearson correlation is 0.108, and the significance value is (0.314), which is more than (0.05). The more the POS, the more the ROA in a little amount.

The table 4.6 Pearson Correlation Matrix to show the correlation between POS and ROA.

Variables/ **POS**		R
ROA	Pearson Correlation	0.108
	Sig. (2-tailed)	0.314
	N	88

***Correlation is significant at the 0.05 level (2-tailed).**

H_2 (POS and ROA) is rejected, suggesting that despite the increasing use of POS systems, they do not directly contribute to improving bank profitability. This could be due to low customer adoption rates, high operational costs, or minimal transaction fees associated with POS services.

4.4.3 Results related to the third Hypothesis

There is a statistically significant impact of IB on ROA.

To analyze the third hypothesis, a Pearson correlation matrix was used to illustrate the correlation between IB and ROA, and the results are shown in table 4.7.

The table 4.7 shows that there is no statistically significant correlation between IB and ROA. Pearson correlation is -0.090, and the significant value is (0. 405), which is more than (0.05). The more the IB, the less the ROA for a little amount.

The table 4.7 Pearson Correlation Matrix to show the correlation between IB and ROA.

Variables/ IB		R
ROA	Pearson Correlation	-0.090
	Sig. (2-tailed)	0.405
	N	88

***Correlation is significant at the 0.05 level (2-tailed).**

H_3 (IB and ROA) is rejected, indicating that internet banking services have not yet translated into significant profitability gains for banks. This may be attributed to high implementation costs, regulatory constraints, or customer reluctance to shift to digital banking.

4.4.4 Results related to the fourth Hypothesis

There is a statistically significant impact of blockchain on ROA.

To analyze the fourth hypothesis, a Pearson correlation matrix was used to illustrate the correlation between blockchain and ROA, and the results are shown in Table 4.8.

The table 4.8 shows that there is no statistically significant correlation between Blockchain and ROA. Pearson Correlation is - 0.029 and the significant value is (0. 787) which is more than (0.05). The more the Blockchain, the less the ROA in little amount.

The table 4.8 Pearson Correlation Matrix to show the correlation between blockchain and ROA.

Variables/ **Blockchain**		R
ROA	Pearson Correlation	-0. 029
	Sig. (2-tailed)	0.787
	N	88

***Correlation is significant at the 0.05 level (2-tailed).**

H_4 (Blockchain and ROA) is rejected, implying that, despite its potential in enhancing security and efficiency, blockchain technology has not had a measurable impact on bank profitability. The limited adoption and high initial costs may explain this outcome.

4.4.5 Results related to the fifth Hypothesis

There is a statistically significant impact of BS on ROA.

To analyze the fifth hypothesis, a Pearson correlation matrix was used to illustrate the relationship between blockchain and ROA, and the results are shown in table 4.9.

The table 4.9 shows that there is no statistically significant correlation between BS and ROA. Pearson correlation is 0.163, and the significance value is (0. 130), which is more than (0.05). The more the BS, the more the ROA in a little amount.

The table 4.9 Pearson Correlation Matrix to show the correlation between BS and ROA.

Variables/ **BS**		R
ROA	Pearson Correlation	0.163
	Sig. (2-tailed)	0.130
	N	88

***Correlation is significant at the 0.05 level (2-tailed).**

H_5 (BS and ROA) is rejected, suggesting that bank size alone is not a determining factor in profitability. While larger banks may have greater resources, their operational costs and structural complexities may offset any potential financial benefits.

The table 4.10 The concluded results of the hypotheses

No.	Hypothesis	Result
1	There is a statistically significant impact of ATMs on ROA.	Accepted
2	There is a statistically significant impact of POS on ROA.	Rejected
3	There is a statistically significant impact of IB on ROA	Rejected
4	There is a statistically significant impact of Blockchain on ROA.	Rejected
5	There is a statistically significant impact of BS on ROA.	Rejected

4.5 Discussion the results

4.5.1 Interpreting the Results in the context of the financial and technological reality in Palestine

The findings of this study highlight the unique financial and technological landscape of Palestine, which influences the impact of financial technology on bank profitability. The significant effect of ATMs on ROA can be attributed to the National Switch System (194), introduced by the PMA. This system allows bank customers to withdraw cash and check their balances from any ATM, regardless of their bank affiliation, subject to transaction fees. These fees contribute directly to bank revenues, leading to a more immediate and measurable impact on profitability.

In contrast, other financial technology services, including POS, IB, and blockchain, did not show a statistically significant impact on ROA. This can be explained by several factors. First, the presence of non-banking financial technology firms such as Jawwal Pay and PayPal has diverted a substantial share of electronic transactions away from banks. According to Hurani and AbdelHaq (2025), 48.5% of Palestinians rely on non-banking electronic payment providers, posing a challenge for traditional banks in maintaining customer engagement and transactional revenues.

Moreover, cultural and structural barriers impact financial technology adoption. Awad (2023) suggests that risk aversion and resistance to change—particularly in an environment characterized by political and economic instability—affect the adoption of new financial technologies. Additionally, reduced transaction costs and fee exemptions on digital banking services further limit their contribution to profitability. For instance, the PMA's Directive mandates that transactions through banking apps must be free of charge, preventing banks from generating revenue through these channels.

In addition, the statistically significant impact of ATMs on ROA can be attributed to their direct role in enhancing operational efficiency and reducing transaction costs, as highlighted by Hannan and Hanweck (1988) and further supported by Berger (2003). In contrast, other

financial technologies may face adoption barriers or delayed effects. For instance, IB often suffers from low user trust, limited digital literacy, and security concerns, as noted by Otamurodov (2017), which may hinder its impact on profitability. Similarly, blockchain remains an emerging technology whose benefits on financial performance may require longer implementation periods to materialize, as emphasized by Iansiti and Lakhani (2017). POS systems, while potentially beneficial, may introduce operational challenges and time lags before their advantages are reflected in financial returns, as discussed by Polasik et al. (2013). These factors help explain why only ATMs demonstrated a statistically significant effect on ROA in this study.

Finally, institutional readiness plays a crucial role. Daqar (2021) assessed Palestinian banks' readiness for financial technology transformation and found that leading banks had achieved only 35% compliance with international fintech standards. This indicates a low level of preparedness, further explaining why these technologies have not yet yielded tangible profitability benefits.

In summary, while ATMs have a direct and measurable impact on bank profitability due to feebased transactions, other fintech services face structural, regulatory, and market-related challenges that hinder their immediate contribution to ROA.

4.5.2 Interpreting the Results in Light of Economic and Management Theories

The Solow Paradox

The Solow Paradox, as coined by economist Robert Solow, indicates that the economic and investment impacts of technology are not immediately apparent in performance indicators. Rather, they require more time to be fully absorbed and achieve tangible gains.

The results of this study showed that most financial technology tools (such as point-of-sale (POS), digital banking services, and blockchain technology) did not demonstrate a statistically significant impact on bank profitability (return on assets), except ATMs. This is fully consistent with the Solow Paradox, as many digital tools are still in the early stages of adoption or have not yet achieved effective use that would lead to improved financial performance. For example:

- Blockchain technology is still nascent in Palestine and requires infrastructure, human resources, and clear legislation, which are not yet available.
- Digital banking applications are exempt from fees according to the PMA's guidelines. Therefore, even if they are widely used, they do not generate direct income for banks.
- The adoption of some technologies faces cultural and societal resistance (aversion to change), delaying their potential impact.

Thus, the study's results confirm the validity of the Solow Paradox, demonstrating that investment in financial technology does not necessarily produce immediate economic gains. Rather, it requires time for implementation, a supportive organizational culture, and a qualified infrastructure for its benefits to emerge.

Endogenous Growth Theory

This theory posits that economic growth and improved financial performance result from investments in human capital, innovation, and technology, rather than solely from external factors such as resources or aid.

Relate the theory to the study's findings. Although the study showed that financial technology tools (except ATMs) did not statistically affect profitability, this result does not contradict the theory, but rather reflects a shortcoming in Palestinian banks' investment in technological innovation.

- According to Dakar (2021), leading Palestinian banks achieved only 35% compliance with international fintech standards, indicating a low level of readiness.
- Weak investment in human capital, digital infrastructure, and advanced systems limits the potential to leverage technology as a growth driver.
- Only ATMs—which align with the current operational structure—showed positive results, indicating that technology has an impact when it is effectively integrated into the bank's institutional structure.

Thus, the results indicate that when technology is consciously adopted and invested in, it yields tangible financial benefits, as confirmed by endogenous growth theory.

Diffusion of Innovation Theory

Developed by Everett Rogers, this theory explains how innovations are gradually adopted across segments of society, starting with innovators, then early adopters, then early and late majority, and finally latecomers.

Relate the theory to the study's findings. The study's results showed that many fintech tools have not had a significant financial impact. This is not necessarily due to their failure, but rather because they have not yet been widely adopted among users and institutions.

- The Palestinian environment is still in the "early adopter" stage, or even ahead of it, when it comes to technologies such as blockchain and digital banking.
- Barriers such as low digital literacy, lack of trust in financial applications, and privacy concerns slow the spread of innovation.
- Furthermore, banks' poor systems and staff readiness reduce their ability to provide quality digital services that encourage customers to use them.

Therefore, this theory explains why some fintech tools have not yet yielded profitable results; they simply have not yet spread sufficiently to make a difference financially.

The study's results show that the gap between fintech and profitability is not necessarily due to the technology's ineffectiveness, but rather to the adoption context, investment levels, and institutional readiness. Hence, the three theories – the Solow paradox, endogenous growth theory, and diffusion of innovation theory – provide a profound scientific explanation for the results, enhance the credibility of the analysis, and enrich the conceptual framework of the study.

5. Chapter Five: Conclusion and Recommendations

5.1 Summary of Findings

This study aimed to examine the impact of financial technology components on the profitability of banks in Palestine, measured by ROA. The results are summarized according to the study questions and hypotheses as follows:

5.1.1 What is the impact of ATMs on ROA?

The analysis showed a statistically significant positive relationship between ATM and ROA. This result is supported by the implementation of the National Key Service in Palestine, which has enhanced ATM efficiency by enabling interbank transactions and generating fee-based revenue.

Accepted Hypothesis: There is a statistically significant positive relationship between ATMs and ROA.

5.1.2 What is the impact of POS services on ROA?

The results indicated that there is no statistically significant relationship between POS usage and ROA. This is attributed to the limited use of POS services in the sector, the low transaction volume, and the fact that customers are exempt from any fees when using them. This results in banks incurring operating costs without generating any revenue and reducing the potential for fee-based income.

Rejected hypothesis: There is insufficient evidence to support a positive relationship between POS and ROA.

5.1.3 What is the impact of IB on ROA?

IB has shown no significant impact on ROA. Despite its long-term potential, IB in Palestine continues to face low customer usage rates, technological limitations, and weak revenue generation. The PMA's directive not to charge fees for any transaction made through the banking app has also contributed to the weak impact of this service on bank profitability.

Rejected hypothesis: There is no statistically significant relationship between IB and ROA.

5.1.4 What is the impact of blockchain technology on ROA?

The study found no statistically significant relationship between blockchain implementation and ROA. While blockchain promises operational efficiency, its high implementation costs, regulatory uncertainty, and limited practical application hinder short-term returns. Furthermore, the technological infrastructure is poorly equipped and supported, hindering the optimal implementation of blockchain technology.

Rejected hypothesis: There is insufficient evidence to confirm a positive relationship between blockchain and ROA.

5.1.5 What is the effect of BS on ROA?

The data did not reveal any statistically significant relationship between BS and ROA. Although larger banks may benefit from economies of scale, these advantages may be offset by higher administrative costs and greater market constraints.

Rejected hypothesis: The relationship between BS and ROA is not statistically significant in the Palestinian context.

5.2 Conclusions

The results of the hypothesis testing reveal a comprehensive understanding of the relationship between FinTech components and ROA, in the context of the Palestinian banking sector. Of all the variables tested, only ATM usage showed a statistically significant positive relationship with ROA. In Palestine, this significance was reinforced by implementing the National Switching System, which standardizes ATM usage across all banks and enables fee-based transactions.

Conversely, the study rejected the remaining hypotheses, as POS, IB, blockchain technology, and BS did not show any statistically significant relationship with ROA. These findings attributes to low adoption rates and limited transaction fee revenue. Similarly, while investment banking and blockchain technology offer long-term operational benefits, their high implementation costs, limited customer usage, and regulatory challenges limit their short-term financial returns.

The lack of a significant effect of bank size may also reflect contextual differences. While larger banks typically benefit from economies of scale, this advantage may be offset by higher administrative costs and market constraints, as observed in the Palestinian banking system.

In conclusion, the findings confirm that while financial technology adoption is feasible, its impact on profitability is not uniform across technologies. This depends on contextual factors such as regulatory policies, market readiness, technological infrastructure, and consumer behavior. Therefore, future strategies for integrating fintech in Palestine must take these dynamics into account to maximize their financial and operational returns.

5.3 Study Implications

5.3.1 Theoretical Implications

This study enhances the theoretical understanding of how financial technology impacts bank profitability. It questions the assumption that digital transformation uniformly improves performance, suggesting that the impact of financial technology is mediated by contextual factors such as market structure, cultural attitudes, and regulatory environments. The study supports the idea that financial technology adoption also includes its actual integration into consumer behavior and corporate strategy, rather than its mere presence. This nuanced perspective provides a more realistic basis for future theoretical frameworks.

5.3.2 Practical Implications

From a practical perspective, the findings highlight the need for Palestinian banks to adopt financial technology solutions tailored to local conditions and consumer preferences. The clear positive impact of ATMs on profitability suggests that investing in these technologies yields tangible returns. Conversely, the limited impact of POS and online banking services underscores the importance of increasing customer awareness, trust, and usage. This highlights the need for collaboration between banks and financial technology companies to create a more cohesive digital payment environment and develop their digital infrastructure in line with international standards. In addition, regulators should re-draft new policies that enable banks to recover costs while enhancing accessibility and inclusion.

5.4. Recommendations

In light of the previously mentioned results, the researcher suggests the following recommendations:

Banks operating in Palestine: Enhancing investment in ATMs, given their proven positive impact on return on assets, by increasing their deployment in underserved areas, improving service efficiency and quality, and adopting modern technologies such as biometric and cardless ATMs. Also, developing effective strategies to leverage other fintech tools by supporting their deployment through collaboration with small businesses and retailers, and offering incentives such as loyalty programs or co-marketing. Additionally, launching educational campaigns that build customer confidence and awareness of the security and ease of use of these services. Offering value-added paid services within digital platforms while maintaining the free availability of essential services in line with regulations.

The Palestine Monetary Authority: Reviewing regulatory frameworks to enable banks to achieve sustainable returns from digital transformation without imposing additional financial burdens on customers. Promoting policies that encourage banks to partner with fintech companies within a flexible and secure regulatory environment.

Fintech companies (such as Jawwal Pay and PalPay): Enhancing integration with banks to provide unified and seamless digital services that enrich the user experience. In addition to investing in valuable technological solutions for banks, with a focus on secure interaction, ease of use, and reduced operating costs.

Ministry of Finance and Planning and Economic Policymakers: Use the study results to integrate financial technology into national policies and strategies, achieving financial inclusion and enhancing economic growth. Digital initiatives can also be supported that enable banks to efficiently transition to technological services without compromising the stability of the financial system.

Telecommunications Service Providers: Develop the communications infrastructure to support mobile banking services, especially in rural and remote areas. Focus on collaborating with banks and digital financial service providers to ensure stable connectivity and rapid performance.

By implementing these recommendations, Palestinian banks can better harness financial technology to improve their profitability and long-term sustainability in an evolving digital landscape.

5.5 Recommendations for Future Research

In light of the limitations discussed, future research is encouraged to:

1- Expand the scope of fintech components studied, including mobile wallets and open banking platforms.

2- Use multiple profitability indicators such as ROE and net profit margin for more holistic analysis.

3- Incorporate qualitative data, such as customer attitudes and employee readiness, to understand behavioral aspects of fintech adoption.

4- Explore additional control variables such as organizational culture, digital literacy, and resistance to change.

5- Apply advanced statistical techniques or mixed-method approaches to capture complex relationships.

6- Conduct comparative studies with other countries to better understand contextual differences in fintech effectiveness.

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تأثير التكنولوجيا المالية على ربحية القطاع المصرفي في فلسطين

شذى عبد الله محمد لدادوة
د. رشا توفيق يوسف العبادي
د. محمد توفيق حسن أبو شربة
د. شريف مصباح ناصر أبو كرش

ملخص

هدفت هذه الدراسة إلى استقصاء العلاقة بين التكنولوجيا المالية وربحية القطاع المصرفي في فلسطين، وذلك من خلال تحليل بيانات ثانوية مستخرجة من التقارير السنوية للبنوك العاملة في فلسطين ومنشورات سلطة النقد الفلسطينية، خلال الفترة الممتدة من عام 2016 حتى 2023. تم قياس ربحية البنوك، بوصفها المتغير التابع، من خلال مؤشر العائد على الأصول، فيما تم التعبير عن التكنولوجيا المالية، بوصفها المتغير المستقل، بأربعة مؤشرات فرعية: عدد أجهزة الصراف الآلي، توفر الخدمات المصرفية الإلكترونية، عدد نقاط البيع، واستخدام تقنية البلوك تشين، كما تم استخدام حجم البنك كمتغير ضابط. وقد تم تحليل العلاقة بين المتغيرات باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية.

أظهرت نتائج الدراسة وجود علاقة ذات دلالة إحصائية بين عدد أجهزة الصراف الآلي وربحية البنوك العاملة في فلسطين، بينما لم تُظهر مؤشرات نقاط البيع، والتطبيقات المصرفية، وتقنية البلوك تشين، وحجم البنك أي تأثير معنوي على الربحية خلال فترة الدراسة. وقد خلصت الدراسة إلى مجموعة من التوصيات الموجهة للمؤسسات التشريعية والباحثين في هذا المجال.

الكلمات المفتاحية: التكنولوجيا المالية، أجهزة الصراف الآلي، نقاط البيع، الانترنت البنكي، سلسلة الكتل.