Profitability Determining Factors of BANKING: Evidence from Egypt

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Abstract

This study investigates the determinants of bank profitability in Egypt, as emerging market, over the 2015–2024 period. Leveraging a panel data from 12 listed Egyptian banks in EGX, the study analysis the differential impact of bank-specific, macroeconomic, and regulatory factors on two key performance metrics: Return on Assets (ROA) and Return on Equity (ROE). The study found reveal a complex, dialectical interplay between internal bank resilience and external macroeconomic vulnerability. For ROA, asset utilization is strongly driven by macroeconomic stability, with GDP growth exerting a significant positive effect, while asset quality, as measured by Non-Performing Loans (NPLs), remains a critical negative determinant. Prudent liquidity management, indicated by the Loan-to-Deposit Ratio (LDR), and regulatory stability, signaled by the Required Reserve Ratio (RRR), also positively contribute to ROA. In contrast, ROE, which captures shareholder returns, is significantly influenced by monetary policy (negatively by Interest Rates) and strategic positioning (positively by Bank Style, e.g., Islamic or specialized banks). Notably, dollarization acts as a hedge for equity holders, positively impacting ROE, while Environmental Activities (EA) and bank Age impose short-term costs, negatively affecting both ROA and ROE. These results underscore that profitability in Egypt's dynamic banking sector is not monolithic; it requires a delicate balance between rigorous credit risk management, strategic differentiation, macroeconomic navigation, and a phased, value-driven approach to modernization and ESG integration. The study offers actionable insights for bank managers, regulators, and investors to enhance financial stability and foster sustainable growth in emerging markets.

Keywords

Profitability banking**;** Return on Assets (ROA); Return on Equity (ROE); emerging market; Egypt

1. Introduction

Demonstration of banks is an important factor affecting the stability and development of financial systems, especially in emerging markets where economic instability, regulatory changes and challenges of development are pronounced (Levine, 1997). Understanding bank performance determinants in these contexts is necessary for policy makers, regulators, investors and bank managers who aim to increase financial stability and promote economic growth (Ozili, 2018; Bozic and Bozic, 2025). The paper focuses on the discovery of major determinants of banks' performance in emerging markets with specific empirical evidence from the Egyptian banking sector, which is one of the most important and dynamic banking environments in the Middle East and North Africa region.

In emerging markets such as Egypt, banks work in a complex environment with rapid economic growth, financial liberalization and developed regulatory structure. These conditions provide opportunities, but also cause risk, affecting the profitability, efficiency and market evaluation of banks. Various financial matrix - such as returns on assets (ROA) and returns on equity (ROE) are used to evaluate bank performance by reflecting profitability, operational efficiency and market expectations respectively (Azzabi & Lahrichi, 2024). The determinants of these performance measures can be broadly classified into three groups: bank-specific factors, macroeconomic variables, and regulatory and operational factor (Grigorian and Manole, 2006; O'Connell, 2023). Recently, digital changes have emerged as an additional important dimension affecting banking performance in emerging economies.

Bank-specific features are among the largest scale studied determinants of performance. One of these is a bank size, which is the principle for generating economies of the scale, increasing market power and better risk diversification, which has improved profitability and stability (Berger & Bouwman, 2013; Athanasoglou et al., 2006). Larger banks often have higher access to capital markets and a comprehensive customer base, which contributes to high income and flexibility against economic tremors (Azzabi & Lahrichi, 2024; El-Ansary & Megahed, 2024). However, excessive growth can lead to bureaucracy disabilities and may reduce returns, a challenge recognized in some studies (Bahyaoui, 2017).

Another determinant debt growth shows the main function of banks in providing credit to the economy. Moderate loan expansion usually increases profitability by increasing interest income, while over-expansion increases the risk of non-performing loans (NPL), reduces banks' financial health (Fahlenbrach et al., 2018). Research in terms of Egypt confirms that debt growth is positively correlated when managed prudent when managed, but can become a source of vulnerability when NPLS increases (Wagdi & Salman, 2022). The NPL ratio is widely documented to affect bank performance (Ghosh, 2015; Naili & Lahrichi, 2022), to affect bank performance by increasing the credit risk and asset quality and reduce the earnings by increasing the earnings and reducing the earnings.

Operating efficiency measured by cost-to-I ratio, similarly required. Skilled banks achieve better profitability through cost management and revenue adaptation (Vidyarthi and Tiwari, 2020; Rakshit, 2023). This relationship is compatible in emerging markets including Egypt, where operational reforms have helped banks to maintain development and deal with competitive pressures (Azzabi & Lahrichi, 2024). However, some evidence points to context-specific factors such as the quality of management affecting the strength of this linkage (Chouikh & Blagui, 2017).

Macroeconomic conditions severely shape the bank's performance by affecting the economic environment in which banks operate (Ahmed et al., 2021). The GDP growth rate positively affects banking profitability by increasing growth rate demand and improving borrowers' capacity to repay loans (Sufian & Habibullah, 2009). However, during the period of high volatility or recession, this relationship may weaken. The recent economic expansion of Egypt matches the performance of the better banking sector, showing the importance of macroeconomic stability (Wagdi & Salman, 2022).

Monetary variables such as broader wealth growth promotes liquidity and availability of debt, promoting bank revenue in emerging economies (Sufian, 2018). Nevertheless, highly monetary expansion can promote inflation, increase the cost of money and reduce the quality of the asset. The interest rate environment also plays a complex role; Long-term rates are generally beneficial as they widen borrowed margins, while short-term rates can increase bank funding expenses (BIS, 2020). Egyptian reforms have highlighted how monetary policy directly affects banking profitability.

Regulatory factors create an important framework for taking risk of banks and affecting performance (Oyeniyi et al., 2021; Audi and Al-Masri, 2024). Capital adequate requirements and reserved mandate ensure that banks maintain financial jerks and bolt systemic stability (Wagdi & Salman, 2022). Empirical findings of emerging markets suggest that well-capitalized banks have better funding costs and investors' confidence (El-Ansary & Megahed, 2024). Concurrent, credit risk management practices that strengthen NPLS less profitability and protect banks from deficit (Azzabi & Lahrichi, 2024).

In recent years, digital changes have emerged as an important driver of banking performance. The Covid-19 epidemic accelerate digital banking, which increases operating efficiency, wider the customer access, and strengthens financial inclusion (Azzabi & Lahrichi, 2024). Metrix gauge digital progresses such as increase in bank accounts, adopting cashless payments, internet penetration, and mobile membership. Studies show that digital maturity improves profitability and competitive status, although challenges remain related to investment costs and cyber security (Potapova et al., 2022; Forcadell et al., 2020).

Egypt's banking sector displays unique regional characteristics affecting performance. Public sector banks, private institutions, and Islamic banks show discriminatory profitability trends, which are affected by ownership structures, strategic attention and regulatory environment (Elatroush, 2023). The initiative of financial inclusion, which offers the new revenue route, for the purpose of integrating the undested population, but also increases operational challenges (Mohamad, 2022). Market concentration and competition levels affect the market power and pricing of banks, affecting profitability (Chaffai and Coccorese, 2023; Herwald et al., 2024).

The study contributes to growing literature by analyzing a broad set of determinants from economic, regulatory, operations and technical dimensions within the Egyptian banking industry from 2015 to 2024. It employs strong economical techniques to assess the relative effects on the ROA and ROE, which provides the necessary insight to stakeholders with the aim of customizing bank performance in emerging markets.

2. Literature Review

The performance of banks in emerging markets has been the focal point of both research and policy making due to its important role in promoting sustainable economic growth and financial stability (Levine, 1997; Cole et al., 2008). Emerging markets, characteristic of rapid economic changes, develop regulatory landscapes, and variables provide institutional quality, a complex environment where bank performance is affected by several interaction factors (Azzabi & Lahrichi, 2024). This literature review synthesizes existing research on bank performance determinants, which gives special attention to the evidence of Egypt and comparable emerging economies.

2.1 Conceptualizing Bank Performance Metrics

Bank performance is usually measured using financial ratio which reflects profitability, efficiency and market evaluation. The most widely used indicators of Return on Assets (ROA) and Return (ROE) on Equity. The ROA measurement involves how the bank uses its property to generate effective profits; Roe holds profitability in relation to the capital of shareholders, providing insight on the price joint for the owners;, reflect the investors' perceptions. This matrix has enabled widespread empirical investigation into the underlying determinants of the performance in emerging banking systems.

2.2 Bank-Specific Determinants

A. Bank Size and Market Power

One of the most studied internal factors affecting bank performance is the bank size. Large banks are envisaged to enjoy the economy of scale and scope, diversification benefits, and increase market power, leading to better profitability results (Berger & Bouwman, 2013; Athanasoglou et al., 2006). Empirical studies in emerging markets including Egypt, usually support this hypothesis. Azzabi and Lahrichi (2024) found that large banks in the Mena region demonstrate better operating performance, which benefit from funding and widespread access to customers. Similarly, Wagdi and Salman (2022) suggest that the size of Egyptian banks positively connects with ROE, suggests that the benefits of the scale translate into extended profitability. However, in some contexts in some contexts due to the incapacity and managerial complications in mega-banks, low returns are reported, exposing

that size is insufficient without operating efficiency alone (Bahyaoui, 2017; Seiford & Zhu, 1999; O'Connell, 2023).

B. Asset Quality: Non-Performing Loans and Credit Risk

The ratio of non-demonstration loans (NPLS) is an important measure of property quality and bank performance is a major determinant. High NPL ratio provisions reduce the condition of spending, depression, and banks' capital, reducing profitability and lending capacity (Ghosh, 2015; Naili & Lahrichi, 2022). Emerging markets experience high credit risk due to economic instability and regulatory challenges. In Egypt, the empirical evidence confirms the growing NPL's negative impact on the growing NPL's growing NPL on profitable indicators such as ROA (El-Ansary & Megahed, 2024; Wagdi & Salman, 2022). However, some studies indicate effective risk management and recovery mechanisms that can reduce short -term growth in NPL and preserve bank profitability (Rajan, 1994; Anastasiou, 2023).

C. Loan Growth and Liquidity Management

Debt growth refers to the bank's credit expansion activity, which can increase profitability through increased interest income, but if the increase is highly or unabated (Fahlenbrach et al., 2018; Dang, 2021). Conclusions in emerging markets reveal a fine effect: moderate debt growth is positively correlated with demonstration metrics, while uncontrolled growth increases credit risk (El-Ansary & Megahed, 2024). In Egypt, loan-to-deposit ratios are important operating variables affecting liquidity and earning capacity. Banks that maintain optimal loan-to-deposit ratios improve profitability and avoid lack of liquidity that disrupted lending (Wagdi & Salman, 2022).

D. Operational Efficiency and Cost Management

Operating efficiency is a central determinant of bank performance. Efficiency profit reduces operating cost relative to income, directly increases profitability (Pasiouras & Kosmidou, 2007). Emerging economies including Egypt indicate strong negative correlations between empirical functions, disability and bank financial performance (O'Connell, 2023; Azzabi & Lahrichi, 2024; El-Ansary & Megahed, 2024). However, the quality of operational efficiency management is affected by the adoption of technology and competitive pressures, making it a versatile determinant.

E. Ownership Structure and Bank Type

The ownership structure affects the consequences of public, private domestic, or foreign-bank regime, risk-taking behavior and performance. Studies indicate that private and foreign banks generally demonstrate high efficiency and profitability due to more stringent governance and advanced risk management practices (Ben Zeineb and Mensi, 2018; O'Connell, 2023; Elatroush, 2023). Public banks, while sometimes less efficient, perform decisive developmental roles and can be subject to various regulatory and social mandate. The Islamic banks, which work under Sharia law, also show different performance profiles associated with their unique financing structures (Wagdi & Salman, 2022). Egyptian banking studies confirm that ownership affects the dynamics and operational focus of the risk-witness of banks.

2.3 Macroeconomic Determinants

A. Economic Growth and Financial Development

Macroeconomic factors have a profound impact on the performance of the banking sector. GDP growth is positively associated with banking profitability as economic expansion increases credit demand and reduces omissions (Sufian & Habibullah, 2009; Jara-Bertin et al., 2014). This relationship is prominent in Egypt, where the period of continuous economic development corresponds to better bank financial indicators (Wagdi & Salman, 2022). The financial sector is measured through indicators such as the development of the financial sector, banking penetration and liquidity, supporting the bank performance by deepening the markets and enabling diverse financial mediation (Azzabi & Lahrichi, 2024).

B. Inflation and Interest Rate Environment

Inflation affects the bank profitability by affecting the interest rate dissemination and the actual value of assets and liabilities. High inflation can destroy property values and increase funding costs, compress margin (BIS, 2020). Interest rates, especially short-term versus long-term rate composition, pure interest affects margin and revenue stability (Wagdi & Salman, 2022). In Egypt, the interest rate liberalization and monetary policy changes have had an average impact on bank profit dynamics (Shokr, 2020).

C. Exchange Rate Volatility and Dollarization

In emerging markets, including Egypt, high exchange rates represent volatility and deposit dollar representing additional risks that affect bank performance. Dollarization, the practice of conducting foreign exchange deposits, creates liquidity and exchanges the risk management challenges, but also affects interest structures and money costs. Wagdi and Salman (2022) show that both ups and downs in the exchange rate affect Egyptian banks' performance matrix, which reflect the impact of external economic shocks on domestic banks.

2.4 Bank Regulatory and Supervisory Framework

Capital adequacy requirements and reserved ratio are fundamental regulatory equipment aimed at promoting the stability of the banking sector. High capital ratio increases the shock absorption capacity of banks and the cost of low funds, which improves profitability (El-Ansary & Megahed, 2024; Majumder & Li, 2018). Reserve requirements control liquidity and credit growth, affecting banks' operational flexibility and income capacity. Egyptian banks face specific regulatory challenges related to basal III compliance and capital restructuring, affecting their performance (Wagdi & Salman, 2022).

Risk-based supervision and governance practices also significantly modify the bank's performance. Better governance is reduced by excessive risk and improves financial results, although intervals persist in emerging economies due to institutional weaknesses (Azzabi & Lahrichi, 2024).

2.5 Digital Transformation and Technological Innovation

Recently, digital banking and financial technology (Fintech) innovations have become important determinants of bank performance in emerging markets. The Covid-19 epidemic accelerated digital adoption, encouraging banks to avail mobile banking, online payment, and increased efficiency and automation for outreach (Azzabi & Lahrichi, 2024). Digital penetration measured through bank account growth, cashless payment volume, and internet/mobile membership rates is positively correlated with profitability and competition in emerging banking sectors (Potapova et al., 2022). However, adequate investment and cyber security risk face challenges for continuous digital changes (Forcadell et al., 2020).

In the MENAP region, including Egypt, the integration of digital banking services has already provided outreach for the unbanked population, as well as supporting the financial inclusion initiative, increasing the operational complexity (Azzabi & Lahrichi, 2024; Mohamad, 2022).

2.6 Market Structure and Competitive Environment

Competition and market concentration affects banks' ability to give loans and deposit deposits, shape margin and take risk. Centered market may provide pricing power to major banks, increase profitability, but can potentially reduce efficiency due to monopoly trend (Chaffai and Coccorese, 2023). Egypt's banking sector studies, bank efficiency and implications for the implications for profitability indicate constant concentration, modified by regulatory efforts to promote competition and inclusion (Elatroush, 2023).

3. Study methodology:

3.1 Study Problem:

The profitability of banks in emerging economies, particularly in Egypt, has been a subject of intense scholarly and policy interest due to the central role of the banking sector in financial intermediation and economic development. Despite the structural reforms implemented by the Central Bank of Egypt over the past two decades, Egyptian banks continue to face challenges related to profitability volatility, which undermines financial stability and long-term growth. While prior studies have identified internal (bank-specific) and external (macroeconomic and industry-specific) factors as key determinants of bank profitability, there remains a dialectical tension in the literature regarding the relative significance and direction of these factors in the Egyptian context. For instance, some scholars argue that capital adequacy and asset quality are the primary drivers of profitability, whereas others emphasize the dominant influence of macroeconomic variables such as inflation and GDP growth. This contradiction reflects a broader theoretical and empirical gap concerning how micro-level bank characteristics interact with macro-level economic conditions to shape profitability outcomes in a transitional economy like Egypt.

The determinants of bank profitability in Egypt are not only rooted in internal efficiency but are also significantly influenced by the volatile macroeconomic environment, regulatory shifts, and competitive pressures

within the banking sector. This dialectic between internal resilience and external vulnerability underscores the need for a comprehensive analysis that reconciles these competing influences. Furthermore, the limited consensus on the stability and direction of these relationships—especially in the aftermath of the 2011 political upheaval and the 2016 & 2023 IMF-backed economic reform program—calls for updated empirical investigation using recent data. Therefore, this study seeks to address the following research question: What are the key bank-specific and macroeconomic factors that determine the profitability of banks in Egypt, and how do they interact in shaping financial performance? By answering this question, the research aims to contribute to both theoretical understanding and policy formulation in the domain of banking sector performance in emerging markets.

3.2 hypotheses

Based on the literature review and the study problem, the following hypotheses can be formulated:

H1: There is a significant impact of each of the economic and regulatory variables and Bank-Specific on return on assets rates of bank.

H2: There is a significant impact of each of the economic and regulatory variables and Bank-Specific on return on equity rates of bank.

3.3 Study Variables

The study variables span macroeconomic, regulatory, institutional, and sustainability-related dimensions, reflecting both internal bank-specific factors and external systemic conditions. Each variable is grounded in theoretical and empirical banking literature and is particularly relevant to the structural and institutional characteristics of Egypt's financial system.

The Economic Growth Rate (EG) serves as a proxy for the overall health of the national economy, measured by the annual percentage change in real Gross Domestic Product (GDP). A growing economy stimulates demand for credit, enhances corporate profitability, and improves the creditworthiness of borrowers, thereby positively affecting banks' asset quality and profitability. In the Egyptian context, where economic fluctuations have historically influenced financial sector stability, sustained GDP growth is a critical enabler of banking sector expansion and performance, as supported by empirical studies such as Pasiouras et al., (2009)., Guidara et al., (2011); Naceur & Kandil (2013); Zheng et al., (2017);

Manish & O'Reilly (2019); Helmy & Wagdi (2019); Ledhem & Mekidiche (2020); Ijaz et al., (2020), Ozili and Ndah (2024), and Ruxho & Beha (2024)

The Interest Rate (IR), typically represented by the Central Bank of Egypt's (CBE) policy rate, directly affects banks' net interest margins—the primary source of income for most Egyptian banks. Variations in interest rates influence both the cost of funds and the yield on lending, thereby shaping profitability. While higher interest rates may increase lending income, they can also dampen credit demand and increase default risks, particularly in an economy with high inflationary pressures. Conversely, low rates may stimulate borrowing but compress margins. The dual impact of interest rate policy on bank performance has been widely documented in studies such as Naceur & Kandil (2013); Rashid & Khalid (2017); Helmy & Wagdi (2019); Yuan et al. (2022) O'Connell (2023)., underscoring its significance in monetary transmission and financial stability.

Dollarization (D), defined as the proportion of financial assets held in foreign currency—primarily U.S. dollars—within the domestic banking system, is a persistent feature of the Egyptian economy due to historical inflation and currency depreciation. High dollarization exposes banks to exchange rate volatility, limits the effectiveness of monetary policy, and increases balance sheet mismatches. As demonstrated by Kutan et al. (2012); Vera-Gilces et al. (2020); and Meireles and Rivera (2025), dollarized economies face greater financial fragility, which can impair bank performance through increased risk exposure and reduced confidence in the domestic currency.

The Required Reserve Ratio (RRR) is a key monetary policy instrument employed by the CBE to regulate liquidity in the banking system. By mandating that banks hold a certain percentage of their deposits as non-interest-bearing reserves, the RRR directly affects the volume of funds available for lending and investment. A higher RRR constrains banks' ability to generate interest income, potentially reducing profitability and efficiency. Gilbert and Peterson (1975) and Helmy and Wagdi (2019) emphasize that frequent adjustments in reserve requirements can create uncertainty and hinder long-term strategic planning in the banking sector.

Capital Adequacy Requirements (CAR), measured as the ratio of a bank's capital to its risk-weighted assets, reflect regulatory efforts to ensure solvency and absorb potential losses. Aligned with Basel III standards, CAR

enhances financial stability by limiting excessive risk-taking. While adequate capital buffers protect banks during economic downturns, overly stringent requirements may limit credit expansion and reduce return on equity. Empirical evidence from Pasioras et al. (2009) and Gopalan (2021) suggests that an optimal level of capital adequacy supports both stability and performance in emerging markets.

Nonperforming Loans (NPL), expressed as the percentage of loans that are in arrears or unlikely to be repaid, serve as a critical indicator of credit risk and asset quality. High NPL ratios increase provisioning costs, erode profitability, and signal weak risk management practices. In Egypt, where non-performing loans have fluctuated with macroeconomic instability and sectoral vulnerabilities, controlling NPLs remains a central challenge for banks and regulators alike. Lu et al. (2005) and Kingu et al. (2018) consistently find a negative relationship between NPL levels and bank performance across diverse financial systems.

Bank Efficiency (BE) captures the operational effectiveness with which banks convert inputs (such as labor, capital, and deposits) into outputs (such as loans and profits). It is typically estimated using frontier analysis methods like Data Envelopment Analysis (DEA) or stochastic frontier models. Higher efficiency indicates better resource utilization and cost management, contributing to improved profitability and competitiveness. In Egypt's increasingly competitive banking environment, efficiency is a key determinant of long-term sustainability, as noted by Girardone et al. (2004) and Arora (2014).

The Loan-to-Deposit Ratio (LDR) reflects the proportion of a bank's deposits that are deployed as loans, serving as a measure of liquidity management and lending intensity. An optimal LDR indicates a balanced approach to credit expansion and liquidity preservation. Excessively high ratios may expose banks to liquidity risk, particularly in a context where deposit withdrawals can be volatile, while low ratios may suggest underutilization of resources. Sufian and Habibullah (2009) highlight the importance of LDR in assessing the intermediation function and financial soundness of banks in emerging economies.

The Equity-to-Assets Ratio (EAR) measures the share of a bank's total assets financed by shareholders' equity, serving as a gauge of financial leverage and resilience. A higher EAR indicates lower reliance on debt

financing and greater capacity to withstand shocks, thereby enhancing investor and depositor confidence. However, excessively high equity levels may reduce return on equity if capital is not efficiently deployed. Empirical work by Sufian and Noor Mohamad (2012) confirms a positive association between EAR and bank performance in developing financial markets.

The relationship between a financial institution's size and its profitability is a complex. Initially, increasing size confers significant advantages through economies of scale, such as the dilution of fixed operational costs over a larger asset base, enhanced opportunities for risk diversification across geographies and product lines, and greater market power to optimize funding costs and loan pricing. However, beyond a certain optimal threshold, these benefits can be counteracted by the emergence of diseconomies of scale, where increased bureaucratic inertia, heightened regulatory compliance burdens (particularly for systemically important financial institutions), and the challenges of managing excessively complex and sprawling operations can erode operational efficiency and, consequently, net interest margins and return on assets. Consequently, while scale is a critical determinant of performance, its impact is contingent upon a bank's ability to manage the operational and strategic complexities that accompany expansion. Empirical work by Delis & Papanikolaou (2009); Sufian (2009); Rizwan et al., (2018); Alber (2014); Phan et al., (2016) indicates the importance of this relationship in explaining the profitability of banks.

The relationship between a bank's age and its profitability is multifaceted, reflecting the interplay of institutional legacy, market positioning, and adaptive capacity. Established, older banks often benefit from significant competitive advantages that bolster profitability, including deep-rooted customer loyalty, extensive branch networks, a recognized brand reputation that reduces customer acquisition costs, and invaluable experiential knowledge of credit risk cycles. This entrenched position can facilitate cheaper funding sources and a more stable deposit base. However, this same legacy can also impose drags on performance in the form of organizational inertia, outmoded technological infrastructure that elevates operational costs, and cultural resistance to innovation, potentially causing them to lag behind more agile fintech competitors and neobanks in adopting efficiency-enhancing technologies. Conversely, while newer banks face the initial profitability challenges of high customer acquisition costs and the need to build trust, they are often unencumbered by legacy systems and can

leverage modern, scalable digital platforms from inception to achieve superior operational efficiency. Ultimately, a bank's age is less a direct determinant of profitability than a proxy for its underlying strategic assets and liabilities; sustained profitability is contingent not on chronological age itself, but on the institution's ability to leverage the strengths of its history while simultaneously innovating to mitigate its inherent constraints. Tariq et al., (2021) indicates the importance of this relationship in explaining the profitability of banks.

The comparative profitability structures of conventional, Islamic, and specialized banks are fundamentally shaped by their distinct operational paradigms, regulatory constraints, and target markets. Conventional banks, operating on an interest-based model, derive their primary income from net interest margins (NIM), which are highly sensitive to central bank policy rates and yield curve dynamics; their profitability is further augmented by fee-based services and trading activities, albeit with greater exposure to speculative risks. In contrast, Islamic banks, governed by Shariah principles prohibiting *riba* (interest) and *gharar* (excessive uncertainty), operate on asset-backed profit-and-loss sharing (PLS) contracts such as *mudarabah* and *musharakah*, and markup-based financing like *murabaha*. This asset-centric model often leads to a different risk-return profile, where profitability is linked to the performance of real economic assets rather than interest rates, potentially offering more stable returns but also introducing unique risks such as asset-liability mismatches in PLS modes and higher operational costs associated with Shariah compliance and complex contract structuring. Specialized banks, including investment banks or development banks, focus on niche segments; their profitability is typically more volatile, heavily dependent on fee income, advisory services, and capital markets performance for the former, and often subordinate to strategic policy objectives for the latter, which may prioritize developmental impact over pure financial return. Consequently, while aggregate profitability metrics may appear similar, their drivers and sustainability differ markedly, with conventional banks exposed to interest rate volatility, Islamic banks to asset quality and operational efficiency challenges, and specialized banks to cyclicality in their narrow market segments. Rashid & Khalid (2017); Rizwan et al., (2018); Khan et al., (2021) indicates the importance of this relationship in explaining the profitability of banks.

The ownership structure of a bank exerts a profound and multifaceted influence on its profitability by shaping its fundamental objectives, governance incentives, and capacity for strategic agility. Publicly listed banks are typically subject to intense capital market pressure to maximize shareholder value and deliver consistent quarterly returns, which can foster a strong profit orientation and operational efficiency; however, this may also incentivize excessive short-term risk-taking that can jeopardize long-term stability. In contrast, state-owned banks often operate with a dual mandate that subordinates profitability to broader socio-political goals, such as fostering industrial development or promoting financial inclusion, which can lead to allocative inefficiencies, higher non-performing loans due to directed lending, and consequently, depressed returns on equity. Therefore, a bank's ownership is a critical determinant of its financial performance, as it directly defines the principal-agent relationships and the core priorities—be they profit, social welfare, or member service—that ultimately govern strategic decision-making and resource allocation. Griffith et al., (2002); Sathye (2005); Arora (2014); Rizwan et al., (2018) indicates the importance of this relationship in explaining the profitability of banks.

Finally, Environmental, Social, and Governance (ESG) Activities—encompassing Environmental Activity (EA), Social Activity (SA), and Governance Mechanisms (GM)—represent a growing area of interest in banking research. These non-financial factors reflect a bank’s commitment to sustainable development, ethical conduct, transparency, and stakeholder engagement. In Egypt, where financial inclusion, climate resilience, and corporate governance reforms are gaining policy traction, ESG practices are increasingly linked to reputational capital, regulatory compliance, and long-term value creation. As highlighted by Griffith et al. (2002) and Azmi et al. (2021), strong ESG performance correlates with improved financial outcomes, reduced operational risks, and enhanced access to international capital markets.

Collectively, these variables provide a multidimensional framework for analyzing the determinants of bank performance in Egypt, integrating macroeconomic dynamics, regulatory frameworks, operational efficiency, and emerging sustainability imperatives. Their inclusion enables a robust assessment of both traditional and contemporary drivers of financial performance in a developing economy undergoing structural transformation.

3.4 Study Sample

The study sampled 12 banks, all of which are listed on Egyptian Exchange (EGX). The respective banks are shown in Table (1).

Table 1 Study Sample		
Bank	**code**	Listing
Société Arabe Internationale De Banque (SAIB)	SAIB.CA	29-11-1980
Suez Canal Bank	CANA.CA	15-09-1982
Housing & Development Bank	HDBK.CA	13-09-1983
Egyptian Gulf Bank	EGBE.CA	17-11-1983
Al Baraka Bank Egypt	SAUD.CA	25-12-1984
National Bank of Kuwait- Egypt- NBK	NBKE.CA	12-09-1994
Commercial International Bank (Egypt)	COMI.CA	02-02-1995
Faisal Islamic Bank of Egypt	FAIT.CA	07-06-1995
Export Development Bank of Egypt (EDBE)	EXPA.CA	14-12-1995
Qatar National Bank Alahly	QNBA.CA	03-07-1996
Credit Agricole Egypt	CIEB.CA	03-07-1996
Abu Dhabi Islamic Bank- Egypt	**ADIB.CA**	19-06-1996

3.5 Stationary of Data

The perception of stable (continuous variance) is present in several time chain methods. One of the defined characteristics of a steady process is that "mean", "variance", and "autocorrelation values" do not vary over time; The study stabilized the data to ensure that the meanings and variance were irreversible according to a unit root test, the stability of the timing of the original independent and dependent indicators at the level zero was evaluated according to the constant level. It was done through "enhanced Dickey-Fuller (ADF)", "Philips-Peron (PP)", ""Im, Pesaran and Shin W-stat (IPSW)", "Levin, and Lin and Lin and Chu t (LLC)" tests at a significance level of less than 0.05. In addition to "Tau-Statistic", the "Z-Statistic" criteria were at the importance of less than 0.05.

3.5 First hypothesis test

Under First hypothesis test; the study Examining the Impact of Economic Variables; Banking Regulations Variables and Bank-Specific on

Returns on Assets of Banks; Table 2 shows the outputs of the first hypothesis test.

Table 2: Outputs of the first hypothesis test					
	Coefficie	**Std.**	**t-ratio**	**p-value**	
Const.	−10.1583	2.43967	−4.164	<0.0001	*
EG	6.07297	0.864817	7.022	<0.0001	*
IR	−0.00180	0.022123	−0.08152	0.9351	
RRR	5.35311	1.24656	4.294	<0.0001	*
CAR	0.078996	1.43068	0.05522	0.9560	
D	−6.91542	1.54563	−4.474	<0.0001	*
NPL	-1.59874	0.273646	5.842	<0.0001	*
BE	−0.01154	0.008443	−1.367	0.1731	
LDR	3.21793	1.26360	2.547	0.0116	*
EAR	−1.13880	1.31331	−0.8671	0.3869	
EA	−0.03650	0.007747	−4.712	<0.0001	*
SE	−7.24114	1.21093	−5.980	<0.0001	*
MB	−1.01409	0.000436	−0.00232	0.9981	
SIZE	−0.00043	0.000515	−0.8388	0.4025	
STYLE	−0.01126	0.018895	−0.5960	0.5518	
OWN	−0.09340	0.022503	−4.151	<0.0001	*
Mean dependent	1.643535	S.D. dependent var		0.443959	
Sum squared resid	0.611916	S.E. of regression		0.053725	
LSDV R-squared	0.986955	Within R-squared		0.986841	
LSDV F(26, 212)	616.9217	P-value(F)		1.3e-184	
Log-likelihood	374.0048	Akaike criterion		−694.0095	
Schwarz criterion	−600.145	Hannan-Quinn		−656.1847	
Rho	−0.10849	Durbin-Watson		2.159016	
Fixed-effects, using 239 observations Included 12 cross-sectional units					

Source: GRETL

Table 2 shows that the factors that have a significant impact on the rate of return on bank assets are the economic growth rate, required reserve ratios, dollarization, non-performing loan ratio, loan-to-deposit ratios, environmental activities, bank age and finally the bank type (conventional/Islamic/specialized) on the bank's profitability, with an explanation power rate of 98.69%. The rest of the explanation rate is due to variables that were not included in the model under test**.** Therefore, study can reject the null hypothesis and accept the alternative hypothesis that:

H1: There is a significant impact of each of the economic and regulatory variables and Bank-Specific on return on assets rates of bank.

3.6 Second hypothesis test

Under First hypothesis test; the study Examining the Impact of Economic Variables; Banking Regulations Variables and Bank-Specific on Returns on equity of Banks; Table 3 shows the outputs of the first hypothesis test.

Table 3: Outputs of the second hypothesis test

	Coefficien	Std.	t-ratio	p-value	
Const.	203.541	94.0223	2.165	0.0315	**
EG	52.5407	33.3292	1.576	0.1164	
IR	−2.48228	0.852604	−2.911	0.0040	**
RRR	−12.3388	48.0411	−0.2568	0.7976	
CAR	−74.5238	55.1370	−1.352	0.1779	
D	125.803	59.5671	2.112	0.0359	**
NPL	−9.01985	10.5460	−0.8553	0.3934	
BE	0.314345	0.325410	0.9660	0.3351	
LDR	−65.5778	48.6977	−1.347	0.1795	
EAR	−73.2924	50.6137	−1.448	0.1491	
EA	−1.75589	0.298589	−5.881	<0.0001	**
SE	62.2737	46.6681	1.334	0.1835	
AGE	−0.061683	0.016819	−3.667	0.0003	**
SIZE	−0.001636	0.019863	−0.08240	0.9344	
STYLE	1.93159	0.728227	2.652	0.0086	**
OWN	−0.470861	0.867260	−0.5429	0.5877	
Mean dependent	13.88772	S.D. dependent	4.643905		
Sum squared resid	908.8507	S.E. of	2.070515		
LSDV R-squared	0.822928	Within R-	0.822077		
LSDV F(26, 212)	37.89445	P-value(F)	1.70e-65		
Log-likelihood	−498.7445	Akaike criterion	1051.489		
Schwarz criterion	1145.354	Hannan-Quinn	1089.314		
Rho	−0.055561	Durbin-Watson	1.245627		
Fixed-effects, using 239 observations Included 12 cross-sectional units					

Source: GRETL

Table No. 3 shows that the factors that have a significant impact on the bank's profitability are the interest rate, the dollarization, environmental activities, the age of the bank, and the type of bank activity (conventional/Islamic/specialized), with an average explanation power of 82.29%. The rest of the percentage is due to factors that were not included in the model under analysis. Therefore, study can reject the null hypothesis and accept the alternative hypothesis that:

H2: There is a significant impact of each of the economic and regulatory variables and Bank-Specific on return on equity rates of bank.

3.7 Discussion

The empirical conclusions of this study provide valuable insight into bank performance determinants in the Egyptian banking sector, characterized by economic instability, regulatory reforms and digital changes. Using a fixed-effect panel regression on 12 listed banks in a period of 2015-2024, the results reveal the fine relationship between economic, regulatory, operations and bank-specific factors and two performance metrics: return to property (ROA) and equity (ROE). These results align and expand with pre-literature on bank performance in emerging economies, highlighting reference-specific dynamics in Egypt.

For ROA, which measures profitability, Economic Growth Rate (EG) emerged as an important positive determinant, supporting the perception that macroeconomic expansion credits demand and borrower repayment capacity (Sufian & Habibullah, 2009; Wagdi & Salman, 2022). This discovery underlines the procedural nature of banking in emerging markets, where GDP growth bolts reduce asset usage and default risks. In contrast, the non-performing loan (NPL) has a strong negative impact, which conforms to studies emphasizing the quality of the asset as a significant risk factor, which eradicates the earnings through the provision (Ghosh, 2015; Naili & Lahrichi, 2022; El-Ansary & Megahed, 2024).

The positive effects of the loan-to-deposit ratio (LDR) suggest that the prudent credit expansion, when balanced with deposits, excessive liquidity increases interest income without stress (Sufian & Noor Mohamad, 2012; Wagdi & Salman, 2022). Regulatory factors, such as the required Reserve Ratio (RRR), also affected the ROA positively, indicating that liquidity gave the Basel III-inspired reforms (Naceur & Kandil, 2009; Helmy & Wagdi, 2019) to investor stability and investor confidence in line. However, dollarization (D) and Environment/Social Activities (EA and SE) negatively affected the ROA, potentially currency mismatch risks and resource-growth markets in emerging markets short-term cost of ESG integration (Kutan et al., 2012; Azmi et al., 2021). The ownership structure (itself) showed a negative engagement, aligning with evidence that high-free float can dilute

control and introduce agency issues (Griffith et al., 2002; Rizwan et al., 2018).

In contrast, the determinants of the Roe, who capture shareholders. The negative effect of interest rates (IR) highlights how to compress the net interest margin by monetary tightening, a common challenge in inflation-prone emerging economies (BIS, 2020; Shokr, 2020). The dollarization positively affected ROE, possibly by providing a rescue against local currency depreciation and attracting stable foreign deposits (Vera-Gilces et al., 2020). Environmental activities (EA) re -influenced the performance negatively, suggesting that the ESG initiative, while morally mandatory, can apply initial costs that receive benefits for equity holders in the short term (Orazalin & Mahmood, 2019; Bezawada, 2020). The bank had a negative effect of maturity (age), which means that older institutions face bureaucracy inefficiencies or inheritance risks, resulting in conclusions on low returns from the scale without innovation (Bahyaoui, 2017; Tariq et al., 2021). In particular, bank style (conventional/Islamic/specialized) positively correlated with ROE, indicating that special or Islamic banks can improve traditional people due to top strategies and Sharia- compliant Structures (Ben Zeineb & Mensi, 2018; Elatroush, 2023).

These results contribute to literature by integrating ESG and digital factors - although the latter was not directly important in regression - emerging determinants in terms of Egypt (Azzabi & Lahrichi, 2024; Potapova et al., 2022). High explanatory power (e.g., 98.7% for ROA) validation of the strength of the model, but the discrepancies in the metrics highlight that profitability (ROE) reacts differently for shocks, Grigorian and Manole (2006) and O'Connell (2023). Practically, conclusions advocate for raising flexibility for prudent debt management, macroeconomic stability and balanced ESG adoption. Policy makers should prioritize anti-dollarization measures and flexible reserve policies, while bank managers focus on efficiency and innovation to reduce NPL risks.

4. Conclusion and Recommendations

4.1 Conclusions

This study provides a robust, empirically grounded analysis of the determinants of bank profitability in Egypt, a pivotal emerging market in the MENA region. By employing a fixed-effects panel regression on data from 12 listed Egyptian banks over the 2015-2024 period, the study offers nuanced

insights into how bank-specific, macroeconomic, regulatory, and emerging (ESG) factors differentially impact Return on Assets (ROA) and Return on Equity (ROE). The findings are not merely statistical outcomes but reflect deep-seated theoretical principles in finance, including agency theory, risk-return trade-offs, the efficiency frontier, and the transmission mechanisms of monetary policy. The analysis confirms that bank performance in emerging markets like Egypt is not governed by a monolithic set of factors but is the result of a complex, dialectical interplay between internal resilience and external vulnerability.

4.1.1. The Primacy of Macroeconomic Stability for Asset Utilization (ROA): The strong, positive, and statistically significant impact of the Economic Growth Rate (EG) on ROA ($p<0.0001$) underscores the fundamental finance theory that banks are procyclical institutions. In a growing economy, as theorized by Levine (1997) and empirically validated by Sufian & Habibullah (2009), credit demand rises, and borrower solvency improves. This reduces credit risk (lowering provisions) and allows banks to deploy their asset base (loans, securities) more effectively, thereby maximizing returns on total assets. This finding validates the "real economy transmission channel" to bank profitability.

4.1.2 Asset Quality as the Core Risk Management Imperative: The highly significant negative coefficient for Non-Performing Loans (NPL) on ROA ($p<0.0001$) is a cornerstone conclusion, aligning perfectly with credit risk theory. High NPLs represent a direct erosion of capital through provisioning and an indirect cost through the opportunity cost of non-productive assets. This finding reinforces the theoretical framework established by Berger & Bouwman (2013) and Ghosh (2015), which posits that prudent credit risk management is non-negotiable for sustainable profitability, especially in volatile emerging markets.

4.1.3 The Duality of Liquidity and Regulation: The positive impact of the Loan-to-Deposit Ratio (LDR) and Required Reserve Ratio (RRR) on ROA presents an interesting theoretical nuance. A higher LDR, when managed prudently, reflects efficient intermediation—the core function of banking—whereby banks transform short-term deposits into higher-yielding long-term loans, maximizing net interest income (Sufian & Noor Mohamad, 2012). The positive effect of RRR, while seemingly counterintuitive (as it ties up non-interest-bearing assets), can be interpreted through the lens of financial stability theory. In the Egyptian context, a higher RRR may signal

a more stable, less volatile banking system to investors and depositors, reducing the bank's cost of funds and systemic risk premium, which ultimately supports asset profitability. This aligns with the Basel framework's objective of using capital and liquidity buffers to enhance systemic resilience.

4.1.4 The Shareholder Perspective: Interest Rates, Dollarization, and Strategic Positioning (ROE): The determinants of ROE, which measures return to shareholders, tell a different story, reflecting the distinct theoretical underpinnings of equity valuation. The negative impact of Interest Rates (IR) on ROE (p=0.0040) highlights the "net interest margin compression" effect. In an environment of monetary tightening (high policy rates), while lending yields may rise, the cost of funding (especially for banks reliant on short-term wholesale markets) can rise faster, squeezing margins and directly impacting shareholder returns, as noted by the BIS (2020).

The positive effect of Dollarization (D) on ROE (p=0.0359) is a critical, context-specific finding. It suggests that in an economy with a history of currency depreciation, holding dollar-denominated assets or attracting dollar deposits acts as a hedge for shareholders, protecting the real value of their equity investment. This finding resonates with the theory of currency risk management in international finance (Vera-Gilces et al., 2020).

Most significantly, the positive and significant impact of Bank Style (STYLE) on ROE (p=0.0086) points to the power of strategic differentiation. Islamic and specialized banks, by operating under unique business models (e.g., profit-and-loss sharing, niche market focus), can carve out competitive advantages that translate into superior returns for equity holders, even if their overall asset efficiency (ROA) is not statistically different. This supports the resource-based view (RBV) of the firm, where unique capabilities and market positioning drive superior financial performance.

4.1.5 The Cost of Modernity: ESG and Organizational Inertia: The consistently negative and significant impact of Environmental Activities (EA) on both ROA and ROE is a crucial finding. While ESG is theoretically linked to long-term value creation and risk mitigation (Azmi et al., 2021), the empirical results suggest that in the Egyptian context, these activities currently represent a net cost. This could be due to the initial investment required for compliance, reporting, and implementing sustainable practices, which outweigh the short-term benefits of reputational enhancement or risk

reduction. This finding highlights the tension between normative stakeholder theory and the positive agency theory that prioritizes immediate shareholder returns.

Similarly, the negative impact of bank Age (AGE) on ROE (p=0.0003) supports the theory of organizational inertia (Tariq et al., 2021). Older banks, despite their brand and customer loyalty, may suffer from bureaucratic inefficiencies, legacy IT systems, and a cultural resistance to innovation, making them less agile and less profitable for shareholders compared to newer, digitally-native competitors.

4.2 Recommendations

Based on above theoretical and empirical conclusions, the following recommendations are proposed for different stakeholders:

4.2.1 For Bank Managers:

4.2.1.1 Prioritize Credit Risk Management: Implement advanced, data-driven credit scoring and monitoring systems to proactively manage and reduce NPLs. This is the single most impactful lever for improving ROA.

4.2.1.2 Optimize Balance Sheet Management: Focus on achieving an optimal LDR that maximizes interest income without exposing the bank to undue liquidity risk. This requires sophisticated asset-liability management (ALM) frameworks.

4.2.1.3 Embrace Strategic Differentiation: For conventional banks, explore niche markets or service innovations. For Islamic banks, leverage the unique value proposition of Sharia-compliant finance to attract a loyal customer base and command premium pricing.

4.2.1.4 Invest in Digital Transformation Prudently: While not statistically significant in this model, digitalization is a key trend for operational efficiency (reducing BE) and customer acquisition. Invest in scalable, secure digital platforms to combat organizational inertia, particularly for older institutions.

4.2.1.5 Develop a Long-Term ESG Strategy: Recognize that EA currently acts as a cost center. Develop a phased ESG strategy that focuses on initiatives with clear, measurable ROI (e.g., energy efficiency to reduce operational costs) to transition EA from a cost to a value driver over the medium to long term.

4.2.2 For Policymakers and Regulators (Central Bank of Egypt):

4.2.2.1 Anchor Macroeconomic Stability: Continue policies that promote sustainable, non-inflationary GDP growth. A stable macroeconomic environment is the bedrock of a healthy banking sector, as confirmed by the EG-ROA link.

4.2.2.2 Adopt a Risk-Based, Flexible Regulatory Approach: The positive RRR-ROA link suggests stability is valued. However, regulators should avoid overly stringent, one-size-fits-all capital and reserve requirements that stifle credit growth. A risk-based approach, as per Basel principles, allows well-managed banks to operate more efficiently.

4.2.2.3 Promote Competition and Innovation: Encourage a competitive banking landscape to drive efficiency and innovation, which can help mitigate the negative effects of age and size-related diseconomies. Support the development of fintech to enhance financial inclusion and operational efficiency across the sector.

finally, the Profitability of Egyptian banks is a multifaceted phenomenon. Success requires a delicate balance: maintaining stringent control over credit risk while pursuing growth, navigating the complexities of a volatile macroeconomic and regulatory environment, and strategically investing in differentiation and modernization (including ESG) for long-term sustainability. The theoretical frameworks of finance provide the lens through which these empirical findings can be understood and translated into actionable strategies for all stakeholders.

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