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The dynamics behind private banking growth in Egypt

Doaa M. Salman Abdou^{1*} and Yomna Alarabi²

Abstract

The research investigates the determinants of private banks profitability in Egypt. The determinants are bank specific (liquidity, capital adequacy, bank size, asset structure, credit risk, and non-performing loans), industry-specific (industry concentration and banking industry development), and macroeconomics (economic growth and inflation). It is an empirical study applying a quantitative method for data analysis and the type of data is secondary data. The sample size of the research is 15 private banks on the Egyptian and the panel data for the research is 2013–2022. The multiple linear regression analysis using the Eviews 12 application as an analytical tool by applying generalized least squares model. The profitability of private banks, which is the dependent factor, is calculated by two measurements, Return on Assets and Return on Equity with ten determinants of profitability as independent variables. Results indicate that capital adequacy, economic growth bank size, and inflation has a positive significant effect on private banks profitability in Egypt. While NPL, liquidity and credit risk have significant negative effect on private banks profitability in Egypt. Based on the results recommendations are provided for bank management to maximize their profitability.

Keywords Private banks profitability, Egypt, ROA, ROE, Bank size, Credit risk, Capital adequacy, Non-performing loans, Asset structure, Banking sector development, Industry concentration, Economic growth, Inflation

Introduction

In the complex web of a nation's economic landscape, the banking sector stands tall as a pivotal player, responsible for balancing surpluses and deficits through deposit collection and lending activities [1]. The profitability of these banking institutions emerges as a vital lifeline, ensuring a stable and robust financial system, especially during times of crises when economic operations heavily rely on their funding [35]. Peering into the inner workings of bank profitability becomes imperative, shedding light on the stability of the financial sector, its far-reaching impact on stock markets, and the overall economy [31].

The tremors of the global financial crisis in 2008, followed by subsequent seismic events like the COVID-19 pandemic, currency fluctuations, and geopolitical conflicts, have laid bare the vulnerability of the banking sector [31]. Egypt, with its banking industry intricately woven into the fabric of its financial system, finds itself at a crossroads, where unraveling the variables that shape bank profitability becomes the linchpin for ensuring a robust banking system and fostering a thriving economy.

The Egyptian banking system serves as a vital conduit for channeling household savings and a major wellspring of financing for both public and private investments (Central Bank of Egypt 2022). Recent years have witnessed a wave of reforms aimed at enhancing the system's efficiency and competitiveness. Unveiling the primary factors that leave an indelible mark on bank profitability assumes paramount importance for a diverse array of stakeholders, ranging from government entities, central banks, regulators, and shareholders to managers, depositors, and borrowers [3].

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Delving deeper, the determinants of bank profitability can be neatly categorized into two distinct domains: internal factors and external factors. Internally, factors such as capital adequacy, credit risk, bank size, asset structure, non-performing loans, and liquidity weave a complex tapestry. Externally, factors like industry concentration and banking sector development intertwine with macroeconomic factors such as economic growth and inflation, adding further layers of complexity to the puzzle.

This comprehensive research endeavor unfolds across three thought-provoking sections, each paving the way for deeper insights. Firstly, an in-depth literature review embarks on a captivating journey, traversing previous research on the determinants of bank profitability. Secondly, a meticulous exploration of the research methodology and data sources serves as a guiding compass, ensuring the study's robustness. Finally, the study culminates in a crescendo of knowledge, where enlightening conclusions and astute recommendations emerge, forged through the crucible of the study's findings.

Literature review

The performance of banks is extensively analyzed and studied in the financial literature due to the potential influence of various factors on the stability of the banking business worldwide. The primary objective of banks is to achieve a suitable level of profitability while managing an acceptable level of risk. Therefore, this study aims to examine the factors that affect the profitability in Egyptian private banks, including internal and external factors.

In relation to Egypt, it is important to acknowledge the significant political and economic events that the country has experienced in the past decade. These events include the 2007/2008 Crisis in the USA, the Arab Spring, COVID-19, and the Russian–Ukrainian war, all of which had significant financial consequences not only for Egypt but also for the wider region. The services sector was heavily impacted compared to other sectors, which is of great significance to the Egyptian economy. Approximately 70% of the country's foreign exchange earnings were primarily derived from the Suez Canal and tourism [36].

The Arab Spring, which encompassed demonstrations across many Arab nations, was another factor that contributed to political and economic instability. This crisis had a profound impact on Egypt and other countries in the MENA region, resulting in significant consequences for various economic indicators such as tourism, oil prices, inflation rates, gross domestic product, global trade, and foreign direct investment [17]. Despite these challenges, banks in Egypt demonstrated remarkable

strength compared to global and regional counterparts, having previously faced the 2008 crisis and the Arab revolutions. Furthermore, regulatory rules in Egypt underwent important changes over the years in response to these significant events.

Numerous studies have examined the effects of internal and external factors. Internal factors, are influenced by management decisions and internal banking policies. These factors are within the control of bank management and can be modified in response to changing circumstances. Internal factors include bank size, credit risk, capital adequacy, liquidity, non-performing loans, and asset structure. Bank size, measured by total assets using the natural logarithm, has been shown to have a significant positive impact on bank profitability in some studies Isayas [18], Aatamila [1] and Al-Sharkas and Al-Sharkas [2]; while, other studies have found a negative significant relationship O'Connell [28] and Mir and Shah [26].

Credit risk, measured by the ratio of loan provisions to total loans, is an important factor affecting bank profitability. Extensive research has consistently demonstrated that poor asset quality, reflected in non-performing loans, is a primary determinant of bank insolvencies [14]. Some studies have found a positive significant effect of credit risk on bank profitability O'Connell [28] and Syafri (2012); while, others have shown a negative significant relationship Jadah et al. [19], Duarte [5] and Saif-Alyousfi [32]. In the case of Egyptian banks, previous studies have produced mixed results, with some indicating a positive significant effect of credit risk on profitability [20], while others have found a negative significant effect Youssef [39] and El-Ansary and Megahed [7], or no effect at all [8].

Capital adequacy, measured by the ratio of total equity to total assets, is another important determinant of bank profitability. Maintaining adequate capital is crucial for mitigating the impact of crises in the banking and financial sectors [32]. Several studies have found a positive significant effect of capital adequacy on bank profitability Lima [22], Onuorah [29] and Isayas [18]; while, others have shown a negative significant relationship Imane et al. [16] and Gadagbui and Amoah [11]. In the case of Egyptian banks, some studies have reported a significant positive impact of capital adequacy on profitability Kassem and Sakr [20] and El-Ansary and Megahed [7]; while, others have found a negative significant impact Youssef [39] and El-Faham [8].

Liquidity, measured by the loans to deposit ratio, is an essential aspect of bank management. Adequate liquidity enables banks to meet their financial obligations and customer demands effectively [22]. Studies have shown both positive significant effects Lima [22], Hakuduwal [13] and Saif-Alyousfi [32] and negative significant

effects Nayagar [27] and Mercan et al. [25] Referring to previous studies that have shown both positive significant effects and negative significant effects of liquidity on bank profitability. Further analysis is required to determine the specific relationship in the context of Egyptian private banks.

Research conducted by Lima [22], Hakuduwal [13] and Saif-Alyousfi [32] showed a positive significant effect between liquidity on bank profitability. On the other hand, Nayagar [27] and Mercan et al. [25] showed a negative significant effect between liquidity and profitability. Researchers tested the Egyptian banking industry tested the impact of liquidity on bank profitability. Youssef [39] conclude that liquidity has an insignificant negative impact on bank profitability in Egypt. El-Faham [8] showed that liquidity had a significant negative effect on bank profitability.

Non-performing loans (NPLs), which indicate the quality of a bank's loan portfolio, have been found to have a negative impact on bank profitability in numerous studies Jadah et al., [19], Duarte, [5] and Saif-Alyousfi [32]. Higher levels of NPLs can lead to increased provisioning costs, reducing profitability. Asset structure, measured by the ratio of loans to total assets, can also influence bank profitability. Some studies have found a positive significant relationship between asset structure and profitability Gadagbui and Amoah [11] and Lima [22]; while, others have shown a negative significant relationship Saif-Alyousfi [32] and Onuorah [29].

In addition to internal factors, external factors can also impact bank profitability. These factors include market banking concentration, banking sector development, and macroeconomic factors such as economic growth and inflation. Market concentration, measured by the Herfindahl–Hirschman Index (HHI), represents the degree of competition within the banking sector. Studies have found mixed results regarding the impact of market concentration on bank profitability Onuorah [29] and Lima [22]. Some studies suggest a positive relationship, indicating that higher market concentration leads to increased profitability due to reduced competition [22]; while, others have found a negative relationship [29].

Banking sector development, represented by stock market capitalization and private sector credit, is another industry-specific factor that can influence bank profitability. A well-developed financial market provides opportunities for banks to generate higher profits [22]. Studies have shown a positive significant effect of stock market capitalization on bank profitability Jadah et al. [19] and Duarte [5]. Private sector credit, which reflects the level of lending to the private sector, has also been found to have a positive significant impact on bank profitability Onuorah [29] and Gadagbui and Amoah [11].

Macroeconomic factors, such as inflation, interest rates, economic growth, and exchange rates, can also affect bank profitability. Inflation can erode the value of a bank's assets and reduce profitability. Higher interest rates, on the other hand, can increase a bank's net interest margin and profitability. Economic growth is positively associated with bank profitability, as it leads to increased lending opportunities and reduced default rates. Exchange rates can impact banks, especially if they have significant foreign currency exposure. It is important to note that the findings of these studies may vary depending on the specific context, time period, and methodology employed. Therefore, it is recommended to refer to the most recent and relevant research on the determinants of bank profitability in Egyptian private banks for a comprehensive understanding of the subject.

Banking sector development is measured by assessing the total assets of banks concerning the country's Gross domestic product yearly. A negative association is anticipated given the increased rivalry linked to the more established financial industry. Higher bank development is associated with lower bank profitability. The banking industries are often bigger in developed nations. A high ratio of bank assets to gross domestic product suggests that the economy is heavily dependent on financial development [14].

The impact of banking sector development and bank profitability was examined by Yao, Haris and Tariq [38], Shair et al. [33] and Haris et al. [14] and showed a significant negative effect. While, a significant positive effect was conducted by Brahmaiah [4], Owoputi et al. [30] and Tan [34] between banking sector development and bank profitability. On the other hand, the paper conducted by El-Ansary and Megahed [7] showed an insignificant result between banking sector development and profitability.

The Gross Domestic Product can be illustrated as the aggregate value in dollars of all goods and services generated within a nation within a specific period. The Gross Domestic Product (GDP) may have significant impacts on the factors that impact the supply and demand of loans and deposits throughout a nation. When an economy experiences a positive growth rate, both households and firms tend to increase their need for financial transactions [25]. The relationship between GDP and bank profitability was examined by Mercan et al. [25], and Onuorah [29] and concluded that there is a significant positive effect between GDP and profitability of banks. On the other hand, Isayas [18], Hossain and Ahamed [15] and Brahmaiah [4] showed a negative significant effect on GDP and bank profitability.

Inflation is distinguished as the consistent escalation in the overall price level or the consistent decline in the

quantity and quality of goods and services that can be bought with a single unit of currency. The annual inflation rate represents the general increase in the Consumer Price Index (CPI) for all goods and services in a nation [19]. Therefore, the inflation rate is an essential macroeconomic determinant that has an impact on the profitability of banks [18]. The impact of inflation on bank profitability was examined by Mercan et al. [25], Lima [22], and Saif-Alyousfi [32] and showed a positive significant effect between inflation and bank profitability. Jadah et al. [19] and Yao et al. [38] also tested the effect of inflation and bank profitability and found a negative effect between them.

From the previous literature review, the researcher hypothesizes that bank size, capital adequacy, asset structure, economic growth, and inflation have a significant positive impact on private Egyptian bank profitability. Non-performing loan, credit risk, liquidity, banking sector development and banking industry concentration has a significant negative impact on private Egyptian bank profitability. This paper will fill the gap of identifying which determinants affect Egyptian private bank’s profitability from 2013 to 2022.

Methods

This empirical study aims to examine the impact of internal factors (credit risk, capital adequacy, bank size, liquidity, asset structure, and non-performing loans), external factors (banking sector development and industry concentration, macroeconomic factors (economic growth and inflation) on the profitability of private banks in Egypt. The study utilizes a quantitative research method and analyzes secondary data from the annual reports of 15 private banks in Egypt, covering the period from 2013 to 2022. Macroeconomic data are obtained from the Central Bank of Egypt’s data, see Table 6, see appendix.

The research aims to examine the impact of internal factors (credit risk, capital adequacy, bank size, liquidity, asset structure, and non-performing loans), external factors (banking sector development and industry concentration, macroeconomic factors (economic growth and inflation) on the profitability of private banks in Egypt.

Multiple linear regression analysis is used in the study to examine the data and examine the research hypotheses. The profitability of private banks as determined by Return on Assets (ROA) is the dependent variable; while, the 10 profitability factors are the independent variables (see Table 7). Regression assumption analysis is performed to evaluate normality and heteroscedasticity prior to regression analysis, and descriptive analysis is carried out to look at the distribution of the data. Using the Eviews 12 application as an analytical tool, one model

is estimated using multiple linear regression analysis to evaluate hypotheses linked to the significance factors of private bank profitability in Egypt. The models include the following:

The regression equation tests the determinants of private banks’ profitability using ROA as a proxy, The models include the following determinants: capital adequacy (CAP), credit risk (CR), liquidity (LIQ), asset structure (AS), non-performing loans (NPL), bank size (SIZE), industry concentration (CON), banking sector development (BSD), economic growth (GDP), and inflation (INF). The error term is represented by ϵ_{it} .

$$ROA_{it} = \beta_0 + \beta_1CAP_{it} + \beta_2CR_{it} + \beta_3LIQ_{it} + \beta_4AS_{it} + \beta_5NPL_{it} + \beta_6SIZE_{it} + \beta_7CON_{it} + \beta_8BSD_{it} + \beta_9GDP_{it} + \beta_{10}INF_{it} + \epsilon_{it} \tag{1}$$

where ROA -Return on Assets; CAP—Capital Adequacy; CR—Credit Risk; LIQ—Liquidity; AS—Asset Structure; NPL—Non-Performing loans; SIZE—Bank Size; CON—industry Concentration; BSD—Banking Sector Development; GDP—Economic Growth; INF—Inflation and $\epsilon_{i,t}$ is the error term.

A comprehensive summary of the data is generated by descriptive statistical analysis. For every variable the study examines at, important metrics like the mean, standard deviation, maximum, and minimum values are computed. The descriptive analysis’s findings, which show the variables’ properties and distribution, are shown in Table 1. The mean values and standard deviations of all the variables show that there are no outliers and that the distribution of the data is acceptable.

To summarize, this research employs a quantitative methodology to examine the variables influencing the profitability of Egyptian private banks. Multiple linear regression models are used in the analysis, with ROA

Table 1 Descriptive statistics

	Mean	Maximum	Minimum	Std. Dev	Observations
SIZE	10.7250	11.8018	9.8297	0.4142	150
AS	0.8330	0.9218	0.3984	0.0798	150
CR	0.0113	0.0840	-0.0103	0.0133	150
LIQ	0.4907	0.9452	0.1162	0.1549	150
CAP	0.0990	0.1634	0.0386	0.0293	150
NPL	8.0145	56.8500	1.0000	9.4536	150
BSD	20.6378	21.0704	19.9630	0.3611	150
CON	0.5258	0.5354	0.5155	0.0068	150
GDP	4.2100	6.6000	2.4000	1.2268	150
INF	12.0900	29.8000	4.9000	6.6812	150
ROA	0.0214	0.2951	-0.0111	0.0256	150

Data Source: Eviews, Data Processed, 2023

serving as the dependent variable and a range of internal and external factors serving as the independent variables. The results of descriptive statistical analysis shed light on the properties of the variables being studied and guarantee that the data are adequate.

Return on assets (ROA) has an average statistical value of 0.021420, the highest is 0.295113 and the lowest is - 0.0111 with a standard deviation of 0.025646. Bank size has an average statistical value of 10.72500, the highest is 11.8019 and the lowest is 9.8298with a standard deviation of 0.079799. Capital adequacy has an average statistical value of 0.029330, the highest is 0.163385 and the lowest is 0.0386with a standard deviation of 0.029330.

Credit risk has an average statistical value of 0.011329, the highest is 0.084019 and the lowest is - 0.0103with a standard deviation of 0.013294. Liquidity has an average statistical value of 0.490684, the highest is 0.945194, and the lowest is - 0.1162with a standard deviation of 0.154933. Asset Structure has an average statistical value of 0.832967, the highest is 0.921803, and the lowest is 0.3984 with a standard deviation of 0.079799. NPL has an average statistical value of 8.014483, the highest is 56.85000, and the lowest is 1.000 with a standard deviation of 9.453578.

Banking Sector Development has an average statistical value of 20.6378, the highest is 21.0704, and the lowest is 19.9630 with a standard deviation of 0.3611. Industry Concentration has an average statistical value of 0.5258, with the highest is 0.5354 and the lowest is 0.5155 with a standard deviation of 0.0068. GDP has an average statistical value of 4.210000, with the highest 6.600000 and the lowest 2.4000 with a standard deviation of 1.226757. Inflation has an average statistical value of 12.09000, with the highest] 29.80000 and the lowest 4.9000 with a standard deviation of 6.681204.

Table 2 clearly shows that, with the exception of asset structure, industry concentration, and inflation, the most of the independent factors have a significant positive or negative impact on profitability. Bank profitability is positively and strongly connected with bank size, capital adequacy, and banking sector development. On the other hand, credit risk, liquidity, and non-performing loans (NPLs) are adversely and significantly correlated with return on assets (ROA).

The Jarque–Bera technique is used to determine whether or not the gathered data follow a normal distribution. The data gathered is not normally distributed if the Jarque–Bera Probability value is less than the probability value of 0.05. On the other hand, it can be said that the data used is normally distributed if the Jarque–Bera Probability value is higher significant than 0.05 (Winarno 2015).

Table 3 show that the Jarque–Bera value method value is 0.0000, which is less than 0.05, indicating that the data for bank profitability is not normally distributed.

In a linear regression model, the heteroscedasticity test is used to determine whether there are variance differences from the residuals for all observations. If the significant level is $p > 0.05$, it indicates that there is no heteroscedasticity problem, and if the $p < 0.05$, it indicates that there is.

Table 4 demonstrate that the model has a heteroskedasticity problem because of the significant correlation

Table 2 Shows the correlation matrix of dependent and independent variables

Correlation Probability	SIZE	AS	CR	LIQ	NPL	CAP	BSD	CON	GDP	INF	ROA
SIZE	1.0000										
AS	0.0510	1.0000									
CR	-0.0424	-0.0030	1.0000								
LIQ	-0.1057	-0.4481***	-0.1044	1.0000							
NPL	-0.2462***	0.1874**	0.0522	-0.2023**	1.0000						
CAP	0.0384	-0.2409***	-0.1082	-0.0166	-0.1362*	1.0000					
BSD	0.5206***	0.0729	0.0612	-0.0638	-0.2926***	0.0987	1.0000				
CON	0.0092	-0.0868	-0.0299	0.0253	0.0135	-0.0664	-0.0497	1.0000			
GDP	0.2431***	-0.0020	-0.0885	-0.0262	-0.1153	-0.0182	0.4103***	0.2698***	1.0000		
INF	0.0071	-0.0023	0.1997**	-0.0463	0.0051	-0.2015**	0.0997	-0.2952***	-0.1649**	1.0000	
ROA	0.2786***	-0.0811	-0.1986**	-0.1786**	-0.1942**	0.3107***	0.1965**	0.0521	0.2032**	0.0797	1.0000

Data Source: Eviews, Data Processed, 2023

Table 3 Jarque–Bera Normality Test—ROA

	Statistic	Probability	Mean
Jarque–Bera	36,848.15	0.0000	7.71

Data Source: Eviews, Data Processed, 2023

Table 4 Heteroskedasticity Test—ROA

	Value	Probability
Likelihood ratio	348.86	0.0000

Data Source: Eviews, Data Processed, 2023

Table 5 Estimations Results Panel GLS

Variables	Regression
	ROA
C	0.037477
SIZE	0.08062***
AS	-0.010777
CR	-0.170846**
LIQ	-0.015746**
NPL	-0.00290***
CAP	0.207060***
BSD	-0.002941
CON	-0.100065
GDP	0.001191**
INF	0.000478***
R-squared	0.589428
F-statistic	19.95524
Probability F-Statistic	0.000000
Durbin-Watson stat	0.957113

Data Source: Eviews, Data Processed, 2023

in the error term for the profitability of private banks in Egypt. The results of the heteroskedasticity test show that the likelihood ratio is 348.86 and its probability is 0.000. The generalized least squares (GLS) model is examined in order to address the heteroskedasticity and normality problems found in the data.

Based on the GLS Model in Table 5, capital adequacy, bank size, credit risk, liquidity, NPL, economic growth, and inflation have a significant effect on the profitability of Egyptian private banks. Bank size has a significant positive effect on Egyptian private bank profitability, which means if bank size increases by 1%, bank profitability also increases by 0.08% with a significance correlation of 1%. Credit risk has a significant negative effect on the Egyptian private banks' profitability, which means that when credit risk increases by 1%, private banks profitability will decrease by 0.171%, with a significant level of 5%. Liquidity has a significant negative impact on Egyptian private banks, as a 1% increase in liquidity reduces bank profitability by 0.0157, which is significant by 5%. Moreover, non-performing loans have a significant negative effect on the Egyptian private banks' profitability, as a 1% increase in NPL will lead to a decrease in bank profitability by 0.0029% with a significant level

of 1%. The outcome of the GLS model showed a positive significant effect between capital adequacy and Egyptian private banks' profitability, as an increase in capital adequacy by 1% bank profitability will also increase by 0.2% with a significance level of 1%. Also, GDP and inflation have a significant positive effect on the Egyptian private banks' profitability. As the results showed, GDP increases will enhance bank profitability by 0.00119% with a significance level of 5%. However, when Egyptian inflation increases by 1%, banks' profitability will also increase by 0.000478%, with a significance level of 1%. Furthermore, the outcome showed that asset structure, banking sector development, and industry concentration have an insignificant effect on private Egyptian banks profitability.

Results

The present study discovered a positive relationship between bank size and the performance of Egyptian private banks. The profitability of a bank is influenced by its size due to the advantages of economies of scale. Larger banks are capable of distributing fixed costs more efficiently, resulting in lower average costs per unit of output and increased profitability. Moreover, a larger asset base enables greater lending opportunities and higher interest earnings, which further contribute to enhanced profitability. A strong market reputation and creditworthiness also attract capital, deposits, and investments, bolstering the bank's economic position and ultimately leading to increased profitability. These findings align with earlier studies conducted by Hakuduwal [13], Jadah et al. [19], Aatamila [1], and Isayas [18], which provide additional evidence supporting the positive and significant impact of bank size on profitability. However, the results of the current research contradict the findings of O'Connell [28] and Mir and Shah [26], who suggested a negative association between bank size and profitability.

The result outcome of capital adequacy which has a positive significant effect on the Egyptian private banks can be explained by Capital adequacy in banks increases profitability by providing a safety asset against unforeseen losses. This attracts investors, who view banks as safe investments, leading to higher stock prices and easier access to capital markets. Private banks in Egypt can absorb losses without negatively affecting solvency, ensuring long-term profitability. Furthermore, sufficient capital allows banks to pay dividends to shareholders, which attract new investors and increase profits. This positive relationship between capital adequacy and profitability highlights the importance of capital in financial stability. This result is in the line with those previous studies Lima [22], Onuorah [29], Saif-Alyousfi [32], Kassem and Sakr [20], which further support that capital adequacy has a positive significant impact on banks

profitability. However, the findings of the current study do not support the previous research conducted by Guerreiro [12], Imane et al. [24], who stated that there is a negative association between capital adequacy and banks profitability.

Credit risk was found to have a negative effect on the Egyptian private banks profitability. Egypt's banking sector faces a negative relationship with credit risk due to increased defaults on loans, which can lead to significant losses and decreased profitability. Banks in Egypt must classify certain loans as non-performing, which do not generate interest revenue. This results in increased provisioning expenses, which directly affect the bank's profitability. The interest rate environment also plays a role in the negative impact of credit risk, as changes in interest rates can increase debt servicing costs and increase the number of non-performing loans. Currency risk is another factor, as banks with a significant portion of their loans denominated in foreign currencies may be exposed to it. Additionally, an increase in credit risk indicates poor asset quality, leading to increased bankruptcy risk and higher interest rates on deposits. This result is in the line with those previous studies Jadah et al. [19], Saif-Alyousfi [32], which further support that credit risk has a negative significant impact on banks profitability. However, the findings of the current study do not support the previous research conducted by O'Connell [28] and Syafri (2012), who stated that there is a positive association between credit risk and banks profitability.

The outcome of GLS model showed that liquidity has a negative significant effect on the Egyptian private bank profitability. The negative relationship between liquidity and profitability in Egyptian private banks may be due to idle funds and excess liquidity. Banks with high credit risk may borrow more money to fund loans, which negatively impacts profitability. Borrowed money is often more expensive than customer deposits, leading to higher costs and making it difficult to turn a profit from lending operations. Additionally, banks may be at risk if they depend too much on borrowed money, particularly if interest rates or the economy change. Despite loans being necessary for making money, excessively high liquidity without a strong deposit base can hinder the bank's ability to generate profit. This result is in the line with those previous studies by [7, 8, 27], which further support that liquidity has a negative significant impact on banks profitability. However, the findings of the current study do not support the previous research conducted by Hakuduwal [13], Fidanoski et al. [10], who stated that there is a positive association between liquidity and banks profitability.

Non-performing loans (NPLs) negatively impact Egyptian private banks due to reduced interest income, missed or delayed interest payments, and increased provisions

for loan losses. These loans can also affect market perception, as high percentages of NPLs indicate low asset quality and negatively impact a bank's stock price and cost of capital. The opportunity cost of a high level of NPLs may also be a factor, as resources allocated to NPLs could have been used more profitably in other aspects. Banks could have generated more interest revenue by making new loans to creditworthy borrowers with the capital held in NPLs. Therefore, NPLs may have a negative impact on Egyptian private banks' profitability. This result is in the line with those previous studies by Al-Sharkas and Al-Sharkas [2], Maltaş [23], Onuorah [29]; which further support that NPL has a negative significant impact on banks profitability. However, the findings of the current study do not support the previous research conducted by Adelopo et al. (2022); and El Mahdy [6] who stated that there is a positive association between NPL and banks profitability.

Egyptian private banks' profitability is positively influenced by inflation, as it leads to higher interest rates and higher income. This is due to the government's inability to stimulate economic growth and the potential for higher inflation to decrease people's purchasing power, leading to increased export costs and less competitive export products. Lending is the primary source of income for private banks, and higher interest rates can increase profit margins. Inflation in Egypt can be fully anticipated due to political risk and unstable regional conditions, allowing banks to adjust interest rates accordingly, resulting in faster revenues and higher profits. This suggests that the government's efforts to control and stimulate economic growth are crucial for maintaining profitability in the Egyptian banking sector. This result is in the line with those previous studies by Mercan et al. [25], Lima [22], and Isayas [18] which further support that inflation has a positive significant impact on banks profitability. However, the findings of the current study do not support the previous research conducted by Jadah et al. [19], and Brahmaiah [4], who stated that there is a negative association between inflation and banks profitability.

In this study, economic growth was found to have positive effect on the Egyptian private banks profitability. Egyptian private banks' profitability is positively correlated with GDP growth, driven by the increasing demand for credit and the growth of businesses and individuals seeking loans for housing, education, and other needs. This increased demand for credit can lead to higher interest income for banks, particularly those focusing on retail banking. Additionally, increased consumer spending, which is often correlated with economic growth, can benefit private banks by resulting in more transactions and fees. Central banks often increase interest rates to control inflation, allowing banks to charge higher interest

rates for loans, improving their net interest margins and potentially benefiting those with significant loan portfolios. This result is in the line with those previous studies by Saif-Alyousfi [32], Adelopo et al. (2022), Onuorah [29], which further support that GDP has a positive significant impact on banks profitability. However, the findings of the current study do not support the previous research conducted by Isayas [18], Hossain and Ahamed [15], and Brahmaiah [4], who stated that there is a negative association between GDP and banks profitability.

The outcome of the GLS showed an insignificant effect between assets structure, banking sector development and banking industry concentration and the Egyptian private banks profitability.

The insignificant relation between assets structure and the Egyptian private banks is due to the narrow interest rate spread and the diversification of assets of banks. Egyptian banks charge more interest on assets like loans than on liabilities, which may not fully represent their profitability due to economic conditions, monetary policy, and market forces. The overall effect of the asset structure may be less noticeable due to the well-diversified portfolio of high-quality loans and securities in Egyptian private banks. This result is in the line with those previous studies by Hossain and Ahamed [15], and Al-Homaidi et al. (2018), which further support that asset structure has an insignificant effect on bank profitability. However, the findings of the current study do not support the previous research conducted by O'Connell [28], Hakuduwal [13], El-Ansary and Megahed [7], who stated that asset structure has a significant effect on bank profitability.

The GLS model reveals that the profitability of Egyptian private banks is not significantly influenced by the development of the banking sector. This is due to global and geopolitical factors, such as economic downturns, geopolitical tensions, and unexpected market shifts, which are often beyond the control of individual banks. Additionally, the diversification of services also plays a role in determining the profitability of Egyptian private banks. The profitability of banks is influenced by their ability to offer a diverse range of financial services, manage risks effectively, and adapt to changing market conditions. The research only focuses on 15 private banks out of 37 banks in Egypt, suggesting that the total banking sector may affect the profitability of Egyptian banks. This result is in the line with those previous studies by El-Ansary and Megahed [7], which further support that Egyptian private banking sector development has an insignificant effect on bank profitability. Another reason might be that according to Enterprise [9], following the reduction of Egypt's sovereign credit rating in November 2023, Fitch Ratings has reduced the operational environment score of four

major Egyptian banks because of their large exposure to sovereign debt. The ratings of Banks were amended from negative to stable, and their scores were dropped from 'B' to 'B-'. Because of the association between banks and sovereign profiles, nearly half of the assets in Egypt's banking system are invested in government debt, which presents a serious risk. Due to the currency crisis, investor confidence has declined, which is preventing foreign exchange inflows and anticipating a negative net foreign asset position for the banking industry by 2024. According to Fitch's head of Middle East Bank Ratings, Egypt's GDP growth prediction for FY 2023–2024 is expected to be 3.5% lower than previously projected due to rising inflation, currency pressure, and political uncertainties that are affecting investor confidence. However, the findings of the current study do not support the previous research conducted by Onuorah [29], Haris et al. [14], and Tan [34], who stated that banking sector development has a significant effect on bank profitability.

The banking industry concentration in Egypt does not significantly impact the profitability of private banks. This is due to effective regulatory oversight, which prevents abuses of market power and ensures fair competition. Well-regulated markets allow banks of all sizes to thrive without undue negative effects on smaller competitors. Bank profitability is influenced by customer preferences and loyalty, regardless of industry concentration. Strong customer relationships and adapting to changing needs are key components of a bank's success in various market structures. Strategic alliances and partnerships can also contribute to this result, as banks of all sizes can enter into these partnerships to expand their capabilities and reach new markets, reducing the effects of industry concentration. This result is in the line with those previous studies by Gadagbui and Amoah [11] and Tan [34], which further support that Egyptian private banking sector development has an insignificant effect on bank profitability. However, the findings of the current study do not support the previous research conducted by O'Connell [28], Saif-Alyousfi [32] and El-Ansary and Megahed [7] who stated that banking sector concentration has a significant effect on bank profitability.

Conclusion

This study explored the factors that drive profitability for private banks in Egypt, leaving no stone unturned. The results we uncovered shed light on the intricate relationships between internal factors and external factors and their impact on the profitability of private banks in Egypt. The findings painted a vivid picture of what makes a private bank thrive in Egypt. The study's findings indicate that a number of variables significantly affect the profitability of Egyptian private banks. These variables include

inflation, economic growth, non-performing loans (NPL), bank size, credit risk, liquidity, and capital adequacy. The profitability of Egyptian private banks is positively and significantly impacted by capital adequacy, bank size, economic growth, and inflation. On the other hand, the profitability of Egyptian private banks is adversely and significantly impacted by credit risk, liquidity, and non-performing loans. The study also discovered that the profitability of Egyptian private banks is not significantly impacted by the development of the banking sector, industry concentration, or asset structure.

The GLS model supported that capital adequacy, bank size, economic growth, and inflation have a positive and significant impact on the profitability of Egyptian private banks; while, credit risk, liquidity, and non-performing loans have a negative and significant impact on their profitability, which all confirmed the study hypotheses. On the other hand, an asset's structure, banking sector development, and industry concentration have a negative, insignificant impact on the profitability of Egyptian private banks. In essence, the study provided a captivating narrative that showcased the vital factors influencing the profitability of private banks in Egypt. It is a tale of capital strength, bank size, economic prosperity, inflation dynamics, credit risk challenges, liquidity struggles, and the battle against non-performing loans. By understanding and navigating this intricate landscape, private banks can script their own success stories in the Egyptian financial realm.

Discussion

The study has opened the door to several avenues of further research that can deepen our understanding of private banks' profitability in Egypt. One area worth exploring is the influence of additional determinants on bank profitability. Factors for example as corporate governance, Strategic decision-making and risk management techniques are influenced by corporate governance, which includes a bank's leadership and supervision procedures' efficacy and structure. Interest rates have a significant influence on the cost of borrowing money and the yield on assets, which in turn has an impact on the net interest margin and overall profitability. Operational efficiency can reduce expenses and increase profitability. It is determined by how well a bank's internal procedures work. The ratio of operational expenses to revenue is represented by the cost-income ratio; a lower ratio denotes improved profitability and better cost control. Offering a range of financial products and services leads to revenue diversification, which reduces the risk of fluctuations in certain markets or economic conditions. This helps banks maintain long-term profitability and overall financial stability. Investigating the impact of these factors can provide valuable insights into their relevance within the Egyptian private banking sector.

Furthermore, it is recommended to employ alternative measures of profitability, such as net interest margin (NIM), return on equity (ROE) or Tobin's q , in future studies. Comparing the results obtained from these measures with those obtained from return on assets (ROA) can offer a more comprehensive and nuanced understanding of the factors influencing bank profitability.

To gain a broader perspective, it would be valuable to compare the profitability of banks in both developed and developing countries. This comparative analysis can help determine if the identified determinants hold similar importance across different economic contexts. By examining the similarities and differences, researchers can gain a more robust understanding of the factors driving bank profitability. Moreover, exploring the disparities between private and public banks in terms of profitability and their relationship with internal and external factors can provide valuable insights. Because private and public banks have different ownership structures, goals, and operational freedom, their profitability frequently differs. The need to provide returns for its shareholders motivates private banks, which are privately held and run with a major focus on profit maximization. Due to their focus on profits, private banks implement competitive strategies that prioritize efficiency, innovation, and taking calculated risks in order to obtain a competitive advantage in the market. Their choices are typically more flexible and sensitive to the dynamics of the market, which enables them to act quickly in response to shifting market conditions and seize new possibilities [37].

However, because they are controlled by the government or subject to their authority, public banks might put social goals ahead of their own financial interests. Public banks frequently support public projects, encourage financial inclusion, and advance economic development. These ethical obligations may therefore have an impact on its profitability, which could result in a shift in risk tolerance, investment approach, and operational priorities. Public banks may not be able to make decisions as quickly or as effectively as private banks due to bureaucratic processes and government regulations, which adds layers of complexity to their decision-making processes [21]. Understanding the impact of ownership structure on bank profitability is crucial for policymakers and stakeholders in the banking sector.

In summary, while the current study has shed light on significant factors of private banks' profitability in Egypt, there are still exciting avenues for further research. Exploring additional factors, utilizing a variety of profitability measures, and conducting comparative analyses can contribute to a more comprehensive understanding of bank profitability in the Egyptian banking sector.

Appendix

See Tables 6, 7.

Table 6 Research Variables and Measurements

	Variables	Measurements	Notations
Dependent Variables	Bank Profitability	ROA = Net Income/Total Assets	ROA
Independent Variables	Bank Size	Log of Total Assets	SIZE
	Capital Adequacy	Total Equity/Total Assets	CAP
	Credit Risk	Loan loss provisions/ Total loans	CR
	Liquidity	Loans/Deposits	LIQ
	Asset Structure	Total Deposits/Total Assets	AS
	Non-Performing Loans	Non-performing loans/ Total Loans	NPL
	Concentration	Total Assets of largest 3 / Total Assets of the whole industry	CON
	Banking Sector Development	Total Banks Assets/ GDP	BSD
	Economic Growth	GDP growth Rate	GDP
	Inflation	Inflation Rate	INF

Source: Prepared by the Author

Table 7 List of Selected Egyptian Private Banks

	Name of Banks	Observations
1	Commercial International Bank	10
2	Housing and Development Bank	10
3	Bank of Alexandria	10
4	Suez Canal Bank	10
5	Egyptian Gulf Bank	10
6	Faisal Islamic Bank of Egypt	10
7	Abu Dhabi Islamic Bank	10
8	Arab Banking Corporation	10
9	HSBC Bank Egypt	10
10	Al Ahli Bank of Kuwait—Egypt	10
11	Abu Dhabi Commercial Bank—Egypt	10
12	Crédit Agricole Egypt	10
13	Qatar National Bank—Egypt	10
14	Al Baraka Bank Egypt	10
15	National Bank of Kuwait—Egypt	10
	Total	150

Source: Prepared by the Authors

Abbreviations

SIZE	Bank size
CAP	Capital adequacy
CR	Credit risk
LIQ	Liquidation
NPL	Non-performing loans
AS	Asset structure
CONC	Concentration
BSD	Banking sector development
GDP	Economic growth (growth domestic product)
INF	Inflation
ROA	Return on assets

ROE	Return on equity
CBE	Central Bank of Egypt

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Author contributions

All authors contributed to the completion of this article from conceptualization to the concluding remark. Hence, we have read and approved the manuscript. DS designed and drafted the work and substantively revised it. YA responsible for the analysis and interpretation of data. All authors have read and approved the manuscript.

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Declarations

Ethics approval and consent to participate

All authors declare that there are no potential risks or burdens associated with this study and we took the approval of the participant prior to do the study. All the comments and views are related to the author not for the institution working in it.

Consent for publication

All authors declare that there are no potential risks or burdens associated with this study and we took the approval of the participant prior to do the study.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. The data used for this research sourced from the primary research and the results are available.

Competing interests

The authors declare that they have no competing interests. Not applicable.

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