Financial performance of Islamic and conventional banks in MENA region: a GLS approach

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Abstract

Purpose – The purpose of this study is to assess and contrast the impact of various factors, including both bank-specific and macroeconomic factors, on the financial performance of Islamic and conventional banks (I&CB) in countries with a dual banking system.

Design/methodology/approach – A general least square model is applied to a large data set of 103 I&CB operating in the Middle East and North Africa (MENA) region, comprising unbalanced annual panel data spanning the period from 2015 to 2020. The financial performance index (FPI) derived from capital adequacy, asset quality, management efficiency, earnings, and liquidity (CAMEL) ratios is used as the dependent variable.

Findings – Key factors, such as overhead expenses, gross domestic product (GDP) and retained earnings, exert a substantial influence on the financial performance of both I&CB. Moreover, the findings suggest that certain parameters, including deposits, inflation and cellular banking usage, significantly impact on the financial performance of conventional banks, while bank size specifically affects the financial performance of Islamic banks.

Research limitations/implications – While this study provides valuable insights, it is essential to acknowledge its limitations. The research focuses on a specific region (MENA) and may not be universally applicable to other geographical areas or banking systems. The study's findings are based on historical data and might not fully reflect current or future market conditions. Additionally, the choice of variables and methodology may introduce bias or limitations, as with any empirical study. The theoretical implications of the research paper lie in the distinct ethical principles that constitute the foundation of Islamic finance. The ethical opposition to Riba is poised to have extensive implications, influencing market stability, commercial and economic impact and contributing to responsible banking practices within the Islamic banking sector. The study suggests that adherence to these sacred principles not only aligns with ethical considerations but also fosters social responsibility within Islamic banking institutions. This holds significance for broader societal and economic impacts, as responsible banking practices contribute to sustainable and equitable economic development.

Practical implications – The study underscores the significance of efficient overhead cost management for conventional banks, particularly in the context of a rapidly evolving digital banking environment. The call

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for adaptation and innovation in operational strategies aligns with the broader principles of efficiency and effectiveness emphasized in Islamic finance.

Social implications – In essence, the theoretical and practical implications of the study surpass the narrow focus on financial performance, resonating with the broader societal and economic landscape within the Islamic banking sector. The integration of ethical principles not only reinforces the unique identity of Islamic finance but also positions it as a model for responsible and sustainable banking practices in the MENA region and beyond.

Originality/value – CAMEL ratios are used to build an FPI to evaluate bank performance, providing a more precise and comprehensive assessment compared to traditional return ratios like return on assets or return on equity. Second, the authors conduct a thorough analysis covering factors across bank-specific, financial and macroeconomic dimensions. Thus, the study stands out by not only examining bank-specific factors but also by considering external factors such as GDP, interest rates and the development of the financial sector. The focus on the MENA region allows us to offer generalizable findings, highlighting distinctions between I&CB and considering a period with boom years (2015–2019) and a recession year (2020).

Keywords Financial performance, Islamic bank, Conventional bank, CAMEL ratios

Paper type Research paper

1. Introduction

Over the past two decades, the global banking sector has encountered significant disruptions and crises (Juergensen *et al.*, 2020). These transformations have not only affected banking operations but have also reshaped the competitive landscape, impacting consumers and business firms (Al Zaidanin, 2020; Huson *et al.*, 2024). Despite financial crises and their associated challenges, the banking sector's role in providing essential financial services to all stakeholders has remained pivotal. In this context, the empirical determinants of bank performance have garnered the attention of academic researchers, bank managers, supervisors and financial market regulators (Fernandes *et al.*, 2018). As Bawaneh and Dahiyat (2019) assert, a profitable and robust banking sector is more resilient against adverse shocks and plays a vital role in stabilizing and fortifying the financial system. Analyzing a bank's performance is particularly beneficial in emerging economies, where the banking environment differs significantly from that of developed nations.

From a practical perspective, financial performance indicators are essential for investors and decision-makers when shaping their investment strategies (Boto-García *et al.*, 2021; Abu Huson *et al.*, 2024). Hence, there is a pressing need to study these factors to enhance banks' profitability (Jaara *et al.*, 2021; Al-Kayed, 2017). Given the myriad factors influencing the banking industry, comprehensive assessments of financial health have become indispensable. For central and local authorities, monitoring banks' activities is a crucial task for evaluating the economic well-being of a country (Al Zaidanin, 2020). Furthermore, the distinctions between two competing banking models, conventional and Islamic banking, have come under scrutiny, especially in the aftermath of the 2007–2008 financial crises that challenged the resilience of conventional banking (Ahsan and Qureshi, 2022). Although traditional banking has been studied for decades, there has been a significant growth in research on Islamic banking and finance in recent times (Kocenda and Iwasaki, 2022).

The banking sector currently plays a vital role in the social development agendas of the Middle East and North African (MENA) nations, expanding within both the regional financial system and the nation-states themselves (El Khoury *et al.*, 2021). The MENA region comprises 20 nations with a total population of 357.3 million people and has experienced substantial economic growth, accounting for over 5% of global gross domestic product (GDP) (Caporale *et al.*, 2018). This region includes both oil-rich and stable nations, such as Saudi Arabia, Kuwait, Qatar and the United Arab Emirates, as well as areas with

challenging conditions, such as Iraq, Syria, Libya and Yemen (Haque and Brown, 2017). Despite its significance, the MENA banking industry has received relatively little attention compared to developed countries. To address this, we have selected nine stable countries from the MENA region, including Jordan, Kuwait, Qatar, the Kingdom of Saudi Arabia, Bahrain, United Arab Emirates, Morocco, Egypt and Tunisia. These countries operate with dual banking systems that include both conventional (CB) and Islamic banks (IB), making it essential to analyze the diverse features of these institutions. This dual banking system provides customers with a wide range of services and products catering to different financial needs and preferences, allowing them to choose between conventional banking, based on interest-based lending and borrowing and Islamic banking, based on profit and loss sharing principles (Anouze *et al.*, 2019).

Islamic finance is a rapidly growing global financial system of increasing importance (Kassim, 2016; Qudah *et al.*, 2024). The rapid development of Islamic finance has created complexity for regulators, emphasizing the need for standardization and harmonized regulation (Grassa, 2015). Namely, Islamic banking, a key component of Islamic finance, presents regulatory challenges due to the different business models (Hassan *et al.*, 2023).

Numerous empirical studies have shown that various internal factors (e.g. overheads, liquidity, leverage ratios, earnings, credit risk, concentration, solvency risk, operating expenses, deposits and bank size) and macroeconomic factors (e.g. GDP, inflation rate, legal interest rate and exchange rate) significantly influence the financial performance of both CB and IB (Rashid and Jabeen, 2016; Matar and Eneizan, 2018; Muhindi and Ngaba, 2018; Quoc Trung, 2021).

This study aims to assess and contrast the impact of various factors on the performance of both Islamic and conventional banks (I&CB) in the MENA region. Specifically, we intend to create a financial performance index (FPI) based on CAMEL parameters and explore how bank-specific, financial and macroeconomic factors affect this index for both types of banks. The period of analysis includes six years, from 2015 to 2020, in which we can find boom years (2015–2019) with a constant GDP variation in the MENA region of 2.1% and a recession year (2020) with a variation of −3.1%.

Our research makes several valuable contributions to the existing literature. First, we use CAMEL ratios to evaluate bank performance, providing a more precise and comprehensive assessment compared to traditional return ratios like return on assets (ROA) or return on equity (ROE). Second, we conduct a thorough analysis covering factors across bank-specific, financial and macroeconomic dimensions. Thus, our study stands out by not only examining bank-specific factors but also by considering external factors such as GDP, interest rates and the development of the financial sector. Third, our focus on the MENA region allows us to offer generalizable findings, highlighting distinctions between I&CB and considering a period with boom years (2015–2019) and a recession year (2020).

The remainder of the study is structured as follows: Section 2 presents the literature review, Section 3 describes the methodology and data, Section 4 reports the empirical results and Section 5 concludes the study and addresses the study's limitations.

2. Literature review

2.1 Islamic principles

Islamic finance is rooted in six fundamental principles of Islamic law (Shariah). These principles encompass the prohibition of interest (Riba), the obligation to abstain from engaging in criminal or illicit activities and the avoidance of forbidden practices. Moreover, unlike conventional banks, IBs have their operations fully backed by tangible assets. This distinction between the two types of banks holds significant importance, as IB

predominantly conduct their activities based on equity-based instruments, emphasizing profit and loss sharing contracts.

In theory, there are fundamental distinctions between the traditional and Islamic banking models. Nevertheless, both models share a common characteristic as profit-oriented institutions (Zarrouk *et al.*, 2016). Despite the disparities in their core principles, the two banking models offer analogous practical banking products. The primary disparity between them lies in the way they generate income, with interest serving as the primary source of revenue for conventional banks (Chen *et al.*, 2018). Conventional banks rely heavily on interest rate differentials between lending and borrowing. In contrast, interest is strictly prohibited in IB in accordance with Islamic law, as the Islamic Shariah explicitly forbids usury, as stated in the *Holy Qur'an* (Daly and Frikha, 2015; Abasimel, 2023).

I&CB both share the common goal of ensuring an efficient payment mechanism within the economy (Salman and Nawaz, 2018). They also seek to attain profits through project financing. Conventional banks rely on lucrative financing projects in addition to interest fees, as they receive interest whether the project succeeds or faces losses. Conversely, IB operates based on profit and loss sharing principles (Hoepner *et al.*, 2015). Therefore, IB aims to play a meaningful role through their ethical, social and religious dimensions (Abou-Youssef *et al.*, 2015). Islamic finance is distinguished by its connection to tangible assets, aligning it with the real economy (Daly and Frikha, 2015). Furthermore, it adheres to the prohibition of financing activities deemed illicit (*haram*) by the Islamic Shariah. Such activities encompass the consumption of alcohol, pork and participation in gambling. Islamic finance also eschews dealing with contracts that are ambiguous and contain hidden elements. Encouraging the payment of zakat, a form of almsgiving, is a crucial and vital aspect of Islamic finance. It is through this practice that social justice is upheld and achieved, reflecting one of the pillars of Islam.

2.2 Comparison between Islamic and conventional banks performance

In the realm of banking research, numerous empirical investigations have diligently endeavored to assess and compare the performance of I&CB, transcending geographical boundaries and spanning various temporal frames, using a rich tapestry of statistical techniques. An exemplary demonstration of this analytical rigor can be gleaned from the comprehensive meta-analysis conducted by Wahab and Roslan (2021). The overarching conclusion derived from their comprehensive analysis suggests that, when viewed through a global lens, there is no statistically significant discrepancy in performance between I&CB. Nevertheless, in specific contexts, IBs have exhibited a proclivity for superior performance when compared to their conventional counterparts (Miah and Sharmeen, 2015).

In the domain of performance assessment, two critical metrics, ROA and ROE, have garnered widespread adoption in assessing the operational efficacy of both I&CB. Eminent studies conducted by Choong *et al.* (2012), Daly and Frikha (2015) and El-Chaarani *et al.* (2023) underscore the pervasiveness of these performance indicators. It is imperative to illuminate the seminal study conducted by Choong *et al.* (2012), which delved into the intricate tapestry of the Malaysian banking sector. The study's findings, intriguingly, unveiled that factors such as liquidity, diversification (concentration) and even credit risk did not exert statistically significant direct impacts on ROA and ROE. This revelation, challenging conventional wisdom, underscores the multifaceted nature of bank performance dynamics.

Notwithstanding, Rashid and Jabeen (2016) introduced a novel perspective by using the FPI as an encompassing yardstick for evaluating banking performance. A cluster of studies has adroitly embraced the CAMELS framework as their lodestar for evaluating and

comparing the performance of I&CB. These studies have meticulously scrutinized a gamut of criteria encompassing capital adequacy, asset quality, management efficiency, earnings, liquidity and sensitivity to market risk. Keffala (2018) embarked on this path, wielding the CAMELS framework to illuminate the pivotal role of financial options in enhancing the performance of IB. Another seminal expedition into this realm was undertaken by Ali *et al.* (2021) within Pakistan's banking sector, to compare the financial and administrative performance of I&CB. Their findings underscore that both typologies of banks have charted a trajectory of performance improvement within Pakistan's economic milieu. Notably, IBs have excelled in facets such as asset quality, management adequacy and risk sensitivity, while their conventional counterparts have exhibited robust performance in the domains of capital adequacy and liquidity.

Regarding the independent variables, a substantial corpus of the investigations has leaned on bank-specific and financial ratios as analytical instruments. Eminent contributors to this continuum of research include Akala (2018), Muhindi and Ngaba (2018) and El-Chaarani *et al.* (2022).

During times of economic turmoil, several key dynamics come into play, contributing to the decline in banking performance. One of the primary factors is the surge in nonperforming loans as individuals and businesses struggle to meet their financial obligations (Nduati and Wepukhulu, 2020; Albalawee *et al.*, 2024). This uptick in defaults places immense pressure on banks' balance sheets, eroding profitability and capital adequacy (Shahin and El-Achkar, 2016). Furthermore, the tightening of credit markets during economic crises reduces the availability of funds for lending, constraining one of the core revenue streams for banks. Simultaneously, declining asset values, particularly in the real estate sector, can lead to significant write-downs and impairments, further denting banks' financial health (Casey and O'Toole, 2014; Al-Qudah *et al.*, 2022).

Moreover, El-Chaarani *et al.* (2022) embarked on a mission to unveil the critical success factors underlying both I&CB, particularly in the context of the COVID-19 pandemic. Notably, their findings revealed that CB demonstrated a superior financial performance during the crisis and adeptly navigated the complexities of financial risk management. This is further supported by the study conducted by Junjunan *et al.* (2022), which indicated significant differences in financial performance ratios between I&CB during the COVID-19 pandemic. These differences encompassed metrics such as the capital adequacy ratio, nonperforming loans/nonperforming financing, ROA, ROE, operating expenses to operating income and loan to deposit ratio/financing to deposit ratio.

Buallay *et al.* (2021) investigated in Gulf Cooperation Council (GCC) banks the relationship between financial, operational and market performance in I&CB, using the integrated report index (IRI) as an independent variable and regressing it separately against three performance indicators: ROA, ROE and Tobin's Q. The results showed that IRI had a positive impact on market performance in CB but negatively affected operational and financial performance. In IB, IRI negatively influenced market performance, with no significant impact on financial or operational performance.

A subset of scholarly endeavors embarked on the complex terrain of macroeconomic factors, seeking to disentangle their intricate influence on bank performance. These studies offer a panoramic vista of the industry dynamics, fusing micro level bank-specific indicators with macro level economic variables. Bilal *et al.* (2016) used ROA and ROE as the beacons for this exploration, revealing profound insights into the relationships between these factors. Zeitun (2012) juxtaposed bank-specific variables with macroeconomic indicators, unraveling the complex relationship between these elements and the performance of I&CB within the GCC region. This comprehensive inquiry spanning the years 2002 to 2009 illuminated the

significant impact of GDP and inflation on banking performance. Additionally, the study unearthed the profound influence of the bank's size and the cost-to-income ratio on the performance of both I&CB. Rashid and Jabeen (2016), within the context of Pakistan, contributed to this discourse by meticulously scrutinizing the bank-specific and macroeconomic determinants of financial and economic performance. In this vein, operating efficiency, overheads, reserves and deposit concentration were among the pivotal factors under scrutiny by Joseph and Adelegan (2023). The discerning findings of this research underscored the centrality of operating efficiency and the need for prudent control of overheads to enhance the bank's performance. Serwadda (2018) analyzed the influence of overhead costs on financial performance, showing an adverse effect on the banks' performance.

To provide a holistic view of the diverse findings and methodological approaches adopted in prior research, Table 1 serves as a compendium of studies dedicated to the comparative analysis of bank performance determinants within these two distinctive banking ecosystems. In our pursuit of a comprehensive analysis, it was essential to select studies that not only closely align with the core focus of our research but also reflect recent developments in the field. We meticulously curated our literature review by prioritizing studies conducted within the past few years in the MENA region, as well as in countries with a dual system, such as Malaysia, Indonesia and Pakistan. The studies focus on the comparison between I&CB, examining variables that closely resemble those investigated in our paper, with a predominant focus on assessing the financial performance of banks. The decision to incorporate these specific studies over others was grounded in the need for relevance, timeliness and direct alignment with our research objectives, thereby enhancing the rigor and applicability of our findings to the banking sector in the MENA region.

3. Methodology

This section provides a comprehensive discussion of our methodology, data sources, sample selection and a detailed description of the variables used. To begin, we adopt the performance index developed by Teker *et al.* (2011) as the foundational model for calculating the FPI for each bank within our sample throughout the study period. The FPI is constructed based on the parameters of the CAMEL framework. Subsequently, this study conducts an empirical analysis by applying generalized least squares (GLS) to identify the factors influencing bank performance. In this analysis, the FPI serves as the dependent variable, while various bank-specific variables and macroeconomic indicators act as independent variables.

In addition to GLS, a panel data model with fixed and random effects has been applied to give robustness to the results obtained with the GLS.

3.1 Data and sample

Our analysis focuses on the financial data of 118 I&CB operating across nine countries in the MENA region during the years 2015 to 2020, the past year of data availability. From 2015 to 2019 the constant variation of GDP in the MENA region was 2.1% showing a boom period while 2020 was a recession year with a variation of −3.1%. Thus, this timeframe allows the study to capture financial performance trends and dynamics in I&CB that were relevant and contemporary for researchers and policymakers. To ensure the integrity of our empirical analysis results, we deliberately excluded banks operating in MENA nations that were grappling with financial crises and instabilities arising from their political and economic situations. Specifically, countries such as Yemen, Djibouti, Iraq, Algeria, Palestine, Libya, Iran, Lebanon and Syria were excluded from our sample selection. In addition, banks with

Table 1.
Literature overview

Authors/ years	Dependent variables	Independent variables	Methodology	Main conclusions	Analysis period	Country/region
Choong *et al.* (2012)	ROA, ROE	Liquidity, credit risk, level of capital, concentration level and size of the bank	Panel data multiple regression models	Higher credit risk will result in lower earnings and lower ROA and ROE ratios. Liquidity and concentration are relatively insignificant. Level of capital and economic conditions do not influence I&CB performance	2006–2009	Malaysia
Zeitun (2012)	ROA ROE	Bank age, equity, size, reserve/loan ratio, cost-income, foreign ownership, financial development, GDP, inflation	Cross-sectional time-series (panel data)	The bank's equity increases CB profitability only. Cost-to-income had a negative and significant impact on I&CB's performance. Size provides evidence of economies of scale in IB using ROE, while it is not significant for CB. Foreign ownership, the bank's age and banking development have no effect on I&CB's performance. GDP is positively correlated, while inflation is negatively correlated to the bank's profitability	2002– 2009	GCC countries
Riaz and Mehar (2013)	ROE, ROA	Bank-specific (asset size, credit risk, total deposits to total assets), and macroeconomic determinants (interest rate)	Multiple regression analysis	There is a significant impact of bank specific. Variables and macroeconomic. Indicator on ROE. Credit risk and interest rate also have a significant impact on ROA	2006–2010	Pakistan
Daly and Frikha (2015)	ROA, ROE and efficiency	Bank size, diversity of income, solvency ratio, market share, government effectiveness, quality regulatory	Data envelopment analysis (DEA)	Significant impact of income diversity, bank size, solvency indicators and loans to assets on the ROE of IB. Market share, solvency indicators and net loans to total assets have significant effects on the ROE for CB	2005– 2009	Bahrain

(*continued*)

Table 1.

Authors/ years	Dependent variables	Independent variables	Methodology	Main conclusions	Analysis period	Country/region
				Bank size is more significant concerning the ROA of IB		
Rashid and Jabeen (2016)	Financial performance index (FPI) based on CAMELS' ratios	Bank-specific variables, macroeconomic factors and financial indicators	GLS regression	Operating efficiency, reserves and overheads are significant determinants of CB performance, whereas operating efficiency, deposits and market concentration are significant in explaining IB performance	2006–2012	Pakistan
Zarrouk *et al.* (2016)	ROA, ROE, net profit margin	Liquidity, risk and solvency, efficiency, assets quality, non-financing revenues average assets, cost-to-income ratio. Market capitalization and macroeconomic variables (GDP)	System-generalized method of moment (GMM)	Profitability is positively affected by banks' cost-effectiveness, asset quality and level of capitalization. Non-financing activities allow IB to earn higher profits. IB performs better when GDP and investment are high. Similarities between determinants of profitability for both I&CB. The inflation rate, however, is negatively associated with IB profitability	1994–2012	MENA region
Matar and Eneizan (2018)	ROA	Leverage, firm size, liquidity, revenue and profitability	Regression analysis	Liquidity, profitability and revenues are positively related with ROA	2005–2015	Jordan
Muhindi and Ngaba (2018)	ROA		Descriptive survey design	There is a significant relationship between firm size and the financial performance of commercial banks	2012– 2016	Kenya
Buallay *et al.* (2021)	ROA, ROE and Tobin's Q	The integrated report index (IRI)	Cross-country analysis	IRI in CB positively affects market performance, while negatively affecting operational and financial performance. For IB, IRI negatively affects market	2012–2016	GCC countries

(*continued*)

Authors/ years	Dependent variables	Independent variables	Methodology	Main conclusions	Analysis period	Country/region
				performance, with no discernible effect on either financial or operational performance		
Wahab and Roslan (2021)	ROA	Efficiency, liquidity and risk	Meta-analysis of 73 samples of past journals and published thesis	There is no significant difference of performance between I&CB. Better performance of IB in comparison to CB. IB performs better during short-term periods while the long-term is dominated by CB. IB can performs better than CB in a region with strong government initiatives and community awareness of Islamic finance	Short-term, medium-term and long-term	Pakistan, Bangladesh and Malaysia
El-Chaarani *et al.* (2022)	ROA, ROE	Capital structure ratios, liquidity ratios, financial risk ratios, profitability and macro factors	Descriptive statistics, *T*-test, multiple regression and 2SLS and GMM models	There is a significant difference between I&CB during the crisis of COVID-19, where CB presented a higher level of return and liquidity than IB. CB revealed a higher capacity to manage their financial risk. A high level of nonperforming loans, a high inflation rate and a high percentage of nonimportant cost have a negative impact on the financial performance of IB, mainly during the pandemic. A high level of liquidity risk increased the performance of IB banks but this impact falls sharply during the pandemic period	2017–2020	GCC countries
Junjunan *et al.* (2022)	ROA, ROE	Independent sample *t*-test	The independent sample *t*-test and the Mann–Whitney rank test	There were significant differences in capital adequacy ratio, nonperforming loans/nonperforming financing, ROA, ROE, operating expense to operating income and loan to deposit ratio/financing to deposit ratio for both I&CB.	COVID-19 pandemi-c	Indonesia

(*continued*)

Table 1.

Table 1.

Authors/ years	Dependent variables	Independent variables	Methodology	Main conclusions	Analysis period	Country/region
El-Chaarani *et al.* (2023)	ROA, ROE	Credit risk, liquidity risk, capital structure, managerial efficiency	Multiple regressions, *t*-test	CB tends to have a better financial performance compared to IB during the COVID-19 pandemic The COVID-19 pandemic had a negative impact on profitability, leading to an increased credit risk, while it did not significantly affect capital adequacy. Managerial efficiency, bank size and GDP had a positive and significant impact on banks' return in both periods. Credit risk exerted a negative influence on ROE and ROA. Liquidity risk, capital adequacy and inflation did not significantly impact banks' returns	2018–2021	MENA region

Source: Author's own work

missing data were eliminated and the final sample includes 103 banks, as shown in Table 2 (the detailed list of banks is available on request). We started our analysis of comparison of the financial performance of I&CB applying a mean test (U-Mann Whitney for the period 2015–2019 and *t* student for 2020), and then, applying the GLS model.

We obtained the secondary data necessary for our analysis from a reliable source, datastream, a widely recognized and respected source of financial data, often used by researchers, analysts and financial professionals for its comprehensive and reliable information. This rigorous approach to sample selection and data collection ensures the robustness and validity of our findings, allowing us to draw meaningful conclusions regarding the financial performance of banks in the MENA region.

3.2 Dependent variable

The FPI has been developed based on the CAMEL parameters, a method introduced by the organisation for economic co-operation and development, following the method of Rashid and Jabeen (2016) slightly modified (see the definition of the CAMEL parameters in the Appendix). The construction of the FPI is divided into three steps. First, we standardized the values as follows:

$$\text{Standardized value } S_{ijt} = \left[\left(\beta_{ijt} - \mu_{jt}\right)/\sigma_{jt}\right]$$

where μjt denotes sample mean, σjt is the standard deviation of the CAMEL' parameter (jth indicator) at time *t* and βijt denotes the individual ratio of each CAMEL' parameter for a specific bank at time t. Standardization is important to obtain an appropriate result by combining the different scale variables into one scale variable. Second, we have multiplied these components according to the weight that each one has on bank performance. Specifically, we have used the same weights that are used in Mahmud and Rahman (2020). Then, the weight assigned to each component and the weighted rating was calculated. Specifically, CAMEL's parameters for each bank are calculated as follows:

$$\text{Capital adequacy}: \ CA_{it} = 0.20\, S1_{it}$$

$$\text{Asset quality}: \ AQ_{it} = 0.25_{t}\, S1_{it}$$

Country	Conventional banks	Islamic banks	Total
Bahrain	5	5	10
Egypt	10	3	13
Jordan	13	2	15
Kingdom of Saudi Arabia	7	4	11
Kuwait	6	5	11
Morocco	6	–	6
Qatar	5	3	8
Tunisia	11	1	12
United Arab Emirates	12	5	17
Total	*75*	*28*	*103*

Source: Author's own work

Table 2. MENA country's banks

$$\text{Management}: \text{MTit} = 0.25\,\text{S1}_{\text{it}}$$

$$\text{Earnings}: \text{ESit} = 0.20\,\text{S1}_{\text{it}}$$

$$\text{Liquidity}: \text{LYit} = 0.10\,\text{S1}_{\text{it}}$$

where S_{it} is a standardized value of the CAMEL parameter of i th bank at time t, whereas the FPI of each bank for each year is calculated as follows:

$$\text{FPI}_{\text{i}} = \alpha_{0+}\alpha_{\text{j1}}\text{CA}_{\text{it}} + \alpha_{\text{j2}}\text{AQ}_{\text{it}} + \alpha_{\text{j3}}\text{MT}_{\text{it}} + \alpha_{\text{j4}}\text{ES}_{\text{it}} + \alpha_{\text{j5}}\text{LY}_{\text{it}}$$

where α_j is the prescribed weight for banks i th at time t. CA_{it}, AQ_{it}, MT_{it}, ES_{it} and $LY_{it,}$ are the CAMEL' performance parameters for i th bank at time t.

This study analyzes the empirical determinants of bank performance by taking the FPI as the dependent variable, while bank-specific variables (overheads, reserves, bank size, deposits and operating efficiency), macroeconomic factors (GDP and Real interest rate) and financial market factors (marker capitalization and market concentration) act as independent variables. The independent variables are explained as follows:

3.3 Independent variables

3.3.1 Bank-specific variables

- *Overheads*: can be defined as the cost of operating in a business, a low percentage indicates a positive performance and proves the effectiveness of banks' performance when their costs decrease (Hassan and Bashir, 2003). It is calculated as follows:

$$\text{Overheads Ratio (OVHD)} = \text{overheads/total assets.}$$

- *Reserves*: are retained earnings generated by the bank. They are calculated by taking the value of the natural logarithm reserves from the balance sheet of a certain bank for a particular year (Rashid and Jabeen, 2016). This calculation is as follows:

$$\text{Reserves (RSRV)} = [\ln(\text{reserves})]$$

- *Bank size*: is calculated in our study as the natural log of book value of total assets. Therefore, its expression is:

$$\text{Bank Size (SZE)} = [\ln(\text{total bank assets})]$$

- *Deposits*: are the primary sources of bank financing, and they are expected to be one of the most important ratios that affect the performance of banks (Rashid and Jabeen, 2016). They are calculated as follows:

$$\text{Deposits ratio (DPST)} = [\text{deposit/equity}]$$

- *Operating efficiency*: displays how a business can efficiently use its assets and revenues. Therefore, it is calculated as the ratio of total expenditures that run a

business operation to the total revenues obtained from the business (Almazari, 2014).

$$\text{OE} = \text{total operating expenses}/\text{net interest income}$$

3.3.2 Macro indicators

- *GDP* : is the value of a country's goods and services produced within a certain period. It is often calculated at constant prices (Bikker and Hu, 2002). It is calculated as:

$$\text{GDP (cons.)} = [(\text{value of all produces} + \text{product taxes} - \text{subsidy not included in product value})]$$

- *Inflation rate* as the consumer price index.
- *Cellular use is* measured by the cellular telephone subscriptions to a public cellular telephone service that offers voice communications. The variable is obtained from the World Bank. In this work, it is used as a proxy for the degree of expansion or prevalence of electronic banking in the different countries studied.

4. Results and discoveries

4.1 Empirical findings

The results of the mean tests show that there are no significant differences between I&CB during the period analyzed. Thus, our results are in contradiction with studies that state a better financial performance of IB during recession years.

This section examines the determinants of profitability by using several variables reported in Table 3. As can be observed, Table 3 provides descriptive statistics for all the variables under investigation for both I&CB. Most of the variables present similar means in both types of banks. Nevertheless, it is striking that the dependent variable (FPI) presents different signs depending on the type of bank. To analyze this different sign, an ANOVA analysis of variance was performed reporting that the difference is not statistically significant. Thus, this preliminary result suggests that the two types of banks do not

Variables	Conventional banks Mean	SD	Islamic banks Mean	SD	ANOVA *F* statistic	Prob > *F*
FPI	0.123	3.00	−0.367	3.92	2.46	0.1170
Overheads	−2.15	0.93	−1.80	0.82		
Bank size	16.07	1.38	16.41	1.17		
Retained earnings	12.67	4.10	10.94	7.46		
Deposits	7.09	3.01	12.00	42.09		
Operating efficiency	0.936	0.73	0.716	0.560		
GDP (const.)	25.60	1.05	25.89	1.07		
Inflation	3.47	5.32	2.68	5.20		
Cellular	138.64	44.14	152.18	43.71		

Note: This table provides (Mean) and the variability SD of the observations and an ANOVA analysis performed for FPI
Source: Author's own work

Table 3. Descriptive statistics

present differences in the FPI. This finding is consistent with Wahab and Roslan's (2021) study.

To examine the influence of some of the determinants of bank performance, the following model has been estimated for I&CB separately:

$$FPI_{it} = \beta_0 + \beta_1 OVHD_{it} + \beta_2 RSRV_{it} + \beta_3 SZE_{it} + \beta_4 DPST_{it} + \beta_5 OE_{it} + \beta_6 GDP_{it} + \beta_7 IN_{it} + \beta_8 CE_{it} + \varepsilon_{it}$$

where i is the bank, t is the time period and ε_{it} represents error terms.

The samples used to estimate the proposed model are data panels. The characteristics of the samples indicate that a GLS regression should be estimated due to the autocorrelation and heteroskedasticity found [1]. In addition, the estimation of fixed effects (FE), random effects (RE) and ordinary least squares (OLS) has also been carried out to give robustness to the results obtained.

Our findings are presented in two separate tables. Table 4 displays the results on determinants of conventional banks' performances, while Table 5 shows the results on determinants of IB performances.

As observed in Table 4, our findings suggest that the financial performance of conventional banks in the MENA region is negatively affected by overhead costs. This outcome aligns with expectations, as overhead costs typically encompass nonrevenue-generating activities like administrative expenses, rent, utilities and salaries, which can significantly impact a bank's profitability when not managed efficiently. These results are consistent with previous studies (Rashid and Jabeen, 2016; Serwadda, 2018). Furthermore, the MENA region's reputation for high operational costs may exacerbate the negative impact of overhead costs on financial performance.

Our results also indicate that the size of a conventional bank does not have a significant impact on its financial performance. This finding is also at variance with the research by Zeitun (2012), which emphasized the substantial influence of bank size and the cost-to-income ratio on the performance of both I&CB. It differs as well from the findings of Muhindi and Ngaba (2018), which established a significant relationship between firm size and the financial performance of commercial banks in Kenya. This result suggests that a bank's financial performance is not solely dependent on its size. Larger banks may possess more resources and economies of scale, potentially reducing costs and increasing profits, while smaller banks may be more agile and responsive to changing market conditions and customer needs.

In contrast, our results reveal a positive influence of retained earnings on financial performance, consistent with Nduati and Wepukhulu (2020). Their research demonstrated that retained earnings had a favorable and significant effect on a bank's financial performance, as measured by ROA, ROE, and net interest margin. The significance of retained earnings can be explained by their use in profitable investments, improving capital positions and attracting investors.

Our findings also indicate a significant and adverse effect of deposits on conventional banks' performances, suggesting a negative correlation between deposits and financial performance. This aligns with the study by Joseph and Adelegan (2023) on Nigerian banks, which found that deposits had an unfavorable impact on banks' profitability during periods of low-interest rates. When interest rates were low, banks struggled to generate satisfactory returns on deposits, leading to decreased profitability. However, when interest rates were high, deposits had a positive impact on profitability, as banks could earn higher returns on their deposits.

Table 4. Determinants of conventional banks' performances

Panel effects	(1) Pooled OLS	(2)	(3)	(4)
Variables		RE	FE	GLS
Overheads (OVHD)	−1.010*** (0.240)	−0.203(0.390)	−0.448 (0.344)	−0.487*** (0.115)
Bank size (SZE)	0.0947 (0.155)	0.740 (0.853)	0.329 (0.257)	0.110 (0.102)
Retained earnings (RSRV)	0.442*** (0.0566)	0.322*** (0.0676)	0.344*** (0.0657)	0.280*** (0.0478)
Deposit (DPST)	−0.600*** (0.0685)	−0.445*** (0.130)	−0.509*** (0.0907)	−0.490*** (0.0385)
Operating efficiency (OE)	−0.157 (0.229)	0.485 (0.313)	0.220 (0.281)	−0.179 (0.170)
GDP (const.)	0.488*** (0.123)	1.004 (2.835)	0.363 (0.233)	0.562*** (0.107)
Inflation (in)	0.0212 (0.0291)	0.0136 (0.0283)	0.00983 (0.0289)	0.0289* (0.0153)
Cellular (CE)	−0.00372 (0.00281)	−0.00255 (0.00541)	−0.00471 (0.00428)	−0.00411** (0.00209)
Constant	−17.09*** (2.773)	−39.52 (76.10)	−16.08*** (4.655)	−16.84*** (2.418)
Observations	354	354	354	354
R-squared	0.636	0.480		
Number of banks		59	59	59

Notes: Robust standard errors in parentheses; ***$p < 0.01$; **$p < 0.05$ and *$p < 0.1$. The table displays the results of a study that investigated the financial performance of conventional banks in the MENA region using four different estimation methods: pooled OLS, panel effects, fixed effects and generalized least squares (GLS). The variables examined in this study include Overheads (OVHD), Bank size (SZE), Retained earnings (RSRV), Deposits (DPST), Operating efficiency (OE), GDP (const.), Inflation (IN) and Cellular (CE)
Source: Author's own work

Table 5.
Determinants of Islamic banks' performances

Variables	(1) Pooled OLS	(2) FE	(3) RE	(4) GLS
Overheads (OVHD)	−0.410 (0.405)	−1.083 (0.718)	−1.428* (0.764)	−0.749** (0.300)
Bank size (SZE)	0.414 (0.420)	−3.304 (2.064)	0.0145 (0.845)	0.881*** (0.271)
Retained earnings (RSRV)	0.108** (0.0486)	0.232*** (0.0783)	0.190*** (0.0549)	0.124*** (0.0353)
Deposit (DPST)	−0.00744** (0.00310)	−0.00652** (0.00281)	−0.00339 (0.00227)	−0.0121 (0.00833)
Operating efficiency (OE)	−1.010 (0.648)	1.812 (1.291)	−0.159 (1.096)	−0.550 (0.511)
GDP (const.)	0.606 (0.400)	−10.82** (4.660)	0.424 (0.753)	0.581* (0.308)
Inflation (IN)	−0.185*** (0.0653)	−0.0503 (0.0665)	0.0100 (0.0493)	−0.0107 (0.0376)
Cellular (CE)	−0.00300 (0.0112)	−0.000124 (0.0196)	0.0154 (0.0129)	−0.00338 (0.00532)
Constant	−22.94** (10.05)	328.4** (133.2)	−18.39 (20.63)	−31.68*** (6.908)
Observations	149	149	149	149
R-squared	0.245	0.157		
Number of banks		25	25	25

Notes : Robust standard errors in parentheses; ***$p < 0.01$, **$p < 0.05$ and *$p < 0.1$. The table displays the results of a study that investigated the financial performance of Islamic banks in the MENA region using four different estimation methods: pooled OLS, panel effects, fixed effects and generalized least squares (GLS). The variables examined in this study include Overheads (OVHD), Bank size (SZE), Retained earnings (RSRV), Deposits (DPST), Operating efficiency (OE), GDP (const.), Inflation (IN) and Cellular (CE)
Source: Author's own work

Regarding operating efficiency, our results suggest that its impact on financial performance was not significant. This implies that further improvements in operating efficiency may not lead to substantial financial gains for banks. This finding contradicts the study by Rashid and Jabeen (2016), which identified operating efficiency, reserves and overheads as significant determinants of conventional banks' performances.

Furthermore, our study examines the effect of macroeconomic factors on the financial performance of conventional banks. The results indicate a significant positive impact of GDP and inflation on financial performance in the MENA region. This implies that economic growth is a crucial factor in enhancing the financial performance of banks in this region. A growing economy often indicates a stable business environment that attracts more foreign investment and leads to increased deposits for banks. Similarly, the positive impact of inflation on financial performance can be attributed to higher interest rates, which result in increased interest income for banks. Additionally, inflation can stimulate a higher demand for credit, leading to increased lending and higher profits for banks. These findings align with studies conducted by Raiz and Maher (2013) and Quoc Trung (2021).

Regarding the variable named "Cellular," our results indicate that the use of cellular phones and cellular banking services has a significant and negative impact on conventional banks' financial performance. This suggests that increased competition and operational costs associated with the widespread use of cellular technology may have reduced banks' profitability.

Table 5 presents the findings of our study regarding IB, highlighting that overhead costs exert a significant negative impact on financial performance, while bank size has a notable positive influence. The positive correlation between bank size and financial performance within IB suggests that larger institutions are generally better equipped to withstand economic challenges and are poised to capitalize on market growth opportunities. These outcomes align with prior research, such as that of Daly and Frikha (2015), who observed that larger IBs in Bahrain demonstrated superior profitability and risk management compared to smaller counterparts. Similarly, Zarrouk *et al.* (2016) found a positive association between bank size and financial performance among IB in the MENA region, with larger banks displaying higher profitability and asset quality.

Our research emphasizes the significant enhancement of IB's performances through retained earnings. In essence, preserving earnings rather than disbursing dividends yields superior financial outcomes. Furthermore, aligning dividend policies with retained earnings can reduce share-price volatility, fostering market stability. This finding corroborates Al-Fayed's study (2017) underscoring the critical role of prudent dividend decisions for IB to compete effectively in local and global deposit markets. Avoiding erratic dividend distributions that fail to signal market strength becomes crucial, as such practices could hinder capital acquisition and investor attraction, given their comparatively lower dividend yields compared to conventional banks.

Regarding the impact of other factors in IB, such as deposits, operating efficiency, inflation and cellular phone penetration, they are not statistically significant. The absence of a substantial impact of deposits on IB performances can be attributed to several factors. One plausible explanation is that IB operate within a distinct financial system compared to conventional banks, wherein deposits do not constitute the primary funding source. IB, instead, rely on diverse financing techniques such as leasing, profit sharing and asset-based financing, which offer a more stable and diversified funding source than deposits. This finding concurs with a study conducted by Rashid and Jabeen (2016), which noted that operating efficiency, reserves and overheads significantly influence conventional banks'

performances, while operating efficiency, deposits and market concentration significantly explain IB performances.

The absence of a notable impact of inflation on IB performances can also be explained by various factors. One plausible reason is that IB operates within a distinct financial system compared to conventional banks, where interest rates serve as the primary tool for managing inflation. Instead, IB rely on profit sharing and other noninterest-based financing methods, which may be less sensitive to fluctuations in inflation rates. This result contradicts the findings of Zeitun (2012), which highlighted the significant impact of GDP and inflation on banking performance. Additionally, the study revealed the substantial influence of bank size and the cost-to-income ratio on the performance of both I&CB.

In line with conventional banks, the Islamic bank's results show that a strong GDP has a favorable effect on financial performance. The GDP is an indicator of economic health and stability, and a strong performance in this area typically suggests a stable economy with reduced risks. This can have a positive impact on the performance of I&CB since both types of banks face similar risk factors in the economy.

4.2 Theoretical and practical implications

The theoretical implications of the research paper lie in the distinct ethical principles that constitute the foundation of Islamic finance. The study underscores the profound impact of Quranic verses and prophetic hadiths addressing the prohibition of Riba, thereby emphasizing the ethical underpinning of Islamic finance. Illustrated in Surah Al-Baqarah (2:275–279) with the statement "But Allah permitted commerce, and He prohibited usury," and echoed in the Hadith from Sahih Muslim (1598a) which states, "Allah's Messenger (ﷺ) cursed the accepter of Riba and its payer, and one who records it, and the two witnesses, and he said: They are all equal". This theoretical framework provides a distinctive perspective for scrutinizing economic activities and the operational landscape of IB, contributing to a more profound comprehension of the ethical considerations guiding their financial practices. The differentiation between positive principles, such as the payment of Zakat linked to real economic activity and negative principles, including the prohibition of Riba, condemnation of financing an illicit sector and prohibition of speculative "Gharar" illustrates the comprehensive ethical framework shaping Islamic financial institutions (Daly and Frikha, 2017).

On a practical level, the study underscores the significance of efficient overhead cost management for conventional banks, particularly in the context of a rapidly evolving digital banking environment. The call for adaptation and innovation in operational strategies aligns with the broader principles of efficiency and effectiveness emphasized in Islamic finance. The point of conventional banks further raises the issue of operational efficiency and the inevitable increase in overhead cost management. To be competitive with the advancing technology and financial governance, traditional banks must simplify their operations by adopting the technology and will regulate themselves in a prudent and financially aware manner. In addition, the retained earnings plan is sought by investors as another essential step for continuous growth.

The ethical opposition to Riba is poised to have extensive social implications, influencing market stability, commercial and economic impact and contributing to responsible banking practices within the Islamic banking sector. The study suggests that adherence to these sacred principles not only aligns with ethical considerations but also fosters social responsibility within Islamic banking institutions. This holds significance for broader societal and economic impacts, as responsible banking practices contribute to sustainable and equitable economic development.

The size of IB positively influences their financial performance, suggesting that larger banks are more adept at navigating market fluctuations in the MENA region. This relationship underscores the importance of scale in enhancing the competitiveness and sustainability of IB. Policymakers, regulators and industry stakeholders should, therefore, encourage the growth and expansion of IB to enhance their performance and contribution to the financial landscape. Additionally, consolidation or strategic partnerships could be advantageous for IB, as they can improve their size and resilience to economic changes, enabling them to capitalize on economies of scale. Prioritizing growth and scaling strategies may have the potential to fortify the Islamic banking sector and facilitate sustainable economic development and financial inclusion in the MENA region.

Both conventional and IB in the MENA region should explore digital solutions and technologies to enhance their popularity, thereby creating significant opportunities for industry growth. Additionally, it is essential for both types of banks to incorporate religious-based ethical standards along with educational initiatives to foster their development. These consequences fundamentally reinforce the objective of insightful planning and refining strategies to brave the shifts and turn in the panorama of the banking industry.

In essence, the theoretical, practical and social implications of the study surpass the narrow focus on financial performance, resonating with the broader societal, economic and educational landscape within the Islamic banking sector. The integration of ethical principles not only reinforces the unique identity of Islamic finance but also positions it as a model for responsible and sustainable banking practices in the MENA region and beyond.

5. Conclusion

This study provides valuable insights into the financial performance of I&CB in the MENA region. Our analysis has illuminated various factors influencing their performance, emphasizing the significance of efficient overhead cost management for conventional banks, particularly in the evolving digital banking landscape. Therefore, to ensure profitability, these conventional institutions must prioritize strategies that improve operational efficiency. Moreover, the study challenges the conventional belief that the size of a bank alone guarantees financial success, highlighting the potential for smaller, more agile banks to thrive. It also underscores the positive impact of retained earnings on the financial performance of both bank types, suggesting potential benefits in terms of market stability when aligning dividend policies with retained earnings. Deposit management is identified as a crucial consideration for both conventional and IB, with the former needing strategies to retain deposits during periods of low interest rates and the latter encouraged to diversify financing techniques due to their unique funding sources. Additionally, the study suggests that further enhancements in operating efficiency may not yield significant financial gains, prompting exploration into diversified growth avenues. Moreover, the study reiterates the positive correlation between GDP growth and banks' financial performances, emphasizing the central role of economic health in shaping profitability. This provides insights for MENA banks and strategic direction for governments and industry stakeholders. Quranic verses emphasize ethical conduct, fairness and justice in economic transactions, providing a moral framework for financial activities.

While this study offers valuable insights, it is essential to acknowledge its limitations. The research focuses on a specific region (MENA) and may not be universally applicable to other geographical areas or banking systems. The study's findings are based on historical data and might not fully reflect current or future market conditions. Additionally, the choice of variables and methodology may introduce bias or limitations, as with any empirical

study. Future research could benefit from a broader geographical scope and more up-to-date data to further enhance the generalizability of the findings and address these limitations.

Note

1. The results of the Wooldridge autocorrelation test and the Wald heteroskedasticity test are found in Appendix.

References

Abasimel, N.A. (2023), "Islamic banking and economics: concepts and instruments, features, advantages, differences from conventional banks, and contributions to economic growth", *Journal of the Knowledge Economy*, Vol. 14 No. 2, pp. 1923-1950, doi: 10.1007/s13132-022-00940-z.

Abou-Youssef, M.M.H., Kortam, W., Abou-Aish, E. and El-Bassiouny, N. (2015), "Effects of religiosity on consumer attitudes toward Islamic banking in Egypt", *International Journal of Bank Marketing*, Vol. 33 No. 6, pp. 786-807, doi: 10.1108/IJBM-02-2015-0024.

Abu Huson, Y., Sierra-García, L. and Garcia-Benau, M.A. (2024), "A bibliometric review of information technology, artificial intelligence, and blockchain on auditing", *Total Quality Management and Business Excellence*, Vol. 35 Nos 1/2, pp. 91-113, doi: 10.1080/14783363.2023.2256260.

Ahsan, T. and Qureshi, M. (2022), "The impact of Islamic banking model and Islamic financial development on bank performance: evidence from dual banking economies", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 15 No. 3, pp. 602-625, doi: 10.1108/IMEFM-05-2020-0248.

Akala, I. (2018), "Comparing financial performances of conventional and participation banks: case of Turkey (2005 – 2015)", *International Journal of Inspiration and Resilience Economy*, Vol. 2 No. 1, pp. 11-17, doi: 10.5923/j.ijire.20180201.02.

Al Zaidanin, J.S. (2020), "Bank specific and macro-economic determinants of the United Arab Emirates commercial banks profitability: a panel data analysis", *International Journal of Advanced Research*,), Vol. 8 No. 10, pp. 661-667.

Albalawee, N., Huson, Y., Budair, Q., Alqmool, T. and Arasheedi, N. (2024), "Connecting legal compliance and financial integrity: a bibliometric survey of accounting practices in the corporate supply chain", *Uncertain Supply Chain Management*, Vol. 12 No. 2, pp. 893-906, doi: 10.5267/j.uscm.2023.12.01.

Ali, A., Bashir, M.F. and Afridi, M.A. (2021), "Do Islamic banks perform better than conventional banks?", doi: 10.26414/A082.

Al-Kayed, L.T. (2017), "Dividend payout policy of Islamic vs conventional banks: case of Saudi Arabia", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 10 No. 1, pp. 117-128, doi: 10.1108/IMEFM-09-2015-0102.

Almazari, A.A. (2014), "Impact of internal factors on bank profitability: comparative study between Saudi Arabia and Jordan", *Journal of Applied Finance and Banking*, Vol. 4 No. 1, pp. 125-140.

Al-Qudah, L.A., Ahmad Qudah, H., Abu Hamour, A.M., Abu Huson, Y. and Al Qudah, M.Z. (2022), "The effects of COVID-19 on conditional accounting conservatism in developing countries: evidence from Jordan", *Cogent Business and Management*, Vol. 9 No. 1, p. 2152156, doi: 10.1080/23311975.2022.2152156.

Anouze, A.L.M., Alamro, A.S. and Awwad, A.S. (2019), "Customer satisfaction and its measurement in Islamic banking sector: a revisit and update", *Journal of Islamic Marketing*, Vol. 10 No. 2, pp. 565-588, doi: 10.1108/JIMA-07-2017-0080.

Bawaneh, A.A. and Dahiyat, A. (2019), "Performance measurement of commercial banks in Jordan using the camels rating system", *Academy of Accounting and Financial Studies Journal*, Vol. 23 No. 6, pp. 1-7.

Bikker, J.A. and Hu, H. (2002), "Cyclical patterns in profits, provisioning and lending of banks and procyclicality of the new Basel capital requirements", *PSL Quarterly Review*, Vol. 55 No. 221, doi: 10.13133/2037-3643/9907.

Bilal, Z.O., Durrah, O.M. and Atiya, T.M. (2016), "Comparative study on performance of Islamic banks and conventional banks: Evidence from Oman", *International Journal of Economics and Financial Issues*, Vol. 6 No. 4, pp. 1835-1841, available at: https://dergipark.org.tr/en/pub/ijefi/issue/32045/354727

Boto-García, D., Álvarez, A. and Pino, J.F.B. (2021), "The effect of Euribor on banking profitability: evidence from the spanish banking system", *European Journal of Government and Economics*, Vol. 10 No. 1, pp. 5-29, doi: 10.17979/ejge.2021.10.1.7083.

Buallay, A., Al Hawaj, A.A. and Hamdan, A. (2021), "Integrated reporting and performance: a cross-country comparison of GCC Islamic and conventional banks", *Journal of Islamic Marketing*, Vol. 12 No. 8, pp. 1619-1636, doi: 10.1108/JIMA-08-2017-0084.

Caporale, G.M., Spagnolo, F. and Spagnolo, N. (2018), "Macro news and bond yield spreads in the euro area", *The European Journal of Finance*, Vol. 24 No. 2, pp. 1-23, doi: 10.1080/1351847X.2017.1285797.

Casey, E. and O'Toole, C.M. (2014), "Bank lending constraints, trade credit and alternative financing during the financial crisis: evidence from European SMEs", *Journal of Corporate Finance*, Vol. 27, pp. 173-193, doi: 10.1016/j.jcorpfin.2014.05.001.

Chen, N., Liang, H. and Yu, M. (2018), "Asset diversification and bank performance: evidence from three Asian countries with a dual banking system", *Pacific-Basin Finance Journal*, Vol. 52, pp. 40-53, doi: 10.1016/j.pacfin.2018.02.007.

Choong, Y.V., Thim, C.K. and Kyzy, B.T. (2012), "Performance of Islamic commercial banks in Malaysia: an empirical study", *Journal of Islamic Economics, Banking and Finance*, Vol. 8 No. 2, pp. 67-79.

Daly, S. and Frikha, M. (2015), "Determinants of bank performance: comparative study between conventional and Islamic banking in Bahrain", *Journal of the Knowledge Economy*, Vol. 8 No. 2, pp. 471-488, doi: 10.1007/s13132-015-0261-8.

Daly, S. and Frikha, M. (2017), "Determinants of bank performance: comparative study between conventional and Islamic banking in Bahrain", *Journal of the Knowledge Economy*, Vol. 8 No. 2, pp. 471-488, doi: 10.1007/s13132-015-0261-8.

El Khoury, R., Nasrallah, N. and Alareeni, B. (2021), "The determinants of ESG in the banking sector of MENA region: a trend or necessity?", *Competitiveness Review*, doi: 10.1108/CR-09-2021-0118.

El-Chaarani, H., Ismail, T.H., El-Abiad, Z. and El-Deeb, M.S. (2022), "The impact of COVID-19 on financial structure and performance of Islamic banks: a comparative study with conventional banks in the GCC countries", *Journal of Economic and Administrative Sciences, (Ahead-of-Print)*, doi: 10.1108/JEAS-07-2021-0138.

El-Chaarani, H., Skaf, Y., Roberto, F., Hamdan, A. and Binsaddig, R.O. (2023), "Assessing the direct and moderating effect of COVID-19 on the performance of the banking sector in the MENA region", *FIIB Business Review*, doi: https://doi.org/10.1177/23197145221137962.

Fernandes, C., Farinha, J., Martins, F.V. and Mateus, C. (2018), "Bank governance and performance: a survey of the literature", *Journal of Banking Regulation*, Vol. 19 No. 3, pp. 236-256, doi: 10.1057/s41261-017-0045-0.

Grassa, R. (2015), "Shariah supervisory systems in Islamic finance institutions across the OIC member countries: an investigation of regulatory frameworks", *Journal of Financial Regulation and Compliance*, Vol. 23 No. 2, pp. 135-160, doi: 10.1108/JFRC-02-2014-0011.

Haque, F. and Brown, K. (2017), "Bank ownership, regulation and efficiency: perspectives from the Middle east and North africa (MENA) region", *International Review of Economics and Finance*, Vol. 47, pp. 273-293, doi: 10.1016/j.iref.2016.10.015.

Hassan, M.K., İslam, M.T., Ahmed, Z. and Sarker, J.I. (2023), "Islamic banking in Bangladesh: a literature review and future research agenda", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 16 No. 5, doi: 10.1108/IMEFM-05-2022-0185.

Hassan, M.K. and Bashir, A.H.M. (2003), "Determinants of Islamic banking profitability", 10th ERF annual conference, *Morocco*, Vol. 7, pp. 2-31.

Hoepner, A.G., Rammal, H.G. and Rezec, M. (2015), "Islamic mutual funds' financial performance and international investment style: evidence from 20 countries", *Contemporary Issues in Financial Institutions and Markets:*, Vol. 1 No. 1, p. 64.

Huson, Y.A.A., Sierra-García, L., Garcia-Benau, M.A. and Aljawarneh, N.M. (2024), "Empirical investigation into the integration of cloud-based artificial intelligence in auditing", *Pressacademia*, Vol. 18 No. 1, pp. 113-114, doi: 10.17261/Pressacademia.2023.1874.

Jaara, O., Kadomi, A., Ayoub, M., Senan, N. and Jaara, B. (2021), "Attitude formation towards islamic banks", *Accounting*, Vol. 7 No. 2, pp. 479-486, doi: 10.5267/j.ac.2020.11.002.

Joseph, I.E. and Adelegan, O. (2023), "Liquidity management and financial performance of deposit money banks in Nigeria", Available at SSRN, doi: 10.2139/ssrn.4349839.

Juergensen, J., Guimón, J. and Narula, R. (2020), "European SMEs amidst the COVID-19 crisis: assessing impact and policy responses", *Journal of Industrial and Business Economics*, Vol. 47 No. 3, pp. 499-510, doi: 10.1007/s40812-020-00169-4.

Junjunan, M.I., Nawangsari, A.T., Melania, A.A. and Putikadyanto, A.P.A. (2022), "A comparative study on financial performance between Islamic and conventional banking in Indonesia during the COVID-19 pandemic", *Muqtasid: Jurnal Ekonomi Dan Perbankan Syariah*, Vol. 12 No. 2, pp. 75-88, doi: http://dx.doi.org/10.18326.

Kassim, S. (2016), "Islamic finance and economic growth: the Malaysian experience", *Global Finance Journal*, Vol. 30, pp. 66-76, doi: 10.1016/j.gfj.2015.11.007.

Keffala, M.R. (2018), "Analyzing the effect of derivatives on the financial soundness of commercial banks in Italy: an approach based on the CAMELS framework", *Review of Financial Economics*, Vol. 36 No. 3, pp. 267-283, doi: 10.1002/rfe.1020.

Kocenda, E. and Iwasaki, I. (2022), "Bank survival around the world: a meta-analytic review", *Journal of Economic Surveys*, Vol. 36 No. 1, pp. 108-156, doi: 10.1111/joes.12451.

Mahmud, A. and Rahman, M.H. (2020), "Evaluation and comparison of financial soundness of Islamic and conventional private commercial banks in Bangladesh: a CAMEL approach", *Canadian Journal of Business and Information Studies*, Vol. 2 No. 6, pp. 129-140, doi: 10.34104/cjbis.020.01290140.

Matar, A. and Eneizan, B.M. (2018), "Determinants of financial performance in the industrial firms: evidence from Jordan", *Asian Journal of Agricultural Extension, Economics and Sociology*, Vol. 22 No. 1, pp. 1-10.

Miah, M.D. and Sharmeen, K. (2015), "Relationship between capital, risk and efficiency: a comparative study between Islamic and conventional banks of Bangladesh", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 8 No. 2, pp. 203-221, doi: 10.1108/IMEFM-03-2014-0027.

Muhindi, K. and Ngaba, D. (2018), "Effect of firm size on financial performance on banks: case of commercial banks in Kenya", *International Academic Journal of Economics and Finance*, Vol. 3 No. 1, pp. 175-190.

Nduati, N.W. and Wepukhulu, J.M. (2020), "Effect of retained earnings on financial performance of saving and credit co-operative societies in Nairobi county", *Kenya. International Academic Journal of Economics and Finance*, Vol. 3 No. 6, pp. 197-209.

Qudah, H., Malahim, S., Airout, R., AlQudah, M.Z., Al-Zoubi, W.K., Huson, Y.A. and Zyadat, A. (2024), "Unlocking the ESG value of sustainable investments in cryptocurrency: a bibliometric review of research trends", *Technology Analysis and Strategic Management*, pp. 1-15, doi: 10.1080/09537325.2024.2308631.

Quoc Trung, N.K. (2021), "Determinants of bank performance in Vietnamese commercial banks: an application of the camels model", *Cogent Business and Management*, Vol. 8 No. 1, p. 1979443, doi: 10.1080/23311975.2021.1979443.

Rashid, A. and Jabeen, S. (2016), "Analyzing performance determinants: Conventional versus Islamic banks in Pakistan", *Borsa Istanbul Review*, Vol. 16 No. 2, pp. 92-107, doi: 10.1016/j.bir.2016.03.002.

Salman, A. and Nawaz, H. (2018), "Islamic financial system and conventional banking: a comparison", *Arab Economic and Business Journal*, Vol. 13 No. 2, pp. 155-167, doi: 10.1016/j.aebj.2018.09.003.

Serwadda, I. (2018), "Determinants of commercial banks ' profitability", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, Vol. 66 No. 5, pp. 1325-1335, doi: 10.11118/actaun201866051325.

Shahin, W. and El-Achkar, E. (2016), *Banking and Monetary Policies in a Changing Financial Environment: A Regulatory Approach*, Taylor and Francis, New York, NY.

Teker, S., Teker, D. and Kent, O. (2011), "Measuring commercial banks' performances in Turkey: a proposed model", *Journal of Applied Finance and Banking*, Vol. 1 No. 3, p. 97.

Wahab, H.A. and Roslan, M.N.I.M. (2021), "The comparative performance of Islamic and conventional banks: a meta-analysis", *Middle East J. of Management*, Vol. 8 Nos 2/3, pp. 199-218, doi: 10.1504/MEJM.2021.113990.

Zarrouk, H., Ben Jedidia, K. and Moualhi, M. (2016), "Is Islamic bank profitability driven by same forces as conventional banks?", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 9 No. 1, pp. 46-66, doi: 10.1108/IMEFM-12-2014-0120.

Zeitun, R. (2012), "Determinants of Islamic and conventional banks performance in GCC countries using panel data analysis", *Global Economy and Finance Journal*, Vol. 5 No. 1, pp. 53-72, available at: https://studycrumb.com/alphabetizer

Further reading

Arellano, M. and Bond, S. (1991), "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations", *The Review of Economic Studies*, Vol. 58 No. 2, pp. 277-297, doi: 10.2307/2297968.

Arellano, M. and Bover, O. (1995), "Another look at the instrumental variable estimation of error-components models", *Journal of Econometrics*, Vol. 68 No. 1, pp. 29-51, doi: 10.1016/0304-4076.(94)01642-D.

Blundell, R. and Bond, S. (1998), "Initial conditions and moment restrictions in dynamic panel data models", *Journal of Econometrics*, Vol. 87 No. 1, pp. 115-143, doi: 10.1016/S0304-4076(98)00009-8.

Appendix

Table A1. Breuch and Pagan Test for Inquiring Panel Effects

Conventional Banks		Islamic Banks	
H_0: No Panel Effects $X^2(01) = 322.98$ p-value = 0.0000	If H_0 is rejected (p-value < 0.05) → there are panel data effect → Random or Fixed effects could be used	H_0: No Panel Effects $X^2(01) = 118.09$ p-value = 0.0000	If H_0 is rejected (p-value < 0.05) → using a panel data model of fixed or random effects

Source: Author's Own Work

Table A2. Hausman Test - Choice between Fixed and Random Effects

Conventional Banks		Islamic Banks	
H_0: Difference in coefficients not systematic $\chi^2(6) = 28.58$ p-value = 0.0001	If H_0 is rejected (p-value < 0.05) → the fixed effects model should be use	H_0: Difference in coefficients not systematic $\chi^2(6) = 18.06$ p-value = 0.0061	If H_0 is rejected (p-value < 0.05) → the fixed effects model should be use

Source: Author's Own Work

Table A3. Wooldridge Test for Serial Correlation

Conventional Banks		Islamic Banks	
H_0: No first-order autocorrelation F (1, 57) = 18.851 p-value = 0.0001	If H_0 is rejected (p-value < 0.05) → there is serial correlation	H_0: No first-order autocorrelation F (1, 25) = 9.412 p-value = 0.0051	If H_0 is rejected (p-value < 0.05) → there is serial correlation

Source: Author's Own Work

Table A4. Modified Wald Test for Group Wise Heteroskedasticity

Conventional Banks		Islamic Banks	
H_0: $\sigma_i^2 = \sigma$ for all i $\chi^2(58) = 24998.38$ p-value = 0.0000	If H_0 is rejected (p-value < 0.05) → there is heteroskedasticity	H_0: $\sigma_i^2 = \sigma$ for all i $\chi^2(26) = 7755.73$ p-value = 0.0000	If H_0 is rejected (p-value < 0.05) → there is heteroskedasticity

Source: Author's Own Work

CAMELS	RATIO	MEANING
C Capital adequacy	shareholders equity/total assets	It means the bank's capital adequacy and its ability to deal with losses and face risks. This ratio indicates whether the bank needs external financing to support the capital in the event of its decline
A Asset quality	Non-performing loan/total assets	It is the amount of risky and non-performing assets owned by the bank and is determined as a percentage of total assets
M Management soundness	Cost to income	It is the management's ability to achieve the highest income at the lowest costs, and this is an indication of the management's efficiency in dealing with conditions and risk factors
E Earnings	ROA	This ratio is the profitability of the bank, as it is the bank's ability to regularly earn income from its activities
L Liquidity	Loan to deposit	It is the ability of the bank to meet its obligations as they arise

Source: Author's Own Work

Table A5.
CAMELS Parameters

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