An-Najah National University
Faculty of Graduate Studies

THE IMPACT OF IMPLEMENTING ARTIFICIAL INTELLIGENCE ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS LISTED ON THE PALESTINE AND AMMAN STOCK EXCHANGE FOR THE PERIOD FROM 2015 TO 2023

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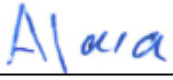
Dr. Ala'a Aldain Dwikat **Co-Supervisor**	 **Signature**
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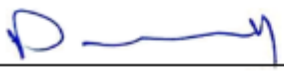
Dr. Sameh Atout **Internal Examiner**	 **Signature**

Dedication

الحمد لله والصلاة والسلام على رسول الله اما بعد، الى شهداءَ فلسطين الذين كتبوا بدمائهم الطاهرة أنشودة المجد والحرية، وسَطَّروا على ثرى الوطن معاني التضحية والإباء. هم أحياءٌ فينا وإن غابوا، باقون في الذاكرة والقلوب، نُقسم ألا ننساهم ما دامنا في هذه الحياة، وندعو لهم بالرحمة والرضوان، وأن يُكرمهم الله منازل الصدّيقين، ويُبشّرنا قريبًا بفرجٍ يُحرر الأسرى والمسرى، ويُعيد البهجة لأرضنا الحبيبة.

إلى أبي العزيز، سندي الأول، وشعلة الحكمة في حياتي، شكرًا لدعمك الذي لا ينضب.

إلى أمي الغالية، نبض قلبي، ورفيقة دعائي، لولاكِ لما وصلت.

وإلى عائلتي الكريمة، إخوتي وأخواتي، أنتم الحُبّ والدّعم، واليد التي أتممت بها هذا الطريق.

Acknowledgments

قَالَ اللَّهُ تَعَالى: ﴿ وَقُل رَّبِّ زِدْنِي عِلْمًا ﴾[طه، 114]

الحمد لله الذي بنعمته تتم الصالحات، وبتوفيقه يُدرَك النجاح وتُنال الغايات.

أتقدّم بأسمى آيات الشكر والعرفان إلى كل من كان له أثر في إتمام هذا البحث المتواضع، ولكل من قدّم لي الدعم، ولو بكلمة طيبة أو دعوة خالصة.

وأخص بالشكر والامتنان لأساتذتي المشرفين د. غسان دعاس و د. علاء دويكات، الذين لم يبخلوا عليّ بعلمهم وتوجيهاتهم السديدة، فكانوا نِعم المعين في مسيرة البحث. جزاهم الله عني خير الجزاء، وبارك في علمهم وجهدهم.

كما أتقدّم بخالص التقدير إلى لجنة المناقشة الكريمة، على وقتهم الثمين، وقبولهم مناقشة رسالتي المتواضعة..

ولا أنسى أن أشكر كل من وفّر لي معلومة، أو قدّم لي مشورة، أو دعمًا معنويًا خلال مراحل هذا البحث.

فلكم جميعًا مني أصدق عبارات الامتنان، وأسأل الله أن يجعل هذا العمل نافعًا ومباركًا.

Declaration

I, the undersigned, declared that I submitted the thesis entitled:

THE IMPACT OF IMPLEMENTING ARTIFICIAL INTELLIGENCE ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS LISTED ON THE PALESTINE AND AMMAN STOCK EXCHANGE FOR THE PERIOD FROM 2015 TO 2023

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's Name	**Ameer Abbas Dwikat**
Signature:	
Date:	**07/08/2025**

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Abstract

This research examines AI impact on the financial performance of commercial banks listed in Palestine and Amman stock exchange from 2015 to 2023. The main objective of this research is to determine whether commercial banks financial performance can be improved by implementing AI technologies in emerging markets that characterized by differing economic and technological environments. Financial performance assessment in this study relies on four measurement indicators which include Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM) and Market Share (MS), AI disclosure Assessment depend on whether commercial banks included details about their AI-related business practices or technologies in their financial reports or not, while corporate governance represented by 7 variables which are (bank size ,Ownership concentration, board size, Long term debt ratio, CEO duality, Gender diversity and Number of board meetings) served as controls to explore institutional factors affecting the AI–performance relationship.

This research adds to digital transformation growing body of literature regarding banking industry's by presenting empirical evidence obtained from emerging market. This plays an essential role in helping banks reach their operational goals and boost both market position and shareholder wealth. Finally this study provide some practical recommendations for banks, regulators, and future researchers, highlighting the need for greater investment in AI technologies, improved governance frameworks, and broader comparative studies across regional and international contexts.

The study has found that artificial intelligence disclosure has a significant effect on the financial performance of commercial banks that are listed on Palestine and Amman Stock Exchanges over the period of 2015-2023. The empirical findings showed that AI

disclosure is positively associated with both return on assets (ROA) and market share, which implies higher operational efficiency and market share, with moderate yet significant being the relation to both return on equity (ROE) and net interest margin (NIM). All these results were explained under six theoretical frameworks as the Resource-Based View of the Theory, Technology Acceptance Model, the Transaction Costs Model Agency Theory, the Contingency Theory, and the IS Success Model. These frameworks, combined, offered the conceptual framework to the hypothesis underlying the study and served to identify the mechanisms through which AI adoption and disclosure support profitability, efficiency, and long-run sustainability in the banking industry.

Based on these results, the study recommended Palestine and Jordan commercial banks to follow a more uniform practices in disclosing artificial intelligence applications, as it would result in greater transparency and comparability across establishments. In addition banks should also invest more in technological infrastructure, employee training, and data management infrastructure to realise the full efficiency benefits attached to the use of AI. It is also necessary to strengthen mechanisms of governance to provide the possibility to effectively control the AI initiatives as it would reinforce the aspects of accountability and reduce the risks. Lastly, it is suggested that regulators and policymakers should work on developing harmonized reporting habits of AI disclosures which would foster the decision-making of various stakeholders, enhance confidence in the market and lead to the over-all competitiveness and robustness of the banking sector.

Keywords: Artificial Intelligence, Financial Performance, Commercial banks, Palestine, Jordan, Corporate Governance

Chapter One
General framework

1.1 Introduction

Artificial intelligence (AI) has quickly become one of the most transformative technologies in the global banking sector, thereby altering the ways through which banking firms manage, compete and provide services. AI solutions have become essential tools at banks across the world, improving efficiency, cutting costs, and allowing providers to offer customized services by employing analysis and processing of current information. Not only does this shift toward AI improve the performance and cutthroat strategies of banks, but it also raises new standards in the ways customers are attended to (Acciarini, Cappa, Boccardelli, & Oriani, 2023). In Middle east countries, especially Jordan and Palestine, the use of AI is gradually being embraced mainly by the banking institutions since they have identified it as a solution to emerging challenges in their respective regions. AI's incorporation within these sectors is crucial in enhancing financial accessibility and banking services while also maintaining compliance with various regulatory frameworks (Shiyyab, Alzoubi, Obidat, & Alshurafat, 2023). By using artificial intelligence-based solutions for fraud detection, customer support, and financial risk management, Jordanian and Palestinian banks will not only improve their technological portfolio but also plan their future for the socio-economic challenges of the region. By adopting AI, these banks have managed to improve their productivity, stability, and competitiveness in the growing global digitalized economy, as technology is used to overcome challenges and take advantage of the opportunities offered in the financial industry (Kaddumi, Baker, Nassar, & A-Kilani, 2023).

The research aims to explore the impact of AI disclosure on the financial performance of commercial banks in Jordan and Palestine by analysing key financial indicators such as return on assets (ROA), return on equity (ROE), net interest margin (NIM) and market share (MS). This study will assess how the adoption of AI technologies impacts these metrics, providing insights into whether AI can enhance profitability, efficiency, and market competitiveness in these emerging markets. By doing so, the research seeks to offer empirical evidence on the potential benefits of AI in improving the financial performance of banks in these specific regional contexts.

1.2 Statement of the Study Problem and the Study Questions

AI has emerged as a cornerstone of innovation across various industries. Globally, AI is redefining how financial institutions operate, offering advanced capabilities for data analysis, decision-making, and process automation (Shiyyab, Alzoubi, Obidat, & Alshurafat, 2023). These advancements are reshaping the competitive landscape of the banking industry by enabling institutions to reduce costs, enhance operational efficiency, and offer personalised services at an unprecedented scale. The ability of AI to process large volumes of data in real time coupled with its capacity for predictive analytics positions it as a critical tool in modern banking industries as banks worldwide increasingly adopt AI to maintain a competitive edge. Uunderstanding the relationship between AI disclosure and financial performance has become a pivotal area of research (Sharma, 2023).

However, most existing literature focuses on developed economies where AI adoption is more widespread. This leaves a significant gap in understanding AI's impact within emerging markets, particularly in the Middle East. Jordan and Palestine present unique environments where AI adoption in banking is still in its early stages, influenced by regional challenges such as economic instability, geopolitical factors, and varying levels of technological infrastructure (Al-Jarrah, Badarin, & Almohammad, 2024). These factors contribute to a complex landscape where the potential benefits of AI may not be as straightforward as in more technologically advanced regions. It is, therefore, essential to narrow the scope of this study to these two countries and address the uncertainties regarding the extent to which AI adoption can tangibly improve financial performance in the Jordanian and Palestinian banking sectors. This gap in knowledge presents a critical problem for both academia and industry practitioners who seek to understand the strategic value of AI in these emerging markets. Without empirical evidence, it is challenging to assess whether AI investments are likely to yield the expected benefits or if they might exacerbate existing challenges (Abuhasan & Moreb, 2021).

This study aims to provide a nuanced understanding of how AI influences financial outcomes in Jordan and Palestine, offering evidence-based insights that can guide future AI strategies in these markets. The findings are expected to have far-reaching implications, contributing not only to the academic literature but also informing decision-

making processes for bank managers, investors, and policymakers. In conclusion, the core problem this research addresses is the lack of empirical evidence on the impact of AI on financial performance in the banking sectors of Jordan and Palestine.

Accordingly, we can highlight the following main question:

Q1: Does AI-related disclosure have an impact on banks' financial performance of the Jordanian and Palestinian stock exchanges measured by return on asset.

In addition to this main question I will at the end of this research answer these following sub questions to support the answer to the main question:

Q1-1: Does AI-related disclosure have an impact on banks' financial performance (measured by return on equity) in the Jordanian and Palestinian stock exchanges?

Q1-2: Does AI-related disclosure have an impact on banks' financial performance (measured by net interest margin) in the Jordanian and Palestinian stock exchanges?

Q1-3: Does AI-related disclosure have an impact on banks' financial performance (measured by market share) in the Jordanian and Palestinian stock exchanges?

1.3 Research Objective

1. Determine the impact of AI-related disclosure on banks' financial performance (measured by return on asset) in the Jordanian and Palestinian stock exchanges.
2. Determine the impact of AI-related disclosure on banks' financial performance (measured by return on equity) in the Jordanian and Palestinian stock exchanges.
3. Determine the impact of AI-related disclosure on banks' financial performance (measured by net interest margin) in the Jordanian and Palestinian stock exchanges.
4. Determine the impact of AI-related disclosure on banks' financial performance (measured by market share) in the Jordanian and Palestinian stock exchanges.

1.4 Research importance

There is a worldwide concentration on AI disclosure and its impact on banks' financial performance as financial institutions continue integrating AI technologies into their operations (Haddad, 2010). However, despite the global interest in this area, there is a significant gap in the literature regarding the specific effects of AI disclosure within the banking sectors of Jordan and Palestine. While there is substantial research on AI's impact on financial institutions in developed economies such as North America, Europe, and East Asia, the Middle Eastern context, particularly in Jordan and Palestine, remains underexplored. Few studies have investigated this topic such as the study of Shiyyab, Alzoubi, Obidat, & Alshurafat (2023) that aimed to determines to what extent Jordanian banks refer to and use artificial intelligence (AI) technologies in their operation process and examines the impact of AI-related terms disclosure on financial performance. Also Hameed, (2022) conducted a study to evaluated whether the use of Artificial Intelligence (AI) and Social Innovation in the banking sector serves as a valuable tool in decision making for the Central Bank of Jordan (CBJ) and found a strong positive correlation between the use of Artificial Intelligence and Social Innovation in the decision-making which in turn assist in improving the financial performance for the central bank of Jordan. In addition, other studies like Kaddumi, Baker, Nassar, & A-Kilani (2023) examined the impact of the adoption of financial technology on conventional banks' financial performances listed in Amman stock exchange through studying the effect of financial inclusion, alternative payment method and process automation and concluded that all three-variable reflected positive significant impact on Jordanian commercial bank's financial performance indicators. Furthermore Al-Jarrah, Badarin, & Almohammad (2024) aimed to determine the role of AI in developing the accounting system in Jordanian Islamic banks and suggested in study findings that AI (big data, intelligent agents, expert systems, and automation processes) has a positive impact on the development of Jordanian Islamic banks' accounting systems which include financial and reporting systems.

As for the Palestinian banking sector, we find a clear gap in literature that investigated the topic of artificial intelligence and financial performance. Finding a single study that talks explicitly about this topic is not easy. This gap is particularly noteworthy given these

countries' unique economic, regulatory, and socio-political environments, which may lead to different outcomes than those observed in other regions (Hurani, Abdel-Haq, & Camdzic, 2024). The absence of focused studies on this topic within the Jordanian and Palestinian banking sectors highlights the need for research that delves into how AI disclosure influences financial performance in these specific contexts, and here comes the role of this study as a qualitative addition to the present new topics to delve deeper into the relationship between these two variables, especially in Palestine, and to identify the extent to which banks rely on artificial intelligence tools in their daily operations.

The impact and implications of this research extend beyond the academic community to include practical applications for banks, regulators, and policymakers in Jordan and Palestine. For banks, the study's findings could inform AI implementation and disclosure strategies, helping them optimize their financial performance while maintaining transparency and trust. For regulators and policymakers, this research could provide evidence-based insights into the effectiveness of current disclosure regulations and suggest areas for improvement or reform. The study's implications could also resonate with other emerging markets facing similar challenges, offering a blueprint for how AI disclosure can be managed to enhance financial performance. Moreover, the research could have long-term implications by influencing how AI technologies are perceived and adopted in the broader Middle Eastern banking sector.

1.5 Theoretical framework and hypotheses development

1.5.1 Conceptual framework

1.5.1.1 Artificial Intelligence (AI)

Over the years, the concept of artificial intelligence has changed due to the development of artificial intelligence and the change in academic and researchers' understanding of its essence, so we can find a group of studies that define AI in different ways. According to Shiyyab, Alzoubi, Obidat, & Alshurafat (2023) AI is defined as the developed computer systems that can perform various tasks that require human-like experience to achieve and the ability to gain knowledge by having access to extensive databases, analyzing and comparing functions, making decisions, tracking the results of those decisions, and comparing them to the desired outcomes. Sharma (2023) defines AI as the computer

science branches that specialize in building software systems that can learn by using coding algorithms that can provide this software with human skills such as perception, data collection, analyzing, critical thinking, reviewing, and comparing outcomes at a higher level than average humans could do.

AI can improve banks' financial performance in several ways. Skrebeca, et al. (2021) state that AI supported chatbots provide customer support and functions 24/7. These chatbots use natural language processing (NLP) to give customized responses to customer questions based primarily on gender preference records, thereby strengthening sponsor engagement. Also, Bertino, et al. (2021) stated that these chatbots can provide personalized financial plans, electronic brochures, and a set of suggestions, such as the questions most asked by customers, the most requested reports and new services. Another aspect through which AI can assist in improving financial performance is Credit scoring model according to Sadok, Sakka, & El Maknouzi (2022) these models use machine learning algorithms to access big data bases and evaluate which customers have the ability to repay their loans with the lowest possible lending risks by obtaining deep insight through available data about these customers previous financial performance and evaluate the accuracy and transparency of the information published by companies in their financial reports through analysing the announced financial numbers, analysing the relationship between different accounts, and determining the possibility of using earning managements techniques. In addition, Artificial intelligence can be used to provide decision makers with high-quality information which can be used to build accurate reports, Dingre (2022) claimed that AI can highlight commonly made mistakes such as spelling mistakes, wrong format, and duplicated entries to improve the quality and validity of data and provide users with possible solutions and alternative data sources.

According to Naim (2022) AI has gained significant importance as a tool used to identify and minimize risks in business, financial and other related fields. This is because AI have the capabilities of identifying, assessing and managing various types of risks, ranging from financial frauds and cyber-attacks to operational and regulatory compliance risks. Sadok, Sakka, & El Maknouzi (2022) stated that AI models can utilize many different parameters ranging from social media activity to the frequency and amount of transactions to create more efficient and accurate measures to customers credit scores and

assess their credit risks. In addition, Kaur, Kumar, & Kaur (2023) discussed in his study the role of AI in cybersecurity processes and mentioned that AI based security defences can track and distinguish typical user activity and quickly recognize suspicious activities that may indicate that a cyber-attack is taking place or even take a proactive step in identifying potential failures before they happen.

Ai can help banks to allocate suitable services and prices for certain customers gropes by dividing customers to segments based on several factors such as demographic, behavior, geographic and value-based characteristics (Mandapuram, Gutlapalli, Reddy, & Bodepudi, 2020). Such segmentations are vital since banks' competitive advantage depends on optimized pricing strategies that emerge after segmenting customers according to their values and aligning banks' business models with market demands which lead to creating dynamic pricing strategies which could quickly adapt to changes in financial and economic situations by arranging marketplace data in real time and identifying fluctuations and adjusting prices to remain competitive while ensuring profitability (Duangekanong, 2022). To create such pricing strategies AI can coordinate marketing, sales and financial activities to ensure a consistent internal system that can reduce the risk of miscommunication between salespersons and financial managers and provide banks with new ideas about how to modify their offering to attract customers attention (Venigandla, Vemuri, Thaneeru, & Tatikonda, 223). Also, AI is very important when it comes to Cross-selling strategies which enable banks to introduce existing customers to non-core or complementary products or services to the ones they already have, this can be achieved using practiced value-based segmentation which addressing the behavior, inclination and basic needs of various customer groups to design highly relevant products then determine high value customers and offer them premium services like wealth management services, using customized credit cards and specialized investment portfolios services (Haag, Hopf, Vasconcelos, & Staake, 2022).

Many previous researches have investigated the barriers that may hinder the use of artificial intelligence in fraud detection for example, Bertino et al. (2021) referred to data quality and Privacy problem which stated that banks need to find a way to balance between the need for gathering various data with protecting people's privateness which form a big challenges since AI usage is primarily based on having access to a large amount

of data including monetary transactions and the way people behave on-line. In addition, Walton (2018) referred to that skill gap and complexity impose a highly challenging obstacle for AI implementation since AI requires sophisticated statistical models to enhance machine learning and such demands require highly specialized expertise in programming and logical database management which is costly and hard to Maintain. Likewise regulatory compliance plays an important role in AI implementation process since regulatory requirements such as data security and privateness laws and anti-cash laundering acts may form a limitations in AI implementation by requiring banks to illustrate the effectiveness, accuracy, and reliability of AI-powered systems thru rigorous checking out, certification, and auditing processes which can consist a burden on banks shoulder (Malhotra, 2019). Finally, Sloman (2005) concluded that a successful implementation of AI technology there is a need for good communication and collaboration between banks divisions which can be faced with many restrictions since banks generally have different departments responsible for specific functions like risk control, compliance and strategic planning and these departments tend to function in isolation.

1.5.1.2 Financial performance

Financial performance is a broad concept that refers to how organisations or companies achieve their objectives by utilising financial assets to create value for stakeholders. This concept includes many figures and ratios that are taken together to offer an image of financial structure, financial performance and financial solvency at a given time in a particular period (Jayasekara, Perera, & Ajward, 2020). Many definitions of financial performance were introduced by different researchers like Fernandes, Farinha, Martins, & Mateus (2018) who viewed financial performance from the standpoint of shareholder-added value which is increasing the shareholders' wealth using measures as return on equity and return on assets. Alam & Chowdhury (2021) described financial performance according to the market performance context which is an evaluation of the current standing of the organisation's stocks and shares where people wish to invest or trade.

So, in this study I will measure bank financial performance using 4 different variables with focusing on ROA as the main variable to measure bank financial performance and use the other three variables to support the results.

1. Return onasset (ROA)

Return on assets (ROA) is a direct ratio which reflects the overall profitability of a business venture presented in the ratio of accumulated profit to the total assets. It shows how well an organization can manage its resources to produce gross revenue after excluding certain expenses (Singh, 2023). Thus, ROA can be a useful measure to understanding how banks utilize assets in generating incomes by providing shareholders with an understanding about bank efficiency in asset utilization since High ROA percentage means that bank is wisely utilizing resources to make profits (Cantero-Saiz, Polizzi, & Scannella, 2024). Also, ROA can be viewed as a relative measure that enables shareholders to compare the performance of their bank with other banks regardless of their size. For instance, if a smaller bank has a higher ROA than a large bank, it could mean the small-scale bank is more effective in utilizing the available assets (Sinițîn & Socol, 2020). In addition Sinițîn & Socol (2020) stated that RAO analysis relates to the risk management practices of a specific bank since consistently high ROA can be mean that the bank is efficient in using assets and has good managerial practices in dealing with risks like avoiding loan losses, managing the assets mix, and achieving the right combination between high returns and safe investments.

On the other hand other studies like Hung, Yeung, Tanaka, & Bornstein (2020) Highlighted the challenges and limitations of AI implementation in banking industry such as data privacy concerns, the complexity of integrating AI with existing systems, and the potential for regulatory hurdles that can limit the effectiveness of AI implementations which may reduce AI improvement on ROA especially after considering that AI initial investment and implementation costs can offset the benefits. Also Losbichler & Lehner (2021) pointed out that there is an inverse relationship between return on assets and the use of artificial intelligence since implementing AI technology present new operational risks that may harm the financial performance like cybersecurity risks and the issue of algorithmic bias which defined as prejudice and unfair treatment by algorithms based on data sets used for training the algorithms or the structure of the algorithms themselves.

Based on these studies the following hypothesis were developed:

H1: AI disclosure has a positive impact on the financial performance (measured by ROA) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

2. Return on equity

ROE is a performance indicator that determines the degree of bank profitability and its capability to generate profits out of the shareholders' funds since it measures the amount of net income generated for each dollar of equity as a percentage (Ahsan, 2012). High ROE indicates bank efficiency in utilizing investors funds which helps banks to build a good reputation and attract funds ultimately causing share prices to rise and provide sustainable cash flow by encouraging investors to buy and hold bank shares (Moussu & Petit-Romec, 2017).

According to Pagratis, Karakatsani, & Louri (2020) ROE acts as a vital performance measure that can be used to assess the earning quality and earnings management of a bank since high and stable ROE numbers suggest that the bank is obtaining high returns from its business model and is not resorting to manipulating financial results by using aggressive accounting practices that can include hurriedly recognizing revenues or delaying expenses or resorting to off-balance-sheet financing. According to Challoumis (2025) stated that ROE gives a clear picture concerning the amount of capital that a bank must hold to keep producing profits. High level of ROE implies that the bank is indeed able to generate large profits from the funds that have been invested in equity, thus showing that there are excess reserves in the bank. In addition, ROE is widely known for helping banks outlining the best financing strategy which involves making decisions on financing through debt or equity. High ROE's consistency points out bank ability to expand without incurring more debts or harming the solvency status. This may result in a more leveraged capital structure which will allow the bank to fund investment in new technologies to improve the current profitability levels (Adejola, Noguera, & Lambe, 2024).

On the other hand, some researchers like Qiao, Chen, & Qiao (2022) stated that implementing AI technologies does not guarantee return on equity improvement because of the challenges that banks face in implementation and post implementation phases such as high Implementation Costs, regulatory and Compliance Issues like the complexity of ensuring that AI systems comply with these regulations, lack of skilled personnel, uncertain return and disruption to workforce since AI can cause job replacement. Also, Horobet et al. (2021) mentioned that the costs of continuous adaptation to rapid technology advancement can reduce short-term profitability, restrict revenue generating activities and hinder the work of bank department since AI system improvement need Intensive cooperation and information sharing between bank various departments.

Based on these studies the following hypothesis were developed:

H2: AI disclosure has a positive impact on the financial performance (measured by ROE) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

3. Net interest margin

Net Interest Margin (NIM) is one of the principal financial ratios used by banks to determine banks' lending profitability and determine bank efficiency in managing available assets and liabilities. This ratio is calculated by subtracting interest from loans and other assets that have an interest income component from the interest paid to depositors then divide the result by the total earning assets (Abdeljawad & Bahlaq, 2023). When a bank has NIM rate above industry average this indicates that the bank is earning more in its lending functions as compared to other banks, which is a measure of its better financial performance and efficient interest rate management (Desiderio, Magagnin, Kalinin, & Döttling, 2019). This ratio can be used to measure the financial performance of banks due to the understanding it provides to investors about the effects of economic conditions on the financial position of a bank through following economic cycle stages and observe each phase effect on banks NIM, for example during economic expansion phase the demand for loans tends to go up making it possible for banks to charge higher interest rates hence enhancing the NIM. On the other hand, during the recession phase

customers demand a credit decrease which will reduce NIM since interest rates may also be low due to demand and supply forces (Alzeghoul & Alsharari, 2024).

Durguti, ALIU-ZHUJA, & ARIFI (2014) stated that the cost of funds represents the interest-bearing obligations of a bank including borrowed money and deposit from clients and by keeping such costs low banks can report a higher NIM as the earnings from loans and other investments surpass the costs of borrowing. Saksonova (2014) suggested that effective cost of funds management relates to the proper choice of deposit and other sources of funds to control interest expenses and maintain the necessary liquidity level, for instance, achieving low cost of funds via successful implementation of customer relations and competitive rates for deposits improve bank NIM. According to Gyau, Appiah, Gyamfi, Achie, & Naeem (2024) banks need to keep proper watch over the changes to the global interest rates to recognize how their profitability is affected by government monetary policies and change their interest rate policies correspondingly, so by identifying the influence of the monetary policy on NIM, a bank can define its financial orientations.

Based on these studies the following hypothesis were developed:

H3: AI disclosure has a positive impact on the financial performance (measured by NIM) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

4. Market share

According to Genchev (2012) market share (MS) in the banking sector can be defined as the ability of a certain bank to conduct its operations in a definite market or industry regarding the overall business conducted within this sector expressed in terms of total assets, deposits, loans or total revenues to market totals. Etale, Bingilar, & Ifurueze (2016) considered this ratio an important indicator for bank success in the long term since big banks can acquiring and maintaining customers since customers' perception of the bank brands is good and customers have loyalty to bank names due to good marketing practices and the variety of financial services that could be provided.

Abdulsalam & Tajudeen (2024) stated that this ratio can be used to measure the financial performance of banks due to the understanding it provides to investors about how banks can achieve certain costs advantages because of operational scale. For instance, through reaching more customers, a certain bank is in a better position to cover its fixed costs such as infrastructure, technology, and general administrative expenses. Also, Edeling & Himme (2018) mentioned that market share ratios critically define the pricing power of a bank and therefore financial performance as Pricing power is related to a bank's capacity to influence, change or determine the price levels of its financial services and products without affecting consumers' decisions to switch to other institutions. Finally, Rabbani, Lutfi, Ashraf, Nawaz, & Ahmad Watto (2023) linked greater market share to banks ability to offer competitive remuneration and finer employee benefits and training opportunities, which are essential to attract and retain human capital and build a sound work environment and organizational culture, which will increase firms' attractiveness to candidates.

Based on these studies the following hypothesis were developed:

H4: AI disclosure has a positive impact on the financial performance (measured by market share) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

1.5.1.3 Control variables (corporate governance)

Ouabouch & Yahyaoui (2025) defined corporate governance as the system of rules, practices, and processes by which companies are directed and controlled. This definition includes different aspects of board structure, transparency, shareholders rights and executive compensation among other mechanisms to ensure accountability and ethical business conduct. Kahyaoğlu (2021) stated that AI implementation in banks with sound corporate governance plays a vital role in mitigating risks and ensure that AI driven decision making is aligned with bank strategic objectives.

According to Li , Li, Wang, & Thatcher (2021) CEO duality occurs when the chief executive officer (CEO) and the chairman of the board of directors' positions are held by the same person. Such duality can have both positive and negative implications, on one hand, CEO duality could help to improve strategic decision making and operational

efficiency since it removes conflicts between executive management and board members helping banks to keep up with fast-changing technological environment. However, Pasban, Toosi, & Mazaheri (2023) claimed that CEO duality has a serious concern as to oversight and accountability because of power concentrating which could lead to biased decision making, reduced board independence, and weakened corporate governance practices.

Sushkova (2021) stated that the incorporation of women on banks board of directors is considered a positive impact on banks' ability to enhance both balanced decisions making and ethical corporate operations. Research by Montagnani & Passador (2022) based on gender role theory concluded that financial performance can be significantly improved due to women involvement in decision making because they usually have superior skills regarding risk monitoring disclosure commitment than men. However, Opponents to gender diversity such as Eskandarany (2024) pointed out that including women in banks boards would hypothetically result in appointing individuals for diversity goals rather than expertise-based qualifications leading to divert attention away from essential qualifications which results in sub-optimal governance performance.

Grove, Clouse, & Xu (2019) explain that holding regular board meetings can improve AI implementation due to better risk evaluation and AI strategy alignment with banks objectives with making necessary adjustment responding to marketplace changes. However, the purposeful utilization of meetings outlined by Kamalnath (2019) emphasizes that too many meetings decrease decision quality by generating fatigue and bureaucracy that prevents successful execution of AI and similar strategic approaches since board members who actively get involved with daily transaction tend to curtail executive freedom to make independent actions.

Larger boards are well-suited for complex banking environments, as their diverse expertise across areas such as finance and technology support more comprehensive and informed decision-making. A properly sized board conducts comprehensive examination of AI adoption to prevent risks stemming from cybersecurity threats and regulatory difficulties as well as ethical AI deployment concerns (Koskinen, 2023). However large board member sizes that exceed the optimal number result in performance issues because

of coordination problems along with delayed decisions and disputes of interest between directors. An excessive number of directors produces bureaucratic inefficiencies by requiring prolonged and fruitless discussions about AI policies which should instead lead to direct action (Hilb, 2020).

Binh & Pin-Yu (2024) measured bank size using different formulas like the amount of assets a bank own or control, the number of bank branches and the total revenue a bank generate within a year. Alam & Chowdhury (2021) stated that banks incur two types of costs during AI implementations starting with initial IT system development expenses and post implementation costs such as ongoing expenses for maintenance and enhancement, such expenses can affect banks overall financial health even after distributing these expenses appropriately across all operations which require technology-related handling techniques that varies between large and small banks because bigger institutions possess more financial capacity. In addition Naeem, Siraj, Abdali, & Mehboob (2024) referred to that larger banks' operations and risk management are more complicated due to managing diverse portfolios, meeting numerous regulations worldwide, and fulfilling numerous customer demands and such complexities can be handled using AI assistant by offering robust forecasting of customer behaviors and automatically checking compliance with regulations and standards.

Zhan, Xiong, Han, Lam, & Blome (2024) describe ownership concentration as an assessment tool for determining the impact of major shareholders on the process of decision making. Chiu & Lim (2021) concluded that the implementation of Artificial Intelligence technologies in bank institutions heavily depends on the influence that major stockholders exercise during adoption decisions because of Large shareholders have the voting rights to approve or reject AI initiatives after they evaluate how the approaches will affect business profitability alongside organizational expansion outlooks. In addition Hamza (2009) claimed that AI-driven strategies receive financial support from large shareholders because they aim to increase profitability while lowering business expenses through data analytics systems.

Debt ratio can be defined as an accounting index showing the percentage of organization total debt to the total asset, indicating the degree of bank activity financed through credit.

This ratio is considered as one of the most significant solvency and financial risk ratios as it gives the idea about the long-term financial stability of the bank (Sadok, Sakka, & El Maknouzi, 2022). Concerning the involvement of AI, the debt ratio is relevant when assessing bank's ability to fund the integration of AI since high debt ratios means that it is risky for the banks to incorporate AI due to the possibility of facing financial distress or bankruptcy, such cautiousness makes it difficult for banks to compete with competitors who are better placed to integrate AI technologies (Tellez Gaytan, et al., 2021).

1.6 Hypotheses related to artificial intelligence and financial performance

1.6.1 Resource-based view theory

The Resource-Based View (RBV) theory is a core theory of strategic management that holds that resources and capabilities are the main sources of a firm's competitive advantage and superior financial performance (Kero & Bogale, 2023). RBV changed the assumption that competitive advantage stems from external factors rather than from resources that are owned by the firm like physical and nonphysical assets and employee skills since these resources help banks develop specific strategies that cannot be imitated by rivals leading to creating sustainable competitive superiority.

Using and implementing AI as a strategic asset can be used to demonstrate how a bank can use this technology to improve its financial performance through machine learning, Natural language processing and other related technologies such as predictive analytics all have the characteristics of a valuable and unique resource (Moderno, Braz, & Nascimento, 2024). Thanks to AI analytical capabilities, banks manage to make accurate decisions to improve their product portfolios, pricing models, and risk controls. For example, the credit scoring models can be made more accurate through the help of AI algorithms by analyzing credit histories and market conditions and help in making better lending decisions and less credit losses would translate into better financial performance (Chen, Esperança, & Wang, 2022). Additionally, AI improves effectiveness in business processes by implementing smart automation in numerous workflows, including transactions, compliance reporting, and customer service interactions. In this way, the use of automation tools helps the banking sector to minimize the costs of certain operations (Ristyawan, 2020).

1.6.2 Technology Acceptance model

Technology Acceptance model (TAM) is a theoretical model introduced in 1989 by Fred Davis based on the previous psychological theories, including the Theory of Reasoned Action and the Theory of Planned Behaviour that tried to predict human behaviours in different decision-making situations to explain and estimate user's acceptance of technology (Chuttur, 2009).

according to Na, Heo, Han, Shin, & Roh (2022) Technology Acceptance model (TAM) offers a valuable framework for understanding the relationship between Artificial Intelligence (AI) and banks' financial performance by focusing on two primary factors which are perceived usefulness which measure the extent to which a user perceives AI to boost his/her performance at the workplace or in a specific task, and perceived ease of use since the likelihood of using AI tools is likely to be high if it don't need complicated training. Sohn & Kwon (2020) says this in a way helps to explore the AI functionality in different aspects of both employee and customers lives including such options as chatbots, virtual assistants, or online specialized financial planning which is beneficial in the aspects of comfort and responsiveness to a market changes

1.6.3 Transaction cost theory

Fredikind (2014) defined Transaction costs as "the costs that come with making an economic exchange in the form of searching for information, drawing up the contracts, assessing and monitoring the performance and finally enforcing the contracts". As highlighted by Martins, Serra, Leit, Ferreira, & Li (2010) this theory established by Ronald Coase in 1937 in his paper titled "The Nature of the Firm." and redesigned by Oliver Williamson during the 1970s and 1980s. Coase's suggestion was that organizations exist because they can accomplish some tasks more effectively internally than through the market with considerable cost, a research by Rindfleisch (2020) argues that transaction cost theory (TCT) concerns with analyzing the expenses involved in financial transactions including costs incurred in negotiation and managing contractual relationships.

Fai (1987) contended that transaction cost theory (TCT) is an ideal theoretical lens to use in dissecting the interaction between AI and the growth of banking industry financial

performances due to the direct and indirect reduction of transaction costs. According to Chen, Tu, & Zeng (2024) AI reduce transaction costs by eliminating time-consuming processes. For example, computations and pattern analyses can be done swiftly and with exceptional accuracy through utilization of AI algorithms, thereby reducing the amount of time spent on data entry and data analysis which also reduce labor expenditure while at the same time enhancing the accuracy of the work and the general performance of operations,

Moreover Budhwar, et al. (2023) suggest that AI enables efficient handling of transaction processing, compliance reporting, and frequently asked questions in customer services while conserving resources with these processes being made automated, banks are therefore able to free human resources to engage in more complicated tasks that can add value to the bank. In addition Ananyi & Somieari-Pepple (2023) came to the conclusion that AI has the potential to contribute in lowering transaction costs through increasing the transparency and the reliability of the overall banking industry by improving the monitoring and reporting of transactions so that banks can comply with legal requirements which in turn reduce the possibility to incur any fines.

1.6.4 Agency theory

Among microeconomic theories, Agency Theory evolved in the early twentieth century but came into limelight after the pioneering works of Michael Jensen and William Meckling in the early seventies. stands out as one of the most important theories of the business world (Zogning, 2017). This theory focuses on the conflict between self-interests of principals (owners) and the self-interests of agents (managers) within the firms by focusing on observing the effects and problems arise from the separation between the ownership and control of firms. Smith stated that managers who are not the owners sometimes tend to control the company in a way that is not in the best interest of the shareholders (Kang & Lou, 2022).

AI can play a critical role regarding minimizing agency costs which include monitoring, bonding and residual loss costs. The need to supervise managers to make sure that they pursue the shareholders' goals and objectives create the Monitoring costs, bonding costs can be described as all the costs incurred to align managers and the shareholders' interests

usually through using incentives. The last type of loss is the residual loss, which is consequent when, despite monitoring and bonding, a divergent interest remains (Daqar & Smoudy, 2019). In addition AI can greatly contribute to the reduction of these costs, by improving the process of monitoring and automation since it is quite difficult for managers to manipulate financial figures when AI systems can monitor the flow of financial transactions, operation metrics, and compliance activities in real time and promptly alert the board of any signs that could suggest managerial wrongdoing or inefficiency (Vanneste & Puranam, 2024). Also AI can identify proper performance measures that are more appropriate in evaluating the performance of managers exceeding the traditional performance indicators such as the net income or gross margin to other measures like stakeholder satisfaction, risks management and the development of new products and services, therefore by integrating such performance measures into reward systems managers can be encouraged to work towards enhancing the value of the shareholders (Schweyer, 2018).

1.6.5 Contingency theory

This theory was developed in the 1960s & 1970 s by Lawrence and Lorsch and supported by the presumption on differentiation posture where it is believed that performance is a function of the similarities and differences between the organization and its environment (Amghar, 2022). According to Hu & Wu (2023) contingency theory is one of the well-developed theories in organizational studies and management, which has postulated the absence of specific universal prescriptions for the structure and management of organizations since the best course of action depends on the context of the organization's environment.

In banking context AI helps improve banks' performance by aiding them in aligning management goals with the current market conditions since applying AI in banks enables them to gain detailed information about clients whenever they want, hence making more appropriate and flexible decisions (Chatterjee, Mikalef, Khorana, & Kizgin, 2024). Such access to detailed information is very vital especially in the current volatile economic environment, to speed up decision making by delegate decision making to lower-level managers as information and tools that were only available to senior managers are now in their hands (Abedin, 2022). This supports the view held by many people that the use

of management strategies and approaches should be determined by the external environment. Consequently, the incorporation of AI in banking ventures is not only advantageous from the formulation of the bank's perspective in terms of satisfying clients as well as increasing its own revenues but also makes it easier for the bank to gauge these enterprises as they have the potential to thrive in a dynamic society (Abedin, 2022).

1.6.6 Information system success model

According to Varajão, Lourenço, & Gomes (2022) The Information System Success Model (ISSM) was first proposed by DeLone and McLean in 1992 with some modifications in 2003 and is deemed as the most integrated model to measure the IS success. The ISSM delineates six key dimensions four of the are included in communication systems which are system quality, information quality, service quality and system use, while the other two are created from the clients' perception which are user satisfaction and net benefits. These dimensions in their joint context present a sound paradigm for measuring the efficiency and utility of IS on firm performance (Al-Kofahi, Hassan, Mohamad, Intan, & Com, 2020).

Introducing AI technology in the banking sector greatly increases the degree to which financial information possesses desirable qualitative features with respect to both fundamental and enhancing qualities. Such advancements are crucial in various aspects such as decision-making processes, compliance with regulatory requirements, managing risks, and improvement of operations in banking and other financial organizations (Collins, Dennehy, Conboy, & Mikalef, 2021).

The use of AI In banks can for sure make financial and nonfinancial information more relevant and reliable because of AI capability to analyze large amounts of data in real time which implies that banks can collect up to date information and use them to provide customers with financial advice and product recommendations (Torrentira, 2024). In addition, by preventing human interactions in the decision-making process for repetitive tasks, bias is significantly eliminated. In addition, by experimenting over cross-sectional data, AI systems can learn new patterns and incorporate them into a growing set of patterns to offer the best information required at any certain point in time which results in increasing the accuracy of AI algorithms to a level at which they are free from error or

bias (Marjanovic, Mester, & Milic Marjanovic, 2021). Also, Financial information comparability and consistency within the bank sector can be significantly enhanced through using AI technology since a more accurate comparing process can be achieved through the automation of data collection and presenting data in a coherent format. This uniformity makes benchmarking and trend analysis become more accurate and easier to understand (Naidoo, 2023). Finally, information understandability can be improved since AI based tools like chatbots and virtual assistants are self-explanatory and allow customers and employees of the bank to navigate and read complex financial data instantly (Vuckovic, et al., 2023).

Chapter Two
Research Methodology

2.1 Introduction

The research examines the impact of AI disclosure on the financial performance of banks listed at the Palestine Exchange and Amman Stock Exchange from 2015 to 2023 and the reason why I choose this period specifically is because it captures the timeframe during which AI began to move from experimental use to practical adoption in the banking sector, both globally and in emerging markets such as Palestine and Jordan. From 2015 onward, banks in the region started to integrate digital technologies, upgrade infrastructure, and gradually disclose AI-related practices in their reports. Also sufficient financial data across multiple years became available, allowing for meaningful longitudinal analysis of how AI disclosure relates to financial performance. In this chapter, I will discuss the study population and sample, determine the sources for required data, and discuss the study's variables and their measurements.

2.2 Data collection method

This study will rely on two types of data sources; the first one is the secondary sources, by reviewing previous research and studies that talk about the concept of artificial intelligence and how banks exploit artificial intelligence to improve their financial performance, which can be measured in several ways according to previous studies. Also, it will rely on preliminary data sources such as financial reports that can be obtained from banks' websites or reports published on both the Palestine and Amman Stock Exchanges.

2.3 The study population and sample

This study considers a population comprised of the commercial banks listed at the Palestine Exchange (PEX) and Amman Stock Exchange (ASE) during the period 2015–2023, which numbered 4 banks for the PEX and 12 banks for ASE; all banks were included if the data required to measure study variables was available for the study period. As a result, all four banks from PEX and only a 11 banks from ASE were included in the study sample due to the lack of sufficient disclosure for Al-Etihad Bank in ASE; also, all Islamic banks were excluded from the study sample since these banks' operations are based on Islamic teachings that prohibit dealing with interest, and thus the inability to

measure some variables related to measuring the financial performance of banks such as net interest margin.

Table No. 1 shows the names of the banks included in the study, their trading codes, and the stock exchanges on which they are listed.

Table 1

Study sample of listed commercial banks

Bank name	Trading code	Stock exchange
Palestine bank	BOP	Palestine exchange
Palestine Investment Bank	PIBC	Palestine exchange
Al-Quds Bank	QUDS	Palestine exchange
National Bank	TNB	Palestine exchange
Jordan Kuwait Bank	JOKB	Amman stock exchange
Jordan Commercial Bank	JCBK	Amman stock exchange
Housing Bank for Trade and Finance	THBK	Amman stock exchange
Arab Jordan Investment Bank	AJIB	Amman stock exchange
Arab Banking Corporation Bank/Jordan	ABCO	Amman stock exchange
Investment bank	INVB	Amman stock exchange
capital Bank of Jordan	CAPL	Amman stock exchange
Cairo Amman Bank	CABK	Amman stock exchange
Bank of Jordan	BOJX	Amman stock exchange
JORDAN AHLI BANK	AHLI	Amman stock exchange
Arab Bank	ARBK	Amman stock exchange

2.4 Definition of Variables and Indicators

2.4.1 Independent variable (AI disclosure score)

After reading previous studies, we can find that researchers have measured artificial intelligence disclosure in several ways; for example, Rahman, Ming, Baigh, & Sarker (2023) used both qualitative and quantitative methodologies to measure AI disclosure. The qualitative aspect involved interviews with banking customers to gather insights into their perceptions and attitudes toward AI in banking while quantitative aspect was conducted using surveys, where data were collected from a broader sample of banking

customers; the collected data were then analyzed using Smart PLS 3.0 software, a tool commonly used for Partial Least Squares Structural Equation Modeling (PLS-SEM). The analysis focused on identifying key factors such as perceived usefulness, perceived risk, trust, and subjective norms, which were found to influence the intention to adopt AI in banking services significantly

Sabharwal (2014) employed structured interviews and GAP analysis to measure AI adoption. Structured interviews were conducted with key stakeholders in the banks, including IT managers, to gather information on the current state of AI technology usage. The GAP analysis was then used to compare the current state of AI adoption against a desired or optimal state of AI implementation. This comparison helped to identify the shortfalls in AI adoption and the areas where improvement was needed.

Ryzhkova, Soboleva, Sazonova, & Chikov (2020) used surveys as the primary tool for measuring perceptions of AI. These surveys were distributed among banks employees to gauge their views on AI's role within the bank, its impact on operations, and its overall effectiveness. Additionally, the study gathered data on the level of AI investments and the returns these investments generated. This financial data helped quantify AI's tangible benefits, such as cost savings and efficiency improvements. The study also categorized Russian banks based on their AI and machine learning implementation level, providing a comparative analysis of AI usage across different institutions.

Shiyyab, Alzoubi, Obidat, & Alshurafat (2023) measured the AI variable by conducting a content analysis of AI-related disclosures in the annual reports of 15 Jordanian banks from 2014 to 2021. It identified AI-related keywords, counted their frequency, and analysed their context using specialised software to create an AI disclosure index. This index quantified the extent of AI adoption and correlated with financial performance metrics like ROA, ROE, and total expenses. The analysis aimed to assess the impact of AI on the financial performance of Jordanian banks, revealing that higher AI disclosure was associated with improved financial outcomes.

In this study I will use content analysis to measure AI adaptation using a checklist since it provides a standardised and systematic approach to assessing AI disclosure across different organisations. A checklist ensures that all relevant aspects of AI adoption, such

as infrastructure, applications and governance, are consistently evaluated, reducing subjectivity and human error and allows for easy comparison across organisations or periods and ensures no critical factors are overlooked. A checklist can also generate the most accurate results by focusing on specific, predefined criteria, offering clear insights into the extent and effectiveness of AI adaptation.

The level of AI disclosure in this study will be measured by using a checklist consisting of 8 sections as shown in Table No .2 Which has been developed based on a group of global guidelines such as ISO/IEC 27001 and 27701, ISO/IEC JTC 1/SC 42, the national institute of standards and technology (NIST) and the organization for Economic Co-operation and Development (OECD).

if these items were disclosed in the annual reports of commercial banks listed in `PEX and ASE, a value of 1 will be given; otherwise, 0 value will be assigned, and the AI disclosure score will be calculated using the formula below:

AI = ∑ Score (Regulatory Compliance Enhancement, Decision Making Support, Risk Assessment and Mitigation, Customer Service and Financial Services Personalization, Fraud Detection, Process Automation, Human Capital Management, Communication and Transparency with Shareholders) / 34.

Table 2

AI disclosure checklist

Section	Assigned value
Regulatory Compliance Enhancement	
AI tools continuously monitor compliance with regulations.	
AI ensures adherence to internal policies and regulatory standards.	
AI assessing compliance-related risks	
AI-driven training programs for staff on regulatory changes.	
AI to anticipate and prepare for future regulatory changes.	
Decision-Making Support	
AI tools used in analyzing large datasets to support decisions	
AI forecasting market trends and financial outcomes	
AI simulates various business scenarios.	
AI predicting future sales based on historical data	
AI long-term strategic planning and decision-making	
Risk Assessment and Mitigation	
AI will develop and refine credit scoring models.	
AI for real-time assessment of customer creditworthiness.	
AI for monitoring and detecting cyber threats	
AI to identify and address system vulnerabilities.	
Customer Service and Financial Services Personalization	
AI-driven chatbots for customer support	
AI personalized financial planning and management.	
AI systems offer round-the-clock customer service.	
AI segmenting customers based on behavior and preferences.	
Fraud Detection	
AI to identify unusual patterns and behaviors	
AI for predicting potential fraud activities	
AI for verifying customer identities	
Process Automation	
AI for automating document handling and processing.	
AI for automating the loan approval process	
AI to automate account management tasks.	
AI to automate regulatory reporting.	
AI to automate data entry and reduce errors.	
Human Capital Management	
AI for identifying and acquiring top talent	
AI-driven performance evaluation systems	
AI for personalized employee training programs	
AI for optimizing compensation strategies	
Communication and Transparency with Shareholders	
AI is used to generate detailed financial and operational reports.	
AI for providing regular updates to shareholders.	
AI-powered platforms for virtual shareholder meetings.	
AI for enhancing transparency in communications with shareholders.	

Source: (Tursunbayeva & Gal, 2024; Shiyyab, Alzoubi, Obidat, & Alshurafat, 2023; Agarwal & Agarwal, 2022).

2.4.2 Dependent variables (Financial Performance)

This study will measure commercial bank financial performance by using 4 different variables which were carefully selected to cover all aspects of the bank's financial performance:

1. Return on asset:

This ratio covers the profitability concept of financial performance and is measured by dividing the bank's net income by the average total assets, according to (Singh, 2023).

ROA = bank net income/ (bank total asset for year x + bank total asset for year x-1)/2

2. Return of equity:

This ratio covers the shareholder value concept of financial performance and is measured by dividing bank net income by the total shareholder equity according to (Ahsan, 2012).

ROE bank net income/ total shareholder equity.

3. Net Interest Margin:

This ratio covers the operational efficiency concept of financial performance and is measured by dividing net interest income by average earning assets, which are defined as any asset that directly generates income which in banks' case earning assets can be considered as loans and any other form of credit that bear interest rates such as Loans and Leases, Investments in Securities like government bonds, corporate bonds, and other financial instruments that yield interest and other Interest-Earning Assets like deposits with other banks, interest-bearing balances (Desiderio, Magagnin, Kalinin, & Döttling, 2019).

NIM = interest income – interest expense/ (bank total earning asset for year x + bank total earning asset for year x-1)/2

4. Market share:

This ratio covers the competitive position concept of financial performance and is measured by dividing the bank's total revenue by the banking sector's total revenue (Genchev, 2012).

MS= bank total revenue/banking sector total revenue.

2.4.3 Control variables (Corporate governance)

1. Bank size: the natural logarithm of the bank's total assets.
2. Ownership concentration: The percentage of large shareholders who own more than 5% of total shares.
3. Board size: The natural log of the number of board directors.
4. Debt ratio: long-term debt to total assets.
5. CEO duality: whether the CEO is also a board member
6. Gender diversity: the number of women in board of directors to total board members
7. Number of board of directors meeting: The number of meetings held by the board of directors within a year

Table 3

Study variables

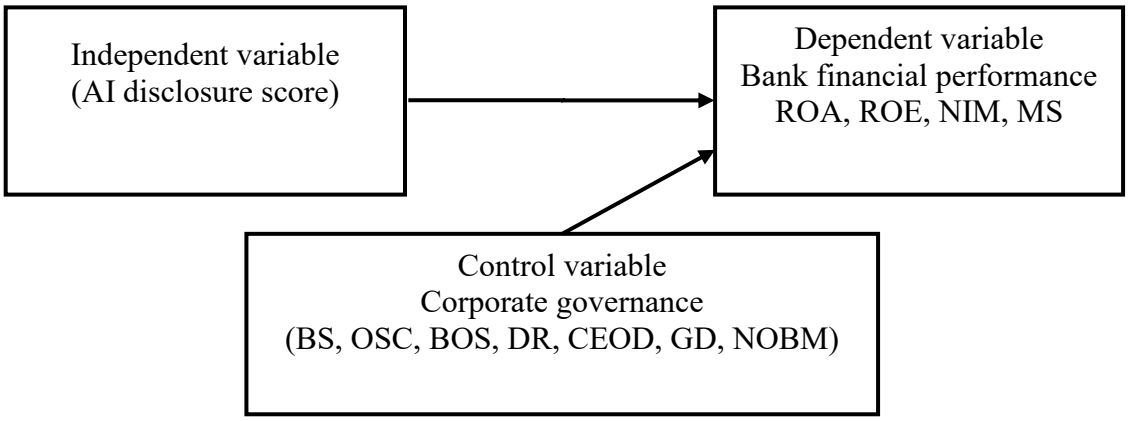
Variable type	Variable name	Variable code	Measurement	Reference
Independent variable	Artificial intelligence	AI	If the item disclosed in the annual report has a value of 1 assigned to the item, a value of 0 assigned	(Shiyyab et al., 2023)
Dependent variables	Return on asset	ROA	bank net income/ bank average total asset	(Singh, 2023)
	Return on equity	ROE	bank net income/ total average shareholder equity	(Ahsan, 2012)
	Net interest margin	NIM	Net interest income/ bank average earning asset	(Desiderio et al., 2019)
	Market share	MS	Bank revenue/ banking sector revenue	(Genchev, 2012)
control variables	bank size	BS	the natural logarithm of bank total asset	(Alam et al., 2021)
	Ownership concentration	OSC	The percentage of large shareholders who own more than 5% of total shares	(Shiyyab et al., 2023)
	board size	BOS	The natural logarithm of the number of board directors.	(Fernandes et al., 2018)
	Long term debt ratio	DR	long term debt to total asset	(Tellez, 2022)
	CEO duality	CEOD	1 if the CEO is also a board member 0 if not	(Li et al., 2021)
	Gender diversity	GD	Number of women in board of directors divided by the total number of board of directors	(Sushkova, 2021)
	Number of board meetings	NOBM	The number of meetings held by the board of directors with a year	(grove et al., 2019)

2.5 Conceptual model of the study

Based on previous research that studied the relationship between AI disclosure and banks' financial performance, this model was formulated by the researcher to describe the impact of AI disclosure on the bank financial performance:

Figure 1

Conceptual model of the study



2.6 regression model

$$Y_{i,t} = \beta_0 + \beta_1 AI_{i,t} + \beta_2 BOS_{i,t} + \beta_3 CEOD_{i,t} + \beta_4 GD_{i,t} + \beta_5 OSC_{i,t} + \beta_6 BS_{i,t} + \beta_7 DR_{i,t} + \beta_8 NOBM_{I,t} + \epsilon_{i,t}$$

Where $Y_{i,t}$ is bank financial performance. $AI_{i,t}$ is the AI disclosure score. $BOS_{i,t}$ is the The natural logarithm of board members. $CEOD_{i,t}$ is a binary variable (1 if the CEO is also the chairman, 0 otherwise). $GD_{i,t}$ IS the proportion of female board members. $OSC_{i,t}$ is the percentage of shares held by major shareholders who own more than 5% of total shares. $BS_{i,t}$ is the natural logarithm of total assets. $DR_{i,t}$ is the ratio of long-term debt to total assets. NOBM is the total number of board of directors' meetings during a year. β_0 is the intercept. $\beta_1, \beta_2, ..., \beta_7$ are the regression coefficients.$\epsilon_{i,t}$ is the error term.

2.7 Statistical Analysis Methods

The research examined the impact of AI disclosure score and commercial banks financial results through various statistical data analysis techniques. To measure relationships and strengths between artificial intelligence disclosure and financial performance indicators (ROA, ROE, NIM, and market share) correlation analysis was applied while multiple linear regression models were used to analyze the direct effects of AI disclosure on these

results. This examination used extended regression analysis that incorporated corporate governance variables to determine institutional effects to achieve a deeper understanding of institutional effects. The summary analysis and observation of trends were conducted through descriptive statistics after using methodological frameworks from (Shiyyab, Alzoubi, Obidat, & Alshurafat, 2023) and Kaddumi, Baker, Nassar, & A-Kilani (2023) in the research.

Chapter Three

Results

This chapter summarizes the findings of the statistical analysis performed to test the relationship between artificial intelligence (AI) disclosure and the commercial banks financial performance of Palestine and Amman Stock Exchanges between 2015-2023. The descriptive statistics will be used to give a summary of the variables in the study, and correlational analysis will be used to examine the correlation between the variables. Lastly, regression models are used to test the hypotheses of the research and assess direct and indirect impacts of AI disclosure on financial performance when corporate governing variables are taken into account. The results of this chapter are the empirical basis of the discussion and conclusions made in the next chapter.

Table 4

Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
ROA	135	0.01	0.005	-0.002	0.019
ROE	135	0.079	0.039	-0.01	0.193
Net Interest Margin	135	0.058	0.013	0.022	0.086
Market Share	135	0.112	0.137	0.009	0.515
AI disclosure score	135	0.536	0.235	0.045	0.861
Board Size	135	2.463	0.131	2.079	2.773
CEO duality	135	0.163	0.371	0	1
Gender diversity	135	0.091	.095	0	0.455
Number of board meetings	135	7.778	2.442	5	19
Ownership Concentration	135	0.569	0.27	0.054	0.961
Bank Size	135	21.775	1.186	19.333	24.547
Long Term Debt Ratio	135	0.338	0.129	0.005	0.606

This table presents the descriptive statistics, which provide an overall description about the key financial performance indicators, corporate governance characteristics, and the AI disclosure scores of 15 commercial banks listed on Palestine and Amman Stock Exchanges during the 2015-2023 period, which is a total of 135 observations.

ROA has a mean of 0.01 meaning that, on average, banks generate 1 percent profit per unit of assets held. The variation in the banks as measured by the standard deviation is between 0.005, which is moderate, and there were instances of negative ROA (minimum -0.002), and highest ROA (0.019) indicating the well performing banks. The average of ROE is 7.9%, there's a big variation (standard deviation of 0.039) across banks. For example, some banks can have negative equity returns (-0.01) and others up to 19.3% meaning that there is significant differences between their financial performance. But Net Interest Margin (NIM) averages 5.8% with a small, standardized deviation (0.013) which

means it's been consistent for all of them in terms of the spread between interest earned and paid. On the other hand, Market Share has very significant volatility with an average of 11.2% but a standard deviation of 13.7%, meaning that while some banks have a dominant market position, others are much less present in their respective markets. At the sample, the most dominant bank capture 51.5 per cent of market share, whereas the smallest only captures a mere 0.9 per cent.

The average AI disclosure score is 0.536, meaning banks on average disclose only about 53.6% for all the activities related to AI. Nevertheless, the high standard deviation (0.235) does reveal large differences in transparency, making some banks extremely reluctant to mention or disclose their AI initiatives (4.5%) and others quite proactive (86.1%). This variation could be attributed to differences in ways of adopting technology, regulatory requirements, or institutional policies concerning the openness of AI.

Concerning corporate governance factors, Board Size is rather low in variation with mean of 2.463 (log transformed) and values between 2.079 and 2.773. This implies that management boards of most banks usually have similar governance structures, which tend to keep their compositions stable. The average of CEO Duality is 0.163 which means the CEO will serve as the chairman in 16.3% of cases and separately in the other 83.7%. It does not fit with good corporate governance practice to allow the CEO to serve as a board chairman since it limits accountability. Notably, even though Gender Diversity forms an important aspect, the representation of women on the boards is at 9.1%. There are no female board members at some banks, while the most progressive banks have up to 45.5% of female representation. The Mean and Median of the Number of Board Meetings per year ranges widely (from 5 meetings to 19 meetings per year) with an average of 7.778 meetings, indicating different degrees of governance participation.

ownership concentration averages 56.9%, which implies that in most banking institutions, a small group of shareholders own over half of the total shares and this variable has a very scatter range meaning some banks exhibit extremely scattered ownership (5.4%) and some very high concentrated (96.1%). Based on this variation, the level of shareholder influence on decision making processes are different. At the same time, Bank Size, represented by the natural logarithm of total assets, experiences only moderate variation, with an average of 21.775 and standard deviation of 1.186, but also shows that there are significantly larger banks than others. Finally, the Long-Term Debt Ratio, which is the ratio of total assets financed by long term debt and it has mean of 33.8 % and min –max is 0.5 % – 60.6 % so some banks rely heavily on long term debt and others have more conservative debt structure.

Table 5

Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) ROA	1.000											
(2) ROE	0.758	1.000										
(3) Net Interest Margin	0.358	0.018	1.000									
(4) Market Share	-0.006	0.135	-0.335	1.000								
(5) AI Disclosure score	0.398	0.240	0.168	0.329	1.000							
(6) Board Size	0.029	-0.044	0.233	-0.313	-0.269	1.000						
(7) CEO duality	0.098	0.328	0.005	0.434	0.265	-0.160	1.000					
(8) gender diversity	-0.192	0.179	-0.363	0.317	-0.015	0.034	0.319	1.000				
(9) number of board meetings	0.030	0.082	0.047	-0.112	-0.396	0.198	-0.075	0.251	1.000			
(10) Owner ship Concentration	-0.162	-0.257	0.035	-0.507	-0.180	-0.003	-0.429	-0.319	-0.088	1.000		
(11) Bank Size	-0.007	-0.083	-0.205	0.513	0.098	-0.023	-0.169	-0.060	-0.008	-0.149	1.000	
(12) Long Term Debt Ratio	-0.002	-0.067	-0.032	-0.454	-0.459	0.365	-0.436	-0.054	0.378	0.066	0.038	1.000

The correlation matrix results specify how the dependent and independent variables interact with each other to determine whether collinearity problem exist or not. In the above results, there are no high correlation results that can cause collinearity problem.

We can find strong positive correlation (0.758) between ROA and ROE implying that banking institutions which work out efficiently and make better profits also pay off greater dividends to their shareholders. There is a moderate positive correlation between ROA and NIM (0.358) showing that banks with higher interest margin bank tend to be more profitable with loaning activities implying better overall profitability on its assets. There is almost no correlation between ROA and Market Share (-0.006) meaning that having a high Market Share does not automatically guarantee high asset profitability. A moderate positive correlation (0.398) is found between AI Disclosure and ROA, indicates that the more transparent banks regarding their adoption of AI can generate more profit on their assets. Moving to corporate governance its noticed that all variables have either weak positive or weak negative correlation with ROA meaning that implementing corporate governance practices doesn't enhance banks assets profitability.

The weak positive correlation between ROE and NIM (0.018) doesn't imply that higher NIM lead to higher ROE because operating costs, capital structure, and non-interest income also have a significant contribution to equity. The weak positive correlation (0.135) between Market Share and ROE implies that banks with larger market share are subject to slightly better shareholder returns and enhancing through economies of scale in terms of efficiency and cost control. A moderate positive correlation (0.240) between AI Disclosure and ROE may suggests that transparent policies about disclosing AI can increase shareholder returns due to improved efficiency, automation and better risk management practices. Looking at corporate governance variables we can notice that most of them have a weak correlation with ROE meaning shareholders wealth doesn't improved due to the implementation of corporate practices.

moderate negative correlation between NIM and market share (-0.335) indicates that banks with higher market share have smaller net interest margins because they diversify their revenue sources away from traditional lending activities towards other non-interest income. Furthermore, weak positive correlation between AI and NIM (0.168) suggests

that an improvement in net interest margin could result from AI adoption by improving credit risk assessment and loan pricing strategy optimization. Regarding corporate governance correlation analysis show that NIM has weak but stable relationships with corporate governance variables, board size demonstrates a modest positive link with NIM while CEO duality, ownership concentration and number of board meeting have a very weak positive correlation with NIM, On the contrary long-term debt ratio, bank size and gender diversity have a negative correlation with NIM, these patterns suggest governance factors have varying, mostly modest influences on bank financing activities profitability.

Finally, the moderate positive correlation (0.329) between AI and Market Share implies that banks that have a stronger market position tend to disclose more information related to AI since banks with higher market share tend to inform investors about their competitive advantages that can be created through AI technologies to ensure them that their investment are safe and growing. Moving to corporate governance variables some of them have a strong correlation with AI disclosure like CEO duality and bank size with a strong positive correlation while ownership concentration and long term debt have a strong negative correlation. On the other hand board size show a moderate negative correlation with AI disclosure while gender diversity have a positive one. Lastly number of board meetings show a weak negative correlation with AI disclosure. Such variety suggests that certain governance practices influence how proactive or transparent banks are with emerging technologies like.

Table 6

Regression analysis

VARIABLES	(1) ROA	(2) ROA	(3) ROA
AI disclosure score	0.0106***	0.0109***	0.0106***
	(0.00172)	(0.00150)	(0.00154)
Board size	0.00320	0.00537**	0.00451**
	(0.00277)	(0.00255)	(0.00272)
CEO duality	-0.00102	-0.000747	-0.00106
	(0.00119)	(0.00106)	(0.00111)
Gender diversity	-0.0150***	-0.0144***	-0.0130***
	(0.00395)	(0.00350)	(0.00386)
Number of board meetings	0.000452***	0.000469***	0.000437***
	(0.000161)	(0.000142)	(0.000146)
Ownership concentration	-0.00217	-0.00206	-0.00209*
	(0.00148)	(0.00130)	(0.00130)
Bank size	-0.000331	-0.000257	-0.000466
	(0.000299)	(0.000263)	(0.000349)
Long term debt ratio	0.00548	0.00446	0.00268
	(0.00340)	(0.00304)	(0.00361)
Year *fe*	No	Yes	Yes
Country *fe*	No	No	Yes
Constant	0.000577	-0.00455	0.00190
	(0.00991)	(0.00878)	(0.0113)
Observations	135	135	135
R-squared	0.318	0.512	0.516

Robust Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As presented in table 6 R- square value is 0.516 meaning that 51.6% of variations in ROA can be explained by AI in this mode. Also, AI disclosure score has a positive and highly significant effect on ROA in all their models (Model 1: 0.0106, Model 2: 0.0109, Model 3: 0.0106, $p < 0.01$) these results are consistent with the moderate positive correlation (0.398) between AI disclosure and ROA, indicating that greater AI disclosure leads to more profitability. Since the correlation matrix indicates that high AI disclosure banks are associated with better operational efficiency, risk management and financial performance, this argument is supported, in addition The consistency of the AI disclosure

coefficient across models indicates the robustness of the effect after controlling country and time variation. This also aligns with a broader literature documenting that AI represents transformative changes to the banking industry, especially in increasing profitability by means of well optimized operations and data oriented decisions. Additionally, the positive coefficient is consistent with the theory of strategic management that states that the technological innovation serves as a source of competitive advantage and financial growth.

Several studies have supported this result such as, Shiyyab, Alzoubi, Obidat, & Alshurafat (2023) who highlighted that AI adoption enhance banks capability for risk assessment thereby reducing loan default rates and improving the credit quality of the bank thus positively influencing profitability. Similarly, Hameed (2022) noted that banks that use AI driven analytics have a better asset allocation and cost optimization practices leading to improving ROA. Moreover, Sinițîn & Socol (2021) note that AI automation of banking operations and daily transaction helped customers services departments in creating a customized financial services and product to meet the unique desires for each customers clusters and build customer loyalty and increase revenue. Rahman, Ming, Baigh, & Sarker (2023) provide further proof that in Middle Eastern banks, AI transparency enhances investors' confidence in banks annual reports credibility which improves the financial stability as well as profitability. Cantero-Saiz, Polizzi, & Scannella (2024) concluded that AI enables real time financial monitoring thereby reducing the risks of fraud and operational losses, which eventually enhance the bank's performance.

In his study, Singh (2023) noted that AI driven predictive analytics help optimize investment portfolio and contributing to the long term profitability. Additionally, Lin et al. (2023) asserted that the adoption of AI helps banks with cost saving through automating compliance and cost analysis reports preparation, thereby improving bake financial sustainability. In short these studies confirm that AI disclosure have a significant impact on banks financial performance through efficiency, transparency and strategic decisions making enhancement.

In Models 2 and 3, the coefficient of board size is significant and positive (0.00537 and 0.00451, $p<0.05$), while it becomes insignificant in Model 1(0.00320) this result is aligned with the correlation coefficient (0.029) between board size and ROA in the correlation matrix, While larger boards could potentially help oversee business and strategically, Kaddumi, Baker, Nassar, & A-Kilani (2023) argue that an overly large board will significantly slow decision processing, and hence it will be an inefficient setup. Looking at CEO duality we can see a small but statistically insignificant regression in all models (-0.00102, -0.000747, -0.00106), this result agree with Pasban, Toosi, & Mazaheri (2023) study which concluded that CEO duality don't affect banks financial performance.

A strong negative effect of gender diversity on ROA is found for all models (Model 1: -0.0150, Model 2: -0.0144, Model 3: -0.0130, $p<0.01$) which corresponds to the negative correlation (-0.192) with ROA. While this result differs from Hameed (2022) who argued that diverse leadership improves decision making, it may reflect the inherent challenges of fully embedding women's gender diversity in a grounded strategic role within the banking sector as mentioned by kskandarany.(2024) who said that complying with gender diversity would hypothetically result in appointing individuals for diversity goals rather than expertise-based qualifications.

Board meeting frequency has a small but significant positive impact on ROA, (Model 1: 0.000452, Model 2: 0.000469 and Model 3: 0.000437) which aligned with correlation result (0.03) this comply with Grove, Clouse, & Xu (2019) findings which suggested that more frequent board meetings can result in a better AI disclosure since this process will be overseen by boards members whom can discuss new risks and respond faster to market changes. Ownership concentration has a negative effect on ROA in all models (-0.00217, -0.00206, -0.00209) alongside with a (-0.162) correlation meaning ownership concentration lead to lower ROA, this result can be supported using studies like Zhan, Xiong, Han, Lam, & Blome (2024) which concluded that high concentration of equity can lead to risk hedging policies which in turn minimize profit margins over time.

In addition, across all models, there is a negative but statistically insignificant effect of bank size on ROA (-0.000331 -0.000257 -0.000466), this is in line with its near zero correlation (-0.007) with ROA. Hence, it is implied that invariably bigger banks are not

relatively better off from the profitability perspective, possibly because of higher complexities in operational activities and cost inefficiencies. Furthermore, according to Kaddumi, Baker, Nassar, & A-Kilani (2023), large banks, on the one hand, enjoy economies of scale but, on the other subject to more regulation, which may constrain any ROA rise. Likewise, the long-term debt ratio exhibits positive but marginally insignificant effect which is around 0.00268 to 0.00548 on the ROA. Financial leverage as indicated by the correlation matrix shows no correlation to ROA (-0.002), thus it does not have enough strength to affect profitability. Further, Hameed (2022) states that by heavy reliance on debt financing, financial flexibility is constrained and could therefore constrain profitability gains in the long run.

Based on these results we can accept the first hypotheses:

H1: AI disclosure has a positive impact on the financial performance (measured by ROA) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

Table 7

Further analysis robustness check (ROE)

VARIABLES	ROE
AI disclosure score	0.0489***
	(0.0152)
Board size	0.0129*
	(0.0269)
CEO duality	-0.0234**
	(0.0110)
Gender diversity	-0.00113
	(0.0382)
Number of board meetings	0.00285*
	(0.00145)
Ownership concentration	-0.0129
	(0.0129)
Bank size	-0.000943
	(0.00346)
Long term debt ratio	0.0457
	(0.0358)
Year *fe*	Yes
Country *fe*	Yes
Constant	0.0206
	(0.112)
Observations	135
R-squared	0.341

In order to support my findings regarding regression analysis between AI disclosure and bank financial performance (measured by ROA) I used other variables to measure bank financial performance such as return on equity, net interest margin and market share.

As shown in table 7 after controlling country and time variation 34.1 % of variations in ROE can be explained by AI in this model. The coefficient estimated by the regression indicates that AI disclosure has a high significant positive effect on ROE by 0.0489 ($p < 0.01$). Consequently, there is an incremental increase in the return on equity of 0.0489 for each unit increase in AI disclosure. The correlation analysis is in line with this result as it shows a moderate positive correlation between AI disclosure and ROE (0.240).

Many previous studies can be relied on to explain this result such as sharma (2023) who stated that by implementing AI banks can achieve higher ROE due to operational efficiency, reduces costs and improves profitability. In addition, Abuhasan & Moreb (2021) concluded that AI implementation in decision making improves risk management for banks and enhance capital allocation optimisation which in turn improve return on equity. Also, Losbichler & Lehner (2021) mentioned AI enable banks to offer Tailor-made product and advertise its services in ways that differentiate them from competitors which in result help creating a competitive advantage over other competitors. Walton (2018) said that AI helps in the detection of fraud and facilitates compliance with regulations and laws thereby reducing the possibility of incurring fines.

Based on these results we can accept the second hypotheses:

H2: AI disclosure has a positive impact on the financial performance (measured by ROE) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

Table 8

Further analysis robustness check (NIM)

VARIABLES	Net Interest Margin
AI disclosure score	0.0138***
	(0.00414)
Board size	0.0320***
	(0.00734)
CEO duality	-0.00268*
	(0.00300)
Gender diversity	-0.0480***
	(0.0104)
Number of board meetings	0.000960**
	(0.000393)
Ownership concentration	-0.00417
	(0.00352)
Bank size	-0.00521***
	(0.000942)
Long term debt ratio	-0.0382***
	(0.00974)
Year *fe*	Yes
Country *fe*	Yes
Constant	0.0928***
	(0.0305)
Observations	135
R-squared	0.562

Moreover, the regression coefficient of the AI disclosure on NIM is positive and highly significant (0.0138, $p < 0.01$), indicating that AI can explain 56.2% of variation in NIM and when AI increase by one-unit NIM will response by increasing by 0.0138, this result cross pond the correlation matrix results as a positive correlation (0.168) between the two variables presented.

many previous research supported these finding and provide explanations such as Hussain & Manhas (2016) who reported that AI enhances loan pricing policies by minimizing the cost of credit risk while still optimizing interest margins for the bank. Also, according to Haag, Hopf, Vasconcelos, & Staake (2022) AI capabilities would enable banks to alter their loan interest rates for each customer after conducting a comprehensive risk

assessment alongside with predictive analytics to predict global interest rates changes and adjust their lending strategies proactively, moreover Dingre (2022) said that AI has the capability to dynamically set interest rates to offer competitive loan rates and remain profitable as well. Chanda & Banerjee (2022) thoroughly explained that with AI-supported credit scoring models, loan underwriting is made more efficient, resulting in a better loans quality and higher safe margins.

Based on these results we can accept the second hypotheses:

H3: AI disclosure has a positive impact on the financial performance (measured by NIM) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

Table 9

Further analysis robustness check (MS)

VARIABLES	**Market share**
AI disclosure score	0.0501**
	(0.0231)
Board size	0.0155**
	(0.0409)
CEO duality	-0.0109*
	(0.0167)
Gender diversity	0.00756
	(0.0579)
Number of board meetings	0.00477**
	(0.00219)
Ownership concentration	-0.129***
	(0.0196)
Bank size	0.102***
	(0.00525)
Long term debt ratio	0.0364
	(0.0543)
Year *fe*	Yes
Country *fe*	Yes
Constant	-1.874***
	(0.170)
Observations	135
R-squared	0.581

Regression results show that AI disclosure has a positive and significant relationship with market share at 0.0501 ($p < 0.05$) indicating that AI can explain 58.1% of variation in market share and an increase by one unit in AI disclosure will result in an increase by 0.0501 unit in market share. These finding is supported by a correlation analysis as AI disclosure exhibits a moderate positive correlation with market share (0.329).

To support these findings Sheth, Jain, Roy, & Chakraborty (2022) results can be used, they stated that AI infused digital banking services boost bank's market share by attracting more customers through customized financial services. Also, Mandapuram, Gutlapalli, Reddy, & Bodepudi (2020) mentioned that AI powered marketing strategy can help banks in customer segmentation thereby expanding businesses to new markets. Additionally, as emphasised by Araújo, Gonçalves, Costa, Dias, & Pereira (2022), the use of AI in enhancing customer experience using chatbots and providing personalized financial products results in increased customer loyalty and market dominance. Finally, (Moinuddin, Usman, & Khan (2024) mentioned that AI helps banks to adapt quickly to rapid market changes and thus gives the banks a competitive advantage by finding solutions to problems as they emerge.

Based on these results we can accept the second hypotheses:

H4: AI disclosure has a positive impact on the financial performance (measured by market share) of the commercial banks listed in Palestine and Amman stock exchange from (2015 to 2023).

Chapter Four

Conclusions and recommendations

4.1 Conclusions

1. A pooled data analysis showed that AI have a significant positive impact on banks ROA across commercial banks listed in Palestine and Amman stock exchange which means that using AI tools within banking operations leads to better resource management and creates improved asset efficiency. This outcome verifies the expectations that AI implements efficient decision procedures and cuts expenses to boost operational effectiveness thereby generating superior returns for assets.
2. Research results demonstrated that AI disclosure resulted in substantial improvements of ROE. Shareholder returns improved for banks that disclosed their AI technology implementations to their investors. The analysis implies that AI allows banks to earn better net income from their current equity which might be achieved through better credit risk assessments and fraud detection and customized financial services
3. The regression analysis showed AI disclosure has a significant positive impact on NIM values. These findings indicate that by optimizing their interest-driven operations through AI banks attain higher operational efficiency in loan pricing adjustments as well as risk segmentation of customers and fund costs.
4. Regression analysis confirmed that banks that disclose AI-related information achieved better market performance results since using extensive AI tools help banks in building bigger customer base and establishing their leadership position in the market. The implementation of AI-powered services such as chatbots and digital onboarding and customized financial products contributed to market expansion
5. The regression analysis confirmed that AI disclosure creates continuous positive effects on all four financial performance metrics. In Table (6) the statistical significance of AI's financial performance effects appears consistently throughout all measured dimensions which demonstrates its robustness about performance metrics. Table (7) confirms these findings with its stable coefficient signs and improved model fit when corporate governance are included in the analysis. The findings

reinforce the theory that AI functions as a transformative procedure to improve operational efficiency and strategic competitiveness in banking institutions and offers banks with means to boost their profitability and efficiency of lending alongside stronger market position capabilities.

Having examined the findings of the study and ascertained their degree of compatibility with the former concepts and theories that explained the relationship between artificial intelligence and financial performance, it can be concluded that the Resource-Based View (RBV) and the Information System Success Model (ISSM) are the best suited to explicate the findings. The findings indicated that AI disclosure positively and significantly impacted Return on Assets (ROA) as well as the Market Share thus mirroring the aspect of RBV. Based on this theory, the competitive position and high performance are activated by unique and non-copyable resources. In this context, IT will serve as a strategic asset permitting banks to increase productivity, minimize operating expenses and maximize the use of assets. The decision to disclose and implement AI systems enabled banks to better realize their resources into profit and establish stronger market presence, a fact that is consistent with the RBV proposition that valuable resources when utilized appropriately would create quantifiable financial results.

Simultaneously, all findings correspond to the Information System Success Model (ISSM) that also pays attention to the importance of system quality, information reliability, and user satisfaction as contributing to the organizational success. The positive correlation between AI disclosure and financial performance indicators shows that AI enhances the quality and accuracy of information accessible to banks, improve decision-making, and fitness in communication with stakeholders. Furthermore, the correlation between AI reporting and market share is closely related to ISSM priorities because AI-transparency will enhance customer trust and investor confidence, increasing a bank competitive match. Combined, RBV and ISSM can best explain the findings, revealing that AI is both a strategic resource and a system that results in a better quality of information and decision-making, which could be eventually translated into increased profitability and improved competitiveness in the marketplace.

4.2 Recommendations

1. Banks in both Palestine and Jordan are recommended to increase their financial commitment to advanced AI technologies and focus their investments on creating tools which boost data analytics capabilities and perform credit scoring and detect fraud while automating customer service operations since it delivers substantial positive results for ROA, ROE and NIM and Market Share.
2. Given the growing reliance on AI systems, it is advisable for banks to develop a detailed internal governance frameworks for maintaining AI tool transparency and ensure accountability throughout the bank. Also data protection and human control policies must be developed by banks to ensure transparency, accountability, and ethical use of AI tools.
3. AI implementation success needs both technological excellence and human workforce development thus its strongly recommended for banks to provide ongoing training to employees about data science alongside training for AI ethics principles and risk modeling as well as cybersecurity practices. The training initiative will enable staff members to master AI-driven environments and execute management practices successfully.
4 Banks may establish standard practices and format about AI disclosure procedures in their annual reports. Enhanced annual report disclosure practices will increase stakeholder trust which enables benchmarking assessments and regulatory as well as investor evaluation of digital transformation development at institutions..
5. Researchers are advised to investigate the differences in AI disclosure outcomes between middle east countries with other advanced economies such as European and United States banking institutions to observe the interplay of regulatory settings and technical capabilities and market development stages with performance results. This comparison of banking AI strategies across different markets would generate more comprehensive worldwide understanding about the professional uses of artificial intelligence technologies in financial establishments.
6. Future researches can use country-based models for moderation or mediation effects to assess how it affects the relationship between AI and performance. This would

provide deeper insights into the contextual factors that influence AI effectiveness in emerging markets

4.3 Limitations

4.3.1 Sample exclusions due to data unavailability

It was necessary to excluded some banks from study sample because key variables could not be reliably obtained, which constrains external validity and raises the risk of selection bias if excluded institutions differ systematically in AI practices or performance, given that all empirical models are estimated on 135 bank-year observations, statistically significant relationships such as the positive association between AI disclosure and banks financial performance indicators could be somewhat sensitive to the composition of the remaining sample (i.e., effects may be overstated or understated if banks with weaker disclosure are under-represented). This limitation reinforces the need to strengthen public AI disclosure and internal reporting processes so that future analyses can retain more observations and better represent both exchanges.

4.3.2 Absence of a consistent AI-disclosure framework:

Because banks do not follow a uniform format in reporting AI activity, the disclosure checklist may capture information inconsistently across banks and years. This creates measurement error and comparability problems. Such issues usually weaken the strength of estimated coefficients and may also cause the checklist to reflect how big or well-known a bank is, rather than its real level of AI disclosure. This matters in the study because AI disclosure shows a positive relationship with ROA and NIM and a significant link with Market Share these relationships that could partly reflect bank size instead of AI to deal with such issues adopting standardized AI disclosure templates, aligned with the study's checklist, would improve validity and ensure that effect sizes are more accurate and comparable across banks and over time.

4.3.3 Inconsistent corporate-governance data

Obtaining consistent, detailed governance data at the bank level is difficult, and when data are missing in systematic ways it reduces the accuracy of estimates and can bias AI results. This is important because governance controls, such as board meetings and gender

diversity, are significant in the ROA models, and the model fits improve when more controls and fixed effects are used. Weak or incomplete governance data therefore risks misestimating the role of AI. to handle such difficulties formalizing AI-governance frameworks, improving data stewardship, and ensuring continuous training would not only strengthen managerial practice but also provide more consistent, reliable governance data, leading to better estimates in future research.

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Appendices

Appendix (A)

ISO/IEC 27001:2022 – Information Security Controls

Clause	Control Title	Description	Category
5.1	Policies for information security	Information security policy and topic-specific policies shall be defined, approved by management, published, communicated, acknowledged, and reviewed regularly.	Organizational Controls
5.2	Information security roles and responsibilities	Information security roles and responsibilities shall be defined and allocated according to organizational needs.	Organizational Controls
5.3	Segregation of duties	Conflicting duties and responsibilities shall be segregated to reduce risks of unauthorized or unintentional changes.	Organizational Controls
5.4	Management responsibilities	Management shall require personnel to apply information security in accordance with policies and procedures.	Organizational Controls
5.5	Contact with authorities	The organization shall maintain contact with relevant authorities for information security matters.	Organizational Controls
5.6	Contact with special interest groups	The organization shall establish and maintain contact with security forums and professional associations.	Organizational Controls
5.7	Threat intelligence	Information security threats shall be collected and analyzed to produce actionable threat intelligence.	Organizational Controls
5.8	Information security in project management	Information security shall be integrated into project management processes.	Organizational Controls
5.9	Inventory of information and assets	An inventory of information and associated assets, including owners, shall be maintained.	Organizational Controls
5.10	Acceptable use of information and assets	Rules for acceptable use and handling of information assets shall be documented and enforced.	Organizational Controls
5.11	Return of assets	Personnel and others shall return organizational assets upon termination of employment or contract.	Organizational Controls

5.12	Classification of information	Information shall be classified based on confidentiality, integrity, and availability.	Organizational Controls
5.13	Labelling of information	Procedures for labelling information shall be developed in accordance with the classification scheme.	Organizational Controls
5.14	Information transfer	Rules and procedures shall be in place for all information transfers within and outside the organization.	Organizational Controls
5.15	Access control	Rules to control access to information and assets shall be implemented based on business needs.	Organizational Controls
5.16	Identity management	Identity lifecycle shall be managed effectively.	Organizational Controls
5.17	Authentication information	Management of authentication information shall be controlled and personnel advised on handling.	Organizational Controls
5.18	Access rights	Access rights to information and assets shall be provisioned, reviewed, and revoked as appropriate.	Organizational Controls
6.1	Screening	Background checks shall be conducted for new personnel and ongoing as required.	People Controls
6.2	Terms and conditions of employment	Employment contracts shall define responsibilities for information security.	People Controls
6.3	Information security awareness, education and training	Personnel shall receive awareness and training on information security.	People Controls
6.4	Disciplinary process	A disciplinary process shall be in place for violations of information security policies.	People Controls
6.5	Responsibilities after termination or change of employment	Responsibilities post-employment shall be enforced and communicated.	People Controls
7.1	Physical security perimeters	Security perimeters shall be defined to protect critical areas.	Physical Controls
7.2	Physical entry	Secure areas shall be protected with access controls.	Physical Controls
7.3	Securing offices, rooms and facilities	Facilities shall be designed to prevent unauthorized access.	Physical Controls
7.4	Physical security monitoring	Premises shall be monitored for unauthorized physical access.	Physical Controls
8.1	User endpoint devices	Information on user devices shall be protected.	Technological Controls
8.2	Privileged access rights	Privileged access shall be restricted and managed.	Technological Controls

8.3	Information access restriction	Access to information shall be restricted per access control policy.	Technological Controls
8.4	Access to source code	Access to source code and related tools shall be managed.	Technological Controls
8.5	Secure authentication	Secure authentication technologies and procedures shall be implemented.	Technological Controls
8.6	Capacity management	Resource usage shall be monitored and aligned with requirements.	Technological Controls
8.7	Protection against malware	Protection against malware shall be implemented and supported by user awareness.	Technological Controls
8.8	Management of technical vulnerabilities	Vulnerabilities shall be identified and mitigated.	Technological Controls
8.9	Configuration management	Configurations of hardware, software, services and networks shall be documented and managed.	Technological Controls
8.10	Information deletion	Information shall be securely deleted when no longer needed.	Technological Controls
8.11	Data masking	Data masking shall be applied according to policies and legal requirements.	Technological Controls
8.12	Data leakage prevention	Measures shall be in place to prevent leakage of sensitive information.	Technological Controls
8.13	Information backup	Backup copies of information, software and systems shall be maintained and tested.	Technological Controls
8.14	Redundancy of information processing facilities	Redundancy shall meet availability requirements of information systems.	Technological Controls
8.15	Logging	Logs shall be created, stored, protected and analyzed.	Technological Controls
8.16	Monitoring activities	Networks, systems and applications shall be monitored for anomalies.	Technological Controls
8.17	Clock synchronization	System clocks shall be synchronized to an approved time source.	Technological Controls
8.18	Use of privileged utility programs	Use of utility programs with elevated access shall be restricted and controlled.	Technological Controls
8.19	Installation of software on operational systems	Procedures shall be in place to control software installation.	Technological Controls
8.20	Network security	Networks and devices shall be secured and controlled.	Technological Controls
8.21	Security of network services	Security of network services shall be identified, implemented and monitored.	Technological Controls

8.22	Segregation of networks	Network segregation shall be implemented to protect systems and services.	Technological Controls
8.23	Web filtering	Access to external websites shall be managed to reduce risks.	Technological Controls
8.24	Use of cryptography	Cryptography use and key management shall be defined and enforced.	Technological Controls
8.25	Secure development life cycle	Secure development rules shall be established and followed.	Technological Controls
8.26	Application security requirements	Security requirements for applications shall be defined and approved.	Technological Controls
8.27	Secure system architecture and engineering principles	Principles for secure system design shall be documented and applied.	Technological Controls
8.28	Secure coding	Secure coding practices shall be followed in development.	Technological Controls
8.29	Security testing in development and acceptance	Security testing shall be integrated into the software development lifecycle.	Technological Controls
8.30	Outsourced development	Activities related to outsourced development shall be directed and monitored.	Technological Controls
8.31	Separation of development, test and production environments	These environments shall be separated and secured.	Technological Controls
8.32	Change management	Change procedures shall be applied to information systems.	Technological Controls
8.33	Test information	Test data shall be protected and managed appropriately.	Technological Controls
8.34	Protection of information systems during audit testing	Audit and assurance activities shall be planned and agreed upon with management.	Technological Controls

Appendix (B)

ISO/IEC 27701:2019 – PIMS-Specific Controls

Control ID	Title	Description	Entity
A.7.2.1	Identify and document purpose	Identify and document specific purposes for processing personal data.	Data Controller
A.7.2.2	Identify lawful basis	Determine and document the lawful basis for processing personal data.	Data Controller
A.7.2.3	Consent process	Establish a process to demonstrate when and how consent was obtained.	Data Controller
A.7.2.4	Obtain and record consent	Obtain and document consent according to established processes.	Data Controller
A.7.2.5	Privacy impact assessment	Conduct assessments when introducing new or changed data processing.	Data Controller
A.7.2.6	Contracts with processors	Ensure written contracts address control implementation with processors.	Data Controller
A.7.2.7	Joint controller responsibilities	Define roles and responsibilities in joint control relationships.	Data Controller
A.7.2.8	Processing records	Maintain secure records to support processing obligations.	Data Controller
A.7.3.1	Fulfilling data subject obligations	Document and meet obligations to data subjects.	Data Controller
A.7.3.2	Information for data subjects	Document what information will be provided and when.	Data Controller
A.7.3.3	Provide information	Provide clear and accessible information about data processing.	Data Controller
A.7.3.4	Modify/withdraw consent	Provide mechanisms to modify or withdraw consent.	Data Controller
A.7.3.5	Object to processing	Enable objections to data processing.	Data Controller
A.7.3.6	Access, correction, erasure	Implement policies for data access, correction, or deletion.	Data Controller
A.7.3.7	Inform third parties	Notify third parties of changes or objections to shared data.	Data Controller
A.7.3.8	Provide copy of data	Be able to provide a copy of personal data upon request.	Data Controller
A.7.3.9	Handle requests	Establish procedures to manage legitimate requests.	Data Controller
A.7.3.10	Automated decision-making	Address obligations related to automated processing outcomes.	Data Controller
A.7.4.1	Limit collection	Limit personal data collection to what is necessary and proportionate.	Data Controller
A.7.4.2	Limit processing	Ensure data processing is limited to what is adequate and relevant for the purposes.	Data Controller

A.7.4.3	Accuracy and quality	Ensure personal data is accurate, complete, and up to date throughout its lifecycle.	Data Controller
A.7.4.4	Data minimization objectives	Define and document data minimization objectives and mechanisms.	Data Controller
A.7.4.5	De-identification and deletion	Define how personal data is de-identified or deleted when no longer needed.	Data Controller
A.7.4.6	Temporary files	Ensure deletion or anonymization of temporary files containing personal data.	Data Controller
A.7.4.7	Retention	Do not retain personal data longer than necessary for its purpose.	Data Controller
A.7.4.8	Disposal	Implement documented procedures for secure personal data disposal.	Data Controller
A.7.4.9	Transmission controls	Control the transmission of personal data to ensure it reaches the intended destination.	Data Controller
A.7.5.1	Basis for transfer	Document legal basis for transferring data between jurisdictions.	Data Controller
A.7.5.2	Identify countries/orgs	Identify countries and organizations to which data may be transferred.	Data Controller
A.7.5.3	Transfer records	Maintain records of data transfers and support obligations to data subjects.	Data Controller
A.7.5.4	Disclosure records	Record all disclosures to third parties, including data type, recipient, and timing.	Data Controller
B.8.2.1	Customer agreement	Ensure contracts specify processor's role and assistance to customer obligations.	Data Processor
B.8.2.2	Processor purpose	Process data only per customer instructions.	Data Processor
B.8.2.3	Marketing and advertising	Do not use data for marketing unless consent is obtained; do not require consent as a service condition.	Data Processor
B.8.2.4	Infringing instruction	Inform the customer if any instruction appears to breach legal obligations.	Data Processor
B.8.2.5	Support customer obligations	Provide customer with information needed for compliance.	Data Processor
B.8.2.6	Maintain records	Maintain necessary records to demonstrate contract compliance.	Data Processor
B.8.3.1	Support data subject rights	Enable the customer to meet obligations to data subjects.	Data Processor
B.8.4.1	Dispose of temporary files	Delete or destroy temporary files within a documented timeframe.	Data Processor
B.8.4.2	Return, transfer, or dispose data	Securely handle return, transfer, or disposal of personal data and share policy with customer.	Data Processor
B.8.4.3	Transmission controls	Ensure personal data transmission is protected.	Data Processor

B.8.5.1	Notify transfer basis	Notify customer of legal basis for international transfers.	Data Processor
B.8.5.2	List countries/orgs	Document countries and organizations to which data may be transferred.	Data Processor
B.8.5.3	Record disclosures	Keep records of data disclosures to third parties.	Data Processor
B.8.5.4	Notify disclosure requests	Notify customer of legally binding requests for personal data.	Data Processor
B.8.5.5	Reject unauthorized disclosures	Reject unauthorized disclosure requests and consult customer.	Data Processor
B.8.5.6	Disclose subcontractors	Inform customer before using subcontractors.	Data Processor
B.8.5.7	Engage subcontractors per contract	Only engage subcontractors under terms approved by the customer.	Data Processor
B.8.5.8	Inform change in subcontractors	Inform customer of any subcontractor changes, allowing objection.	Data Processor

جامعة النجاح الوطنية
كلية الدراسات العليا

اثر تطبيق الذكاء الاصطناعي على الأداء المالي للبنوك التجارية المدرجة في بورصة فلسطين وعمان للفترة 2015-2023

إعداد
أمير عباس جبر دويكات

إشراف
د. غسان دعاس
د. علاء الدين دويكات

قدمت هذِه الرسالة استكمالاً لمتطلبات الحصول على درجة الماجستير في المحاسبة، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس، فلسطين.
2025

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الملخص

تتناول هذه الدراسة تأثير الذكاء الاصطناعي على الأداء المالي للبنوك التجارية المدرجة في بورصتي فلسطين وعمّان خلال الفترة من 2015 إلى 2023. يتمثل الهدف الرئيسي من هذا البحث في تحديد ما إذا كان بالإمكان تحسين الأداء المالي للبنوك التجارية من خلال تطبيق تقنيات الذكاء الاصطناعي في الأسواق الناشئة التي تتسم باختلاف الظروف الاقتصادية والتكنولوجية. استخدمت الدراسة عينة مكونة من 4 بنوك تجارية مدرجة في بورصة فلسطين و11 بنكًا تجاريًا مدرجًا في بورصة عمّان خلال نفس الفترة.

استند تقييم الأداء المالي في هذه الدراسة إلى أربعة مؤشرات رئيسية، وهي: العائد على الأصول, العائد على حقوق الملكية, هامش صافي الفائدة والحصة السوقية. أما تقييم تطبيق الذكاء الاصطناعي فاعتمد على ما إذا كانت البنوك التجارية قد أدرجت تفاصيل حول ممارساتها أو تقنياتها المتعلقة بالذكاء الاصطناعي في تقاريرها المالية. في حين تم استخدام حوكمة الشركات كتغير ضابط، حيث تم تمثيلها بسبعة متغيرات هي: حجم البنك، تركّز الملكية، حجم مجلس الإدارة، نسبة الدين طويل الأجل، ازدواجية منصب الرئيس التنفيذي، نسبة تمثيل النساء في مجالس الادارة وعدد اجتماعات مجلس الإدارة، وذلك بهدف استكشاف العوامل المؤسسية المؤثرة في العلاقة بين الذكاء الاصطناعي والأداء المالي.

تُسهم هذه الدراسة في إثراء الأدبيات المتنامية حول التحول الرقمي في القطاع المصرفي، من خلال تقديم دليل تجريبي مستند إلى بيانات من سوق ناشئة. ويُعد ذلك ذا أهمية بالغة في مساعدة البنوك على تحقيق أهدافها التشغيلية وتعزيز مكانتها السوقية وزيادة ثروة المساهمين. وأخيرًا، تقدم هذه الدراسة عددًا من التوصيات العملية الموجهة للبنوك،

والهيئات التنظيمية، والباحثين المستقبليين، مع التأكيد على أهمية زيادة الاستثمار في تقنيات الذكاء الاصطناعي، وتحسين أطر الحوكمة، وتوسيع الدراسات المقارنة على المستويين الإقليمي والدولي.

الكلمات المفتاحية: الذكاء الاصطناعي؛ الاداء المالي؛ البنوك التجارية؛ العائد على الاصول؛ العائد على الملكية؛ هامش صافي الفائدة؛ الحصة السوقية؛ حوكمة الشركات؛ بورصة فلسطين؛ بورصة عمان.