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**Artificial Intelligence (AI) Disclosure and Financial Performance:  
An Empirical Study of Egyptian Banks**

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**Abstract** The present paper aims to discuss the degree to which analyzed Egyptian banks integrate AI techniques into their functioning and assess the relationship between AI disclosure and business outcomes. Based on content analysis by Atlas. ti 23, AI-related terms were identified in annual report data of the period 2017 – 2023 from 17 Egyptian banks listed in the Central Bank of Egypt (CBE). In using regression analysis, the results showed that AI disclosure has been slowly improving while some banks still have low disclosures revealing that extraordinary AI application is still in its nascent stages. The research evidence demonstrates that AI disclosure improves firm accounting performance in terms of ROA and ROE and decreases total operational costs. These outcomes are consistent with findings within the international literature indicating that AI facilitates optimisation and optimisation of financial performances achieved by reducing costs and increasing revenues. This research enriches the literature on the use of AI in banking especially in the Middle East by presenting a framework for measuring AI disclosure and discussing its relationship with organizational performance. The work is useful for Egyptian authorities, financial supervisors and other banking personnel to gain more insights regarding the current state of AI disclosures and how they should enhance the quality of such disclosures to help improve the operations, decision making and organisational strategic direction of financial firms in Egypt.

**Keywords:** AI, Financial Performance, Egyptian Banking Sector

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## **Introduction**

In the last few decades, the main concern of research in artificial intelligence AI is on developing intelligent computers that can perform tasks which would require human intelligence. AI use computers and programs that are designed to learn, think, and make decisions all with the use of data (Duan et al. 2019). It refers to the use of technical knowledge to mimic human intelligence that can act as analytic tools, functional aid and general support in numerous disciplines. AI is the science and technique of making smart machines that are designed to exhibit features associated with human intelligence. Substantial advancements of pragmatic applications of AI started from the twenty-first century that has embraced powerful machinery and increased data (Korteling et al. 2021; Zhu et al. 2023).

The degree and precise form of how AI will be applied and carried out will vary according to the pending sector, overall objectives or aims, and resources that can be committed. Some companies alleviated the AI challenges by developing AI competence inside their organizations, collaborating with AI solutions providers, or using cloud-based AI solutions to seize AI value and gain competitive advantage within their industries. AI has been seen to bring great benefits in the implementation to the banking sector through effectiveness, reliability and customer sensitive services (Palomares et al. 2021). AI offers many possibilities to enhance banking services and generate new ones, such as more efficient data analysis, learning platforms, individual approaches in a marketing context, automization in repetitive tasks, new channels of communication, e.g., chatbots, understanding of natural language and voice identification, risk-based prognoses of maintenance and fraud and much more. AI is the act of incorporating human systems of factor into machines (Dwivedi et al. 2021; Vieira and Sehgal, 2017).

AI enhances resource efficiency and sustainability. Data-driven businesses can improve judgments and make more accurate predictions. It is a more advanced digital transformation method that extracts knowledge from existing massive databases (Badmus et al. 2024). Thus, implementing AI processes will increase bank staff productivity. Previous research indicates that banks have already identified cost savings and income generating opportunities by improving the quality of their operational processes, such as lending, security services, compliance improvements, fraud detection, and new types of services. Furthermore, these tailored solutions and services provide

customers specialized investment plans, wealth management techniques, and robo-advisors. AI already plays an important role in autonomous decision-making processes, real-time asset and process monitoring, and value creation, with the benefits expected to grow in the future (Tien, 2017).

In the continuously changing banking market, the integration of AI has enormous promise for improving decision-making processes and financial performance. While AI has the potential to improve financial reporting, it can also introduce bias, a lack of transparency, data privacy concerns, and compliance issues. Organizations may experience job displacement, training gaps, high implementation costs, interoperability issues, and ethical problems. To prevent these negative consequences, enterprises should prioritize responsible AI practices, invest in data quality and governance, and address potential biases in AI models. Staying up to date on rules and ethical considerations is also critical (Antwi et al. 2024; Sreseli, 2023).

There are several reasons for doing this study, including addressing stakeholders' concerns about the accountability and transparency of AI systems. Transparent disclosure might entice investors that value technologically informed decision-making, thereby influencing a company's valuation and shareholder makeup. Aside from luring investors, transparent AI disclosure can help integrate with changing regulatory frameworks (Bogina et al. 2022). As regulatory organizations investigate the ethical and responsible integration of AI, companies that reveal their AI practices can demonstrate adherence to these rules, thereby contributing to compliance and a strong corporate reputation. These findings imply that AI applications are helpful to the banking sector, shareholders, and stakeholders, as well as greater financial sector efficiency, which leads to economic advantages (Montez, 2022).

However, measuring the relationship between AI usage and bank performance is necessary to investigate the extent to which AI influences businesses, customers, and the overall economy. Despite the prospects and benefits of applying AI, AI disclosure remains voluntary. Companies have almost complete discretion about whether to share, to what amount, and what type of information. Currently, there is no widely agreed standard for the level of AI transparency. AI applications are fairly recent. There are no established international reporting standards in this field. Existing AI disclosure procedures fail to appropriately represent AI's distinctive implications (Abrokwah-Larbi and Awuku-Larbi, 2024).

The lack of a uniform vision and reporting standards for AI leads to varying disclosure methods based on company perception. While numerous studies have been undertaken on the benefits of AI in the banking industry, there is still a study gap regarding the influence of AI disclosure on financial performance. Filling this gap is critical for shedding light on the possible benefits of AI disclosure (Estep et al. 2024). To fill this research vacuum, this paper looks at the existing degree of AI-related term disclosure procedures in Egyptian banks.

The research develops an AI disclosure index by assessing the prevalence of AI in annual report data and investigating the impact of mentioning AI-related keywords on financial performance to investigate the possible impact of revealing AI-related terms on these institutions' financial performance. Clear and ethical communication about AI activities can also help a company build a reputation as a responsible innovator, promoting trust among customers and partners. On the other hand, a lack of openness or bad perceptions may result in skepticism and a ruined reputation, thereby harming financial success. Furthermore, the purpose of this study is to bring significant insights to the discussion about AI's role in influencing modern company performance by providing a complete viewpoint that includes ethical, regulatory, financial, and reputational factors.

There is a possibility that there is a lack of empirical evidence concerning the direct relationship between artificial intelligence disclosure and financial results, however this is contingent upon the date of the study. As a result, the purpose of this study is to provide a response to the following research question:

*Could the AI disclosure improve the Egyptian banks financial performance?*

Based on a content analysis of 140 annual reports for 20 Egyptian-listed banks from the period 2017 to 2023, the study found that AI disclosure positively and significantly impacts financial performance, particularly Return on Equity (ROE), in the Egyptian banking sector. Thus, the burgeoning amount of literature on artificial intelligence is further augmented by this work. Firstly, it creates the first AI related phrase disclosure index with which it could determine the current state of artificial intelligence terms disclosure in

Egyptian banks. Second, it provides some information concerning the relationship between AI disclosure and Company's financial performance. The results of this research are important for legislators, international authorities, and supervisory organisations to address the issues associated with AI disclosure and stress the need for the development of disclosure guidance. Third, the study provides an input to the practitioners in the banking industry who are in the process of changing their operations with the help of AI mechanisms. This also feeds into the rationale for enhancing transparency of AI and to enable decision making with regard to financial institutions in a manner that enhances fiscal objectives and goals. Concerning the other parts of this work which is a systematic account of its layout the following can be said. Section 2 precedes with the literature review of the relevant studies. An example of the research process is described in Section 3. In the fourth and fifth area, the results of the study are reported and analyzed then the conclusion section is covered.

## **Literature review**

### **AI disclosure**

AI disclosure also refers to the practice of offering elaborate information of the extent and the manner in which an organization deploys forms of AI technologies. It consists in explaining how and why AI is used, for what purpose, and what possible advantages and disadvantages are implied. It is becoming more popular since the public is increasing its pressure for corporate governance of organizations' technological innovation. While AI disclosure is still a playing field for advertising technological expertise, it is at the same time a requirement setting up confidence among the investment community and customers as well as regulatory bodies (Felzmann et al. 2020).

However, a distinct lack of binding legislation and lack of common best practices have rendered AI disclosure a largely voluntary process. There are some specific remarks regarding the use of the Australian disclosure system: Firstly, organizations have substantial freedom in deciding the level and method of reporting, which results in an incomplete picture. Businesses release AI information in annual or sustainability reports as well as technology reports but the level of information released depends on tradition, regulation and corporate strategy (Hacker, 2023).

Thus, AI disclosure can be rather useful within the banking sector because the sphere deals with trust and openness of certain processes. The application of AI in operations like fraud detection, customer service, or risk management is a challenge of translating these functions into cultural, legal, and business terms and policies. Proper disclosure makes it easier for banks to show that they are serious about regulating the use of artificial intelligence while on the other hand making it easier for them to build a reputation of being innovative and responsible organizations (Lappeman et al. 2022).

There are nevertheless problems associated with AI disclosure. It is challenging to find a clear narrative of how organizations can provide information and, at the same time, ensure that their trade secrets remain safe. Also, there is the issue of the afraid of showing weakness or attracting the regulator's attention that can prevent firms from reporting their AI use. To overcome these challenges, it is again about the regulators, industries, and the stakeholder parties to come up with acceptable disclosure standards whereby results of real artificial intelligence are disclosed (Tong et al. 2021).

### **Financial performance**

Financial performance relates to the capacity of an organization to generate revenue, exercise control over costs and report profit within a stated period. This is an essential dimension used in measuring organizational performance and financial stability of an enterprise. Measures of financial performance include; return on investment (ROI), return on assets (ROA), return on equity (ROE), net profit margins and total expenses. These metrics are useful to investors, regulators and the business management to determine the stability and growth prospects of a business (Abdelraouf et al. 2024; Allam and Abdelraouf, 2023; Ekinici and Poyraz, 2019).

In the banking industry for example, financial performance has a different connotation given it is operating conditions that are governed by the law and is trusted with the public's money. Those are key OSI, including net interest margin, cost-to-income, and non-performing loan ratios. Financial performance therefore encompasses risks management ability for a bank, capital utilisation and how the bank is positioned in the market (Bryce, 2017). All these performance indicators are likely to be influenced by the use of advanced technologies such as AI. (Shiyyab et al. 2023)

AI can contribute to improved financial performance in businesses through the elimination of time and effort in repetitive processes, increase cost efficiency and drive the improvement of business decision-making processes as adaptive control risk assessment technologies provide banks with the ability to reduce credit losses, and forecast analysis enhances investment strategies as well as customer segmentation. Therefore, AI can be used to drive revenue growth as well as to cut costs, with a clear impact on performance indicators (Wamba-Taguimdje et al. 2020).

On the other hand, the financial benefits from AI are not easy to realize because it needs a significant amount of investments on infrastructure, training, and regulation as threats including high implementation costs, issues as data privacy and regulatory concerns may influence the short-term financial outcomes. Hence, there is need for moderation so as to rein in these costs while at the same time driving strategic monetary returns in form of long-term organization goals and missions (Mhlanga, 2020).

### **AI and Financial performance**

It is thus not a surprise that interest in understanding the connection between AI and financial performance has risen recently. The application of AI technology has hitherto demonstrated the ability of achieving efficiency, precise and scalability of financial operations. In banking, AI as automation of fraud detection, credit risk analysis, and customer interaction contribute to better financial results most of the time. This paper also explains how application of artificial intelligence in banking can lead to more cost cuts, new sources of income and higher levels of customer satisfaction (Dwivedi et al. 2021).

The major AI impact on organizations examined in empirical studies include people, process, and technology leads to improved financial performance. AI age related automation leads to the enhancement of operational costs reduction by avoiding numerous interferences and mistakes (Agarwall et al. 2022). Moreover, AI can also be used to place better-targeted communications thereby delivering higher customer acquisition and retention and ultimately enhancing revenues. Such measures as ROA and ROE are usually better after implementing those AI-driven effectiveness possibilities (Geetha et al. 2024).

As has been presented, AI disclosure also emerges to be the independent variable that affects financial performance. In this way, companies shall open up communication on Artificial Intelligence projects, which is helpful in creating trust among stakeholders as well as the public (Akisik and Gal, 2020). Unfortunately, the public and consumers will only engage with organizations that make their AI plans clear and understandable. Additional regulatory compliance which is effective in attaining responsible AI disclosure would reduce fines and damage to reputation which otherwise would impact on financial performance (Mishra, 2024).

Finally, there is more tension between AI and financial performance, as this paper seeks to demonstrate. Lack of AI decision making, or inadequate AI risk management typically results in adverse consequences such as higher operational risks or low MC/DC by the stakeholders. Thus, despite many potential benefits to promoting better financial performance AI is not without risks and the results greatly depend on the strategic and ethical approaches to planning as well as disclosure policies.

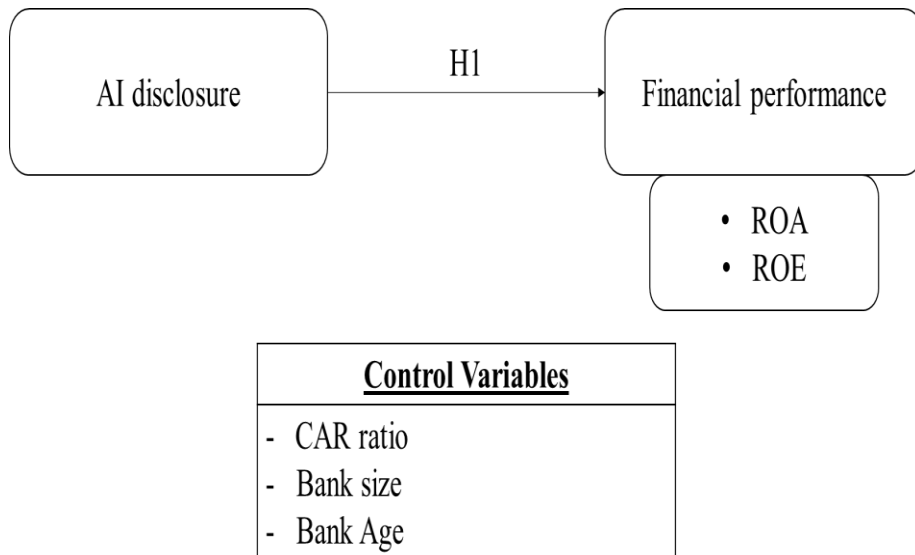
### **Summary of previous studies**

In analysing the role of AI disclosure and its impact on financial performance while focusing on the banking sector, the present literature review is conducted. AI disclosure is the process of informing about the nature of an organisation's AI tools, purposes, and effects, which has emerged as critical in responding to public expectations in particular and maintaining the confidence of stakeholders, investors, and regulators in general. Although AI helps to increase the financial performance through costs' optimization, operations' effectiveness and decision making, the AI realization is difficult and problematical. The review also points to the fact that utilisation of AI means better and virtual functions like ROA & ROE with continuing customer relations coupled with risk management. But as we know to capture all of these returns entail extensive investments on infrastructure, training and up till regulation all in implementing the solutions which may also have great risks such as, high implementation costs, data privacy, and regulatory issues. **Therefore, the suggested hypothesis and research model as follows:**

***H1: The AI disclosure has a significant effect on Egyptian banks financial performance.***



**H2:** *The AI disclosure has an insignificant effect on Egyptian banks financial performance*



*Figure 1. Conceptual model*

Source: Developed by the authors

## **Methods**

The AI-SIS method is utilized to evaluate AI disclosure levels and develop a preliminary list of AI-related keywords. Similar methods have been applied in prior studies (e.g., Hassanein et al., 2019; Elmarzouky et al., 2021; Karim et al., 2021; Alkaraan et al., 2022). **Development of the AI Disclosure Index:** This begins with an extensive review of AI components frequently referenced in the financial sector by professional organizations such as the FSB (2017), OECD (2019), and IOSCO (2020). Reports like the 2019 AI Index Report highlight common terms such as “AI,” “Big Data,” “Cloud,” and “Machine Learning” (Perrault et al., 2019). Related studies use various self-developed proxies for disclosure measurement (e.g., Finkenwirth, 2021; Zetsche et al., 2020; Hussainey et al., 2022). Content analyses in this context have focused on identifying keywords like “Artificial Intelligence,” “Machine Learning,” and “Big Data” in corporate reports (e.g., Omar et al., 2017; Cam et al., 2019). Additionally, research such as Bonsón et al. (2023) categorized terms like “automat” and “algorithm” through similar analyses.

McWaters (2018) emphasizes that understanding AI applications requires considering their interplay with other technologies. A comprehensive set of frequently mentioned AI terms is synthesized into a preliminary AI disclosure index (see Appendix A). **Frequency Analysis Using Content Analysis Software:** The occurrences of AI-related terms are analyzed in banks' annual reports using the software Atlas.ti 23. Alongside keyword frequency, their contextual usage, including surrounding sentences, is examined to gain insights into strategic AI applications.

### **Keyword Classification:**

AI-related terms are categorized into three groups:

- Digital awareness, transformation, and capabilities.
  - AI applications, services, products, and processes.
  - AI challenges and threats, including cybersecurity issues.
- These categories (detailed in Appendix A) are then incorporated into multiple regression analyses.

### **Regression Models and Variables:**

The relationship between AI disclosure and financial performance is examined through regression models:

- **Model 1:**  $ROA = \alpha_0 + \beta_1 \text{AIFreq.} + \beta_2 \text{CAR} + \beta_3 \text{Bk SIZ} + \beta_4 \text{Bk AGE} + \varepsilon$
- **Model 2:**  $ROE = \alpha_0 + \beta_1 \text{AIFreq.} + \beta_2 \text{CAR} + \beta_3 \text{Bk SIZ} + \beta_4 \text{BkAGE} + \varepsilon$

Financial performance is evaluated using indicators such as return on assets (ROA), return on equity (ROE). Studies suggest that effective management, reflected in high ROA and ROE, correlates with better firm performance (e.g., Almustafa et al., 2023; Hasan et al., 2023). Additionally, Capital adequacy ratio (CAR), Bank size and bank age are included, assuming that AI adoption enhances performance by lowering costs and increasing revenues.

The variable **AIFreq.** represents the frequency of AI-related term mentions, measured from annual reports (Alkaraan et al., 2022; Finkenwirth,

2021). Several factors influencing banks' AI disclosure practices are accounted for financial performance and economic attributes (See. Table 1.).

*Table 1. Variables with definitions*

<b>Variable</b>	<b>Definition</b>
<b>AIFREC</b>	The number of AI-related terms mentioned in each annual report.
<b>ROA</b>	Return on assets.
<b>ROE</b>	Return on equity.
<b>CAR</b>	Capital adequacy ratio
<b>BKSIZ</b>	The natural logarithm of assets.
<b>BKAGE</b>	The total number of years since the bank's establishment

Source: Developed by the authors

## Sample and Data

Companies' financial information is used concurrently with non-financial data by financial analysts to gain a clear vision of organizations' performance. Yearly reports stand as a major reference for investors' decision-making in the market for finance (Araújo Júnior et al. 2014; Zhou et al. 2017). This research analyzes 136 annual reports from all 17 Egyptian-listed banks over the period 2017–2024. Most of these reports are available in PDF format on the banks' official websites. The analysis involves searching for relevant keywords identified through context analysis. The newly developed keyword dataset from these annual reports offers valuable insights into the progression of AI-related mentions.

## Results and Discussion

### Descriptive analysis

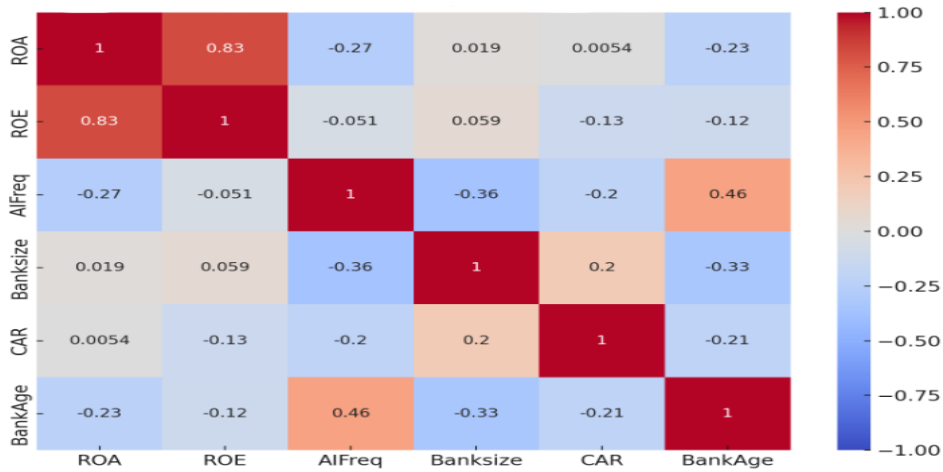
*Table 2. Summary of Descriptive*

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>AIFreq.</b>	112	0.2687917	0.1391633	0.03	0.5633333
<b>ROA</b>	112	0.0154524	0.0100077	0.0012368	0.0542072
<b>ROE</b>	112	0.1555052	0.0916383	0.010354	0.4048033
<b>BKSIZ</b>	112	9.493252	1.361237	7.601597	11.68787
<b>CAR</b>	112	0.1810132	0.0410753	0.0843333	0.3107
<b>BKAGE</b>	112	1.645548	0.3670495	1	2.220108

Source: Data results based on STATA V. 17 Output

In Table 2 below are the descriptive statistics of the major variables culled from 112 observations from the V. 17 STATA output. Exclusive of the five outliers, for the remaining seventy-five samples, the mean AIFreq = 0.27 ± 0.14 (SD); this section reveals a moderate variability, and stretches up to 0.56. The mean values of ROA and ROE are 0.015 and 0.156 respectively and low standard deviations show that both profitability are rather constant. The mean value for the bank size that was calculated as the natural log of total assets is 9.49 with a standard deviation of 1.36; range= (7.60-11.69). CAR is 0.18 and not very spread out; SD is 0.041 This indicates the organizations' capitalization is more or less uniform across the board. Finally, Bank Age has a mean of 1.65 in the scale range of 1- 2.22 which means a relatively mature sample. These descriptive results present variability of the financial values, thereby offering the understanding of the operational difference and productivity of ten commercial banks in the samples.

## Correlation



\* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Figure 2. heatmap

Source: Data results based on STATA V. 17 Output

The heatmap illustrating the correlation between the selected variables (ROA, ROE, AIFreq, Banksized, CAR, and BankAge). The intensity of colors indicates the strength and direction of the correlations: red represents positive correlations, and blue indicates negative correlations. Observing figure 2. It shows that there is a positive strong significant relationship between ROA and ROE at 99% confidence level. In addition, there is a negative weak significant relationship between ROA and AIFreq at 95% confidence level. While the rest considered to be control variables are used for strengthening the independent variable. This table of analysis does not respond to the suggested hypothesis but only showing the strengths between the variables. Therefore, additional analysis are necessary to answer to our suggested hypothesis.

## Regression Model

Table 3. Heteroscedasticity result

Test	Result
<b>Breusch-Pagan/Cook-Weisberg heteroscedasticity</b>	<b>test for Prob &gt; chi2 = 0.0000</b>

Source: Data results based on STATA V. 17 Output

Also, since the obtained Prob > chi2 value of 0.0000 is lesser than the chosen significance level of 0.05, we reject the null hypothesis suggesting homogeneity of variance. This means that the assumption of homoscedasticity – a constant variance – has been violated and therefore the model is heteroscedastic. As stated in the instructions regarding the heteroscedasticity test whereby we got the p-value of 0:0000, we cannot proceed to doing the Hausman test. Therefore, the assistant employed a strong linear regression model (e.g., “regress ROA AIFreq. To deal with a heteroscedasticity problem, a firm-level fixed effect model has been estimated with the following control variables, “Banksize CAR BankAge, vce (robust)”.

Table 4. Model 1 and 2

ROA Model 1				
	Coefficient	Std. Error	t-Statistic	P-Value
<b>AIFreq.</b>	0.0000152	0.00000848	1.80	0.075
<b>BKSIZ</b>	0.0000154	0.0000346	0.45	0.656
<b>CAR</b>	0.0002468	0.0011141	0.22	0.825
<b>BKAGE</b>	-0.0001274	0.0001296	-0.98	0.328
<b>_cons</b>	0.0002699	0.0004894	0.55	0.582
ROE Model 2				
<b>AIFreq.</b>	0.0090764	0.0031867	2.85	0.005
<b>BKSIZ</b>	-0.0622332	0.0184338	-3.38	0.001
<b>CAR</b>	0.5031502	0.3742237	1.34	0.182
<b>BKAGE</b>	-0.1867498	0.0488019	-3.83	0.000
<b>_cons</b>	1.199255	0.2560733	4.68	0.000

\* $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Observing table 4. It shows that AIFreq. has a positive significant effect on ROA at 90% Confidence level. In addition, AIFreq has a positive

significant effect on ROE at 99% Confidence level since the two ratios ROA and ROE represent the financial performance of the Egyptian bank's profitability. It means that the suggested H1 hypothesis is accepted while H2 hypothesis is rejected.

Table 6. R2 table

<b>Model 2</b>	<b>R</b>	<b>R2</b>	<b>Adjusted R2</b>
<b>ROA</b>	0.768	0.59	0.566
<b>ROE</b>	0.812	0.66	0.640

From equation 5: the, R-squared ( $R^2$  values for Model 2 in table 6 show a satisfactory fit to the selected ROA and ROE model, which ranges between 0.50 – 0.99, acceptable in the social sciences field. In particular, the model for ROA explained 59% of total variance in the dependent variable, which is represented by the indicator  $R^2$ ; the model for ROE shows even higher coefficient, which is 0.66. The use of Adjusted  $R^2$  values, which consider the number of predictors in their computation, is also high at 0.566 for the models based on ROA and 0.640 based on ROE confirming the resilience of the built models. These results suggest that the predictors used in both models are useful in establishing variations of the outcomes because most of the explanatory variables are statistically significant.

## **Discussion**

The findings of this research indicate that AI disclosure is significantly and positively associated with financial performance measured by ROE and a comparatively lower degree of association with ROA among the selected firms of the cross-sectional sample. These results are consistent with studies in the international business literature drawing attention to the degrees of operational improvement and decision-making support that may be attained using AI technologies and the effects on such profitability indicators as ROA and ROE (Dwivedi et al. 2021; Wamba-Taguimdje et al. 2020). As with evidence from other countries, the study identified that the banks which have accessed AI disclosures could be able to cut costs and increase revenue, in support of prior research suggesting that AI will change the financial sector (Lappeman et al. 2022; Palomares et al. 2021).

Nonetheless, this research will fill this gap and contribute to the literature by presenting these conclusions in a specific Egyptian Banking

context that has been examined relatively less. By developing an AI Disclosure Index tailored to the unique dynamics of the region, this study addresses the research gap concerning AI transparency and its implications for financial performance in developing markets. The study also provides evidence that though some Egyptian banks have progressed in the AI disclosures, others are significantly slower, suggesting that there is a blind spot. Such findings point to the need to improve and synchronize AI reporting by applying regulatory measures and the pressure from stakeholders, as Bogina et al.(2022) explain. Further, the study enriches the narrative of AI disclosure's potential consequences. It emphasizes that ethical and transparent communication about AI initiatives create trust and stakeholders' confidence, which previous works argue (Felzmann et al. 2020). The statistical findings also support the hypothesis that, increased frequency of disclosure on AI leads to better financial performance, thereby supporting the strategic importance of transparency for banks desiring to improve their competitive advantage.

This study not only extends support to the global literature that AI influences financial performance but is also the first to present empirical support from the Middle East. The paper offers recommendations on how disclosers and policymakers, as well as banking practitioners, can close existing gaps and use the possibilities of AI to support sustainable development. AI future research could, therefore, extend this work by evaluating the downstream consequences of integration and include qualitative factors different from profitability, such as customer satisfaction or risk measures.

## **Conclusion**

AI disclosure was used in this study to assess the extent of disclosure related to AI with reference to the Egyptian banking sector and to examine its impact on the financial performance, with the help of newly developed AI Disclosure Index. The research evidence showed that AI disclosure benefits the banks by improving the firms' performance since the firm that practices AI disclosure achieves a high return on equity. While aligning with existing international literature, the study also highlights a slower adoption of AI transparency practices in the region, emphasizing the nascent stage of AI integration within the Egyptian banking industry. These results underscore the



strategic importance of AI disclosure as a driver of both operational and financial performance, while also addressing the regional gaps in regulatory and technological development.

### **Theoretical Implications**

Drawing from this study, an extension of the literature regarding the impact of AI disclosure in improving overall financial performance is made. The study delivers findings from the developing economy thus serving an essential need in the research domain that is often dominated by research from developed economies. The present study contributes to the academic discussion by developing a set of metrics for measuring the levels of disclosure in AI, which can prove useful for researchers when it comes to designing the frameworks for AI regulation by providing those frameworks with actionable theoretical underpinnings. The findings also support theoretical perceptions relating to the relationship between IT innovation and organizational performance; they suggest that truthful reporting of AI plans build trust, confidence and align operations as put forward by theoretical frameworks.

### **Practical Implications**

To the practitioners, the study focuses on the following implications of AI disclosure In enhancing business financial performance and operations efficiency. There are key reasons as to why banking institutions must focus on improving the current disclosures encompassing AI; firstly, it is critical to meet the expectations of the stakeholders; secondly, to realize competitive advantages. The AI Disclosure Index proposed in this paper adds a helpful layer for benchmarking and enhancing disclosure practices. It is from this research that decision makers, including policymakers and regulators, can derive principles they can use to develop harmonized rules governing AI disclosure across the financial sector. If issues like highly expensive implementations and data privacy related problems are effectively managed, organizations can avoid different types of risks while implementation of AI can bring better opportunities to enhance profitability.

## **Future Studies**

There could be a sequence of further studies zooming in on the interactional impact of AI disclosure on financial performance and MLSs over extended timescales and addressing possible shifts in the sites' regulatory regimes. Moreover, research can explore other potential perspectives of integrating AI into general work settings regarding it to customer benefits, risks or employees' performance. The study could be extended to encompass a cross sectional comparative study across the developing and developed economies in order to establish how context affects 'openness' to AI. Last but not least, subsequent research can focus on mediating effects that might exist between AI disclosure and ethical concerns, looking at how organizations address the tension between the benefits of transparency, on the one hand, and potential competitive disadvantage and loss of proprietary information, on the other.

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## Appendix Appendix A

Category	Keywords	Sources
<b>General Terms</b>	<b>AI</b> AI, Artificial Intelligence, Machine Learning, Big Data, Cloud, Algorithm, Automat	Perrault et al. (2019); Omar et al. (2017); Cam et al. (2019); Bonsón et al. (2023)
<b>Applications and Techniques</b>	Robotic Process Automation, Virtual Agents, Natural Language Text Understanding, Computer Vision	Cam et al. (2019); Hassanein et al. (2019)
<b>Broader Technology Context</b>	Digital Transformation, Cybersecurity, Information Security	McWaters (2018); Bonsón et al. (2023)