THE IMPACT OF BASEL III CAPITAL AND LIQUIDITY REGULATIONS ON BANK PROFITABILITY IN EMERGING MARKETS

By

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DECLARATION

Except as otherwise noted and acknowledged, I, Mompoloki Keseabetswe, affirm that the research work I have included in my dissertation is original to me. It is submitted to the University of the Witwatersrand, Johannesburg, for the Master of Management degree. No other university has received this thesis, in whole or in part, for credit toward a degree or diploma.

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ABSTRACT

The purpose of the study is to investigate how Basel III's regulation for capital and liquidity impacts the profitability of banks in emerging markets. Using data from 2012 to 2022, the research looks at listed banks in 22 emerging market countries. The study measured bank profitability using two proxies: return on equity and return on assets. The study considered several bank-specific and macroeconomic variables. For bank-specific drivers, this includes capital, liquidity, bank size, cost-effectiveness, and credit quality, while macroeconomic factors include economic growth measured in gross domestic product growth, inflation, and interest rate. Dynamic panel data (system GMM) was employed to examine the relationship between the variables.

The results reveal that the Basel requirements have a limited impact on bank profitability. The findings for banks subject to Basel III regulation show a significant and positive impact of capital on bank profitability and no impact of liquidity on bank profitability. For banks under no Basel III regime, the results show a significant and negative impact of liquidity on bank profitability but show no statistical significance and impact of capital on bank profitability. Comparatively, capital positively impacts bank profitability for Basel III banks, while liquidity negatively impacts bank profitability for non-Basel III banks in emerging markets. By conducting an empirical analysis of the effects of capital and liquidity requirements on bank performance for banks in emerging market countries, this study supplements the body of literature. Although the Basel III framework is important for prudential banking, its effects on the performance of emerging market banks are, therefore, varied, and debatable.

DEDICATION

I dedicate my master's degree and this thesis to my family, without whose help, love, and support I could not have reached such a significant life milestone:

- My wife Botsang Keseabetswe and daughter Amari Keseabetswe for their affection, encouragement, comprehension, and sleepless evenings spent apart from you.

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1.0 INTRODUCTION

1.1 Background

Economic growth theory holds that financial institutions, particularly banks, are crucial for spurring economic growth as the primary financiers of the national economy (Schumpeter, 1911, as cited in Becker and Knudsen (2003). As a result, banks are fundamental to any modern economy. The banking sector provides loan facilities to support productive operations (Kashyap et al., 2017), the effectiveness of which, according to Rahman et al. (2015), may be assessed through bank profitability. Notwithstanding, prudential rules established by the Basel Committee on Banking Supervision (BCBS) govern how banks conduct their business (Basel Committee Charter, 2018). The BCBS, therefore, sets regulatory and supervisory guidelines. Basel III, the third iteration of the Basel Accords, added new and improved guidelines with stricter definitions of capital to enhance the capital base's uniformity, transparency, and quality (Shakdwipee & Mehta, 2017). Moreover, a global liquidity standard was introduced. The goal of the liquidity standard, according to Bindseil and Lamoot (2011), was to foster robust liquidity buffers for banks to reinforce their resilience to liquidity shocks.

The global financial crisis triggered a reassessment of bank regulatory frameworks to strengthen the resilience of financial systems and institutions (Kasekende et al., 2012). According to Ozili (2015), theoretical and empirical banking research increased significantly following the change in bank regulation. Some parts of the literature maintain that there are substantial macroeconomic advantages to changing regulatory guidelines. Even so, there have been debates over whether the change is desirable, particularly in emerging market economies. According to Swamy (2018), the Basel III standards have a significant effect on banks and impact how they make decisions daily about lending, capital, liquidity, and operations. Together, all these areas are interrelated and have a direct impact on the profitability of a bank (Swamy, 2018). A relevant question that must be investigated is whether these regulations constrain the profitability of banks within emerging market economies where financial intermediation is a necessity to promote much-needed economic growth.

1.2 Research Gap

According to Beck and Rojas-Suarez (2019), reducing the risk brought on by financial system instability requires a strong financial regulatory framework. To ensure financial stability, academics, researchers, and regulators identified several factors and pushed for strict prudential regulation (Majumder & Li, 2018). Regulators in emerging market economies cannot simply disregard international standards in a globalized financial landscape, even if those standards are inappropriate for their regulatory context (Jones et al., 2018). The regulators consider and adopt Basel requirements because they see it as in their long-term interest (Beck & Rojas-Suarez, 2019). Jones et al. (2018) claim that one of the only ways regulators may let international investors and other regulators know that their banks are well-regulated is through the adoption of international standards. However, regulations are important factors that could be beneficial or detrimental to banks' performance (Oyetade et al., 2022). Few studies have been reported on the impact of Basel III requirements on bank performance for developing and emerging market economies.

Swamy (2018) work reflected on the impact of new capital regulations proposed under the Basel III framework on bank profitability in India and presented empirical evidence that banks tend to experience a rise in interest income. Mashamba (2018) evaluated the impact of new Basel III liquidity regulations on the profitability of banks in emerging market economies and observed that the liquidity coverage ratio of the liquidity requirements of the Basel III framework increased the profitability of banks in emerging markets. However, based on the Basel Committee's evaluation of Basel III liquidity coverage ratio regulations consistency under the regulatory consistency assessment program, Mashamba (2018) analysis only considered countries that had fully implemented the liquidity standard as of 31 December 2016. This study seeks to expand on these works to further ascertain the distinctive impact of the adoption and implementation of both the Basel III regulations on bank performance for emerging markets. This study is unique in that it considers both banks that have not yet adopted Basel III and all emerging market banks that are subject to the regulations. This would make it possible to compare the effects of the standards between markets that have implemented them and those that have not. Additionally, the simultaneous effects of both regulations are considered. This is to test for contrast based on the idiosyncrasy of the financial system of these economies.

1.3 Objectives of the Study

Regulation and supervision act as a safety net for banks and can maintain the stability of fragile banking systems (Kroszner, 1998). Although regulation is crucial to the safety and soundness of the banking system, understanding its consequences, particularly on bank performance, given the essential roles that banks play in an economy, is important. Yang et al. (2019) explain that regulation and supervision are often associated with extra costs for banks. Durand (2019) stated that the implementation of Basel III regulations may impact a bank's profitability, which could retrospectively affect the financial stability it looks to improve. This study's primary goal is to examine how Basel III's capital and liquidity requirements affect emerging market banks' profitability. An analysis is conducted on banks that are subject to Basel III requirements and those that are not for the emerging market countries to determine how banks are affected, whether in a favourable or negative way.

1.4 Research Questions

- How do Basel III standards impact bank performance in emerging markets?
- How do banks that are subject to Basel III regulation and those that are not compare in terms of the effect of capital and liquidity on bank profitability?
- How do macroeconomic factors and bank-specific factors influence the profitability of banks in emerging markets?

1.5 Contribution of the study

According to Hohl et al. (2018), emerging markets and developing economies are implementing and modifying the Basel III requirements to enhance their banking infrastructure. Sabunwala (2012) asserts that when it comes to fortifying their banking systems, emerging market countries should prioritize different goals than developed economies. Because certain of these economies have underdeveloped financial markets and financial instability, regulatory reform and financial development are strongly intertwined in these markets. Burchi and Martelli (2016) suggest that this may have unforeseen

consequences when implementing Basel rules, especially as it is unclear which macro-prudential measures work best for emerging market nations. Fang et al. (2022) state that much of the research that is currently available on the effects of Basel III regulations focuses on advanced economies, mainly those in the United States and Europe.

It is, therefore, a plausible argument that rigorous studies regarding the effects of Basel III capital and liquidity requirements on banks' profitability in emerging markets are scarce and that the currently available data may not be entirely conclusive. Consequently, to determine how the Basel III regulation affects bank profitability for emerging markets in a way that goes beyond current theories, empirical research is essential. Thus, by demonstrating the relationship between Basel III standards and bank profitability in the context of emerging market banks, this study adds to the comparatively scarce body of empirical knowledge. The study considers both emerging market banks that are and those that are not subject to Basel III regulation, in contrast to previous research. In addition, in contrast to the preceding research, the study simultaneously examines the capital and liquidity requirements to draw a reliable conclusion about how both requirements affect bank profitability.

1.6 Significance of the study

The study contributes to comprehending and assessing the effects on the profitability of emerging market banks of the capital and liquidity regulations under the Basel III framework. Carletti et al. (2018) report that the Basel III framework-based regime has sparked discussions among scholars, policymakers, and other stakeholders on the connection and implications between these regulations and banks' financial performance. This paper explains how a given change can alter the bank's profitability and highlights the various ramifications for various stakeholders. The report provides regulators with a useful overview of the costs and potential advantages of implementing Basel III capital and liquidity requirements. To optimize the stability benefits for emerging market economies' financial systems, Beck, and Rojas-Suarez (2019) contend that the application of Basel standards application must be tailored to the specific conditions of these markets. This suggests the Basel framework should be appropriately calibrated and adjusted to the risks without impairing bank performance. As a result, the study illustrates how adaptation affects profitability growth.

According to Pham et al. (2022), banks with excessive capital and liquidity requirements contend and imperil their profitability. This could occur if banks' higher capital and liquidity holdings sharply increase the cost of funding for them. Increased funding costs could result in a reduced return on investment for banks, which would affect investors' value as shareholders. Investors can thus gain insight from this study into how Basel III regulations affect bank profitability and, consequently, their return on investment. The study expands on the literature on banking and finance in different dimensions for academicians. The paper explains the impact of bank regulation in the banking industry on a bank's profitability.

1.7 Limitations of the study

i. The study only focuses on listed banks in emerging market economies.
ii. There are limitations on data availability for the entire period of analysis for all listed banks in emerging market countries. Some banks are excluded for lack of data.
iii. The study may have overlooked other important variables that explain bank profitability because the study concentrated on a few specific measures and did not include all measures.
iv. Other measures of bank profitability, such as net interest margin and operating profit to risk-weighted assets, are ignored.

1.8 Outline of the study

The remainder of the paper is structured as follows: A review of the literature is presented in the next section. The data and methodology are explained in Section 3, and results and discussions are presented in Section 4. A conclusion is given in the last section.

2.0 Literature Review

According to Adelopo et al. (2021), different approaches have been employed in studies to examine the factors affecting bank profitability; some have concentrated just on the implications of Basel rules (Gavalas & Syriopoulos, 2014; Taskinsoy, 2018; Mashamba, 2018), while others have considered bank-related, industry-related, and macroeconomic variables (Saeed, 2014; San & Boon Heng, 2013). This study is concerned with how the Basel III capital and liquidity requirements affect banks' profitability in emerging market economies. Bank-specific and macroeconomic variables are considered control variables. This is due to the definition of the factors determining bank profitability as a function of internal and external determinants, as explained by Alper and Anbar (2011). The internal determinants are referred to as micro or bank-specific drivers of profitability and are associated with bank management (Gungor, 2007). Alper and Anbar (2011) assert that the external determinants reflect the economic and legal environment, which have an impact on the operation and performance of banks.

2.1 Theoretical background

2.1.1 Basel III regulatory reforms

Basel III is a regulatory measure taken in reaction to the causes and effects of the global financial crisis (Mahapatra, 2012). Several critical limitations were discovered in the prevailing banking supervisory framework of Basel II (Lan Le et al., 2020). Basel III was then implemented in 2010 to prevent the banking sector’s overall collapse and its knock-on effects on the real economy post the financial crisis (Mahapatra, 2012). According to BCBS (2011), the Basel III framework laid the groundwork for a robust banking system that supports the real economy throughout the economic cycle while preventing the development of systemic vulnerabilities. Basel III was intended to tighten banks' transparency and disclosures, improve risk management and governance, and increase their capacity to withstand shocks brought on by financial and economic stress from any source (Walker, 2011). According to BCBS (2011), the Basel III amendments focused on improving global capital and liquidity regulations.

2.1.2 Capital Regulations

a) Increasing the Quality and Quantity of Capital

The main goal of Basel III's capital reforms are to tighten the standards for banks' capital adequacy, including the quality and amount of capital they must have to cover losses in economic hardship (Shakdwipee & Mehta, 2017). According to King and Tarbert (2011), Basel III mandates that tier 1 capital make up at least 75 percent of a bank's total capital, and tier 2 capital is no more than 25 percent. In addition, Basel III divides Tier 1 into Common Equity Tier 1 and Additional Tier 1 categories. Common Equity Tier 1 capital is the highest quality of regulatory capital, as it promptly absorbs losses as they happen, while additional tier 1 capital is the regulatory capital that also offers loss absorption on a going-concern basis but consists of instruments that do not fully satisfy the requirements for common equity tier 1 capital (Financial Stability Institute [FSI], 2019).

Comparatively, tier 2 capital is regarded under Basel III as gone-concern capital and is meant to absorb losses to safeguard depositors in insolvency (McNamara et al., 2019). According to King and Tarbert (2011), tier 2 capital acts as a cushion and consists of junior liabilities and

lower forms of equity. These two components, tier 1 capital (comprising common equity tier 1 (CET1) and additional tier 1) and tier 2 capital, add up to the total amount of regulatory capital (FSI, 2019). Capital instruments must satisfy a certain set of requirements for each category before being included in that category. The minimum CET1, Tier 1, and bank capital requirements are determined as a percentage of risk-weighted assets at each level. To meet the minimum capital requirements, Johansson (2012) states that the total capital must be at least 8 percent, Tier 1 capital must be at least 6 percent, and the minimum amount of Tier 1 common equity must be 4.5 percent.

b) Establishing Additional Buffers

According to Sutorova and Teply (2014), two capital buffers are established under Basel III in addition to the mentioned minimum capital requirements. The first is the capital conservation buffer, which mandates that banks keep an extra 2.5 percent of total capital in the form of tier 1 common equity in addition to the 4.5 percent minimum already indicated (King & Tarbert, 2011). According to Goel and Kumar and (2013), the conservation buffer's purpose is to ensure that banks keep a cushion of capital that may be utilized to absorb losses during times of financial and economic hardship. Secondly, a countercyclical capital buffer of common equity tier 1 equivalent to 0 percent to 2.5 percent of risk-weighted assets is meant to safeguard the financial system from systemic risks brought on by unsustainable credit expansion (Nucu, 2011). According to Akter et al. (2019), a countercyclical buffer is used when it is determined that credit growth would cause an unbearable accumulation of systemic risk.

c) Leverage Ratio

A further Basel III regulation is the leverage ratio, which places a limit on the amount of leverage a bank can have concerning the size of its balance sheets (Lee, 2014). Mahapatra (2012) asserts that the leverage ratio has micro- and macro-prudential components. As a complement to the risk-based capital ratios, King and Tarbert (2011) claim that it limits excessive risk at the micro level. On the other hand, according to Nucu (2011), the ratio's macro prudential goal is to strengthen resilience to crisis conditions and decrease the likelihood of systemic risk manifestation. It also guards against the paradoxical incentive to accumulate low-risk assets, which can cease to be such in the face of extraordinary circumstances that raise systemic risk (Mahapatra, 2012). According to McNamara et al. (2019), Basel III defines a leverage ratio that mandates banks maintain Tier 1 capital at least 3% of total exposure.

2.1.3 Liquidity Regulations

a) Liquidity Coverage Ratio

According to King and Tarbert (2011), the Liquidity Coverage Ratio (LCR) is intended to make sure that a globally active bank has enough unencumbered, high quality liquid assets to cover potential net cash outflows under a month-long acute stress scenario that includes both systemic and institution-specific shocks. The LCR is determined, in accordance with Bwacha and Xi (2018), by dividing the value of a bank's stock of unencumbered high-quality liquid assets by the value of the total net cash withdrawals from the bank anticipated to take place over the following 30 calendar days under stressed conditions. This 30-day threshold is based on the idea that bank management and regulators will have had enough time to act by the end of the stress scenario, whether through central bank intervention, management, regulator-led remedial measures, or an orderly resolution (McNamara et al., 2019).

According to Gomes and Wilkins (2013), the definition of high-quality liquid assets and the calibration of the metrics relating to money inflows and outflows significantly impact how well

the LCR accomplishes its stated goal. According to BCBS (2011), high-quality liquid assets must typically be quickly and readily converted into cash with little to no value loss. According to Buková and Reuse (2011), the assets must have low credit and market risk, be listed on a mature and reputable exchange market, or have a low connection with hazardous assets. Additionally, the market where the asset is exchanged should have certain qualities, such as minimal market concentration, an active and sizeable market, and so on. The assets must not be encumbered, which means they cannot be used to guarantee, collateralize, or enhance credit in any transaction. According to BCBS (2019), high-quality liquid assets may be divided into two categories. Level 1 assets are the first category, which comprises cash, reserves held by central banks, and alternatives to cash, such as highly rated sovereign debt.

Higher-rated covered bonds, non-financial corporate bonds, and lower-rated governmental debt are all considered Level 2 assets. A minimum haircut of 15% is applied to these assets, which are limited to 40% of the entire pool of liquid assets (Gomes & Khan, 2011). According to the specified stress scenario for the following 30 calendar days, the total predicted cash outflows minus the total expected cash inflows is the denominator of the LCR (BCBS, 2019). Outstanding balances are multiplied by the stress mentioned above outflow and inflow rates to arrive at these numbers, with total projected cash inflows being computed up to a combined maximum of 75% of total expected cash outflows (Gomes & Wilkins, 2013). Outflows are computed for these components using run-off assumptions based on the kind of bank liabilities. According to King and Tarbert (2011), the resultant net cash outflow is equal to the minimal level of high-quality liquid assets that banks must maintain under Basel III's LCR.

b) Net Stable Funding Ratio

According to Giordana and Schumacher (2017), a measure of maturity mismatch risk designed to encourage increased medium and long-term financing of a bank’s assets is called the Net Stable Funding Ratio (NSFR). By encouraging improved management of liquidity risk from off-balance sheet exposures, the NSFR seeks to lessen reliance on wholesale short-term finance (Gomes & Wilkins, 2013). According to Jayadev (2013), the NSFR calls for a bank to have a minimum number of stable funding sources concerning the assets' liquidity profiles and any potential future demands for liquidity stemming from off-balance sheet obligations over a one-year horizon. According to Bwacha and Xi (2018), the net stable funding ratio is a ratio of available stable funding concerning the amount of required stable funding. The NSFR requires that, on an ongoing basis, the ratio of available stable funding (ASF) to required stable funding (RSF) be at least 100% (McNamara et al., 2019).

The total amount of a bank's regulatory capital, along with preferred stock and liabilities with maturities of a year or more, and the portion of non-maturity deposits, term deposits, and wholesale funding with maturities of less than a year that would be anticipated to remain with the institution for an extended period in an idiosyncratic stress event are all considered available stable funding (King & Tarbert, 2011). Off-balance-sheet exposures and other activities are added to unencumbered assets to determine the required stable funding. Items relevant to the necessary stable funding are given a factor that is inversely linked to their estimated market liquidity, meaning that the less stable funding is required, the more liquid the asset (Gomes & Wilkins, 2013).

2.1.4 How relevant are the Basel III requirements for Emerging Markets Economies

The main goal of regulatory changes is to make banking systems more resilient to systemic shocks. However, Basel III requirements were primarily created with advanced financial markets and their crisis experience in mind (Ferreira et al., 2019). However, emerging markets and other developing economies have also been impacted by the crisis's macroeconomic effects through different channels. According to Ozkan and Unsal (2012), the channels through which the global financial shocks were propagated to emerging markets were through financial spillovers and the export channel. These effects have made the significance of stable financial systems for emerging markets even more apparent (Beck & Rojas-Suarez, 2019). Therefore, according to Beck and Rojas-Suarez (2019), emerging markets need efficient and secure financial systems to achieve long-term balanced development and absorb different kinds of shocks.

However, the Basel III regulation and its impact on the cost of financial intermediation is under severe debate (Zheng et al., 2017). While the Basel III standards were designed to provide more stable and effective capital and liquidity structures in banking, it is possible that they could also cause the creation of new issues (Golubeva et al., 2019). According to Berka and Zimmermann (2018), the modifications to the Basel regulations may have an impact on economic activity by raising the cost of financial intermediation. As a result, Basel III compliance may harm bank performance, including decreased profitability and pressure on lending margins (Golubeva et al., 2019). Commercial banks' primary objectives are to maximize profits and operate profitably, two factors that should be considered when assessing how regulations affect business (Grzeta et al., 2023).

2.2 Empirical Evidence

2.2.1 Basel III determinants of bank profitability

a) Capital

The capital's primary purposes are to serve as a loss-absorbing buffer, to boost depositor confidence, and to reveal the level of risk that bank owners are willing to take (Ayaydin & Karakaya, 2014). The link between a bank's financial performance and its minimum capital requirement is of ongoing importance since it affects how profitable a bank may be (Christian et al., 2008). Researchers have looked at the connection between bank capital and profitability, with various degrees of success. Deli and Hasan (2017) claim that capital may counteract the negative impacts of regulation and is one of the main predictors of bank performance. They conclude that when banks have adequate capital levels, tight capital regulation minimally impacts lending growth. They also discover that Basel standards' capital requirements, particularly when put in place during periods of typical economic growth, are relatively doable for banks with enough capital.

Empirical data from several research demonstrates that a greater capital need may contribute to increased profitability. Capraru and Ihnatov (2015) examine the key factors influencing bank profitability in Central and Eastern European countries and find that greater capital adequacy is associated with greater bank profitability. The same is concluded by Bouheni et al. (2014) and Neyapti and Dincer (2014) demonstrating how regulation and supervision increase bank profitability. Higher capital requirements may result in well capitalized banks paying less for insurance on various types of uninsured debt, according to Lee and Hsieh

(2013). Additionally, according to Berger (1995), expected bankruptcy costs of sound capitalized companies decline, which lowers borrowing costs and eventually raises profitability. According to Petria et al. (2015) research, a high capital adequacy ratio can be associated with profitability since the bank is taking fewer risks. Mashamba (2018) concurs that banks with high capital have lower risks, improving their stability rankings and ability to source more money at cheaper prices, increasing profitability.

The Basel III capital ratio and bank operational efficiency have a favourable and substantial link, according to Lotto (2019) research in Tanzania. This revealed that Tanzanian commercial banks with stricter capital requirements were more productive overall. The relationship also demonstrated that adequate capital increased the bank's operational efficiency and strengthened financial stability by supplying a greater capital buffer. Chortareas et al. (2012) concluded that raising capital requirements enhanced the operational efficiency of the banks after applying the Basel III capital regulatory framework to study the impact of capital requirements on commercial bank operating efficiency in 22 European Union nations. Similarly, Barth et al. (2013) found that banks from countries with stricter capital requirements and adherence to Basel III were more effectively run than those from countries with laxer bank capital regulations. This was in line with a global study of 72 countries on the influence of bank supervision, regulation, and monitoring on operating efficiency.

On the contrary, some other studies either find negative or mixed results. Le et al. (2023) looked at the connection between Basel III capital ratios and bank efficiency as assessed by earnings before interest and tax (EBIT), return on assets (ROA), and return on equity (ROE). The study's findings demonstrate a positive impact of capital on bank performance as assessed by EBIT but a negative impact on bank profitability as evaluated by ROE and ROA. According to Ozili (2017) analysis of a sample of African banks, regulatory capital significantly affects the earnings of listed banks. However, greater regulatory capital requirements harm the profits of non-listed banks.

Higher capital regulatory requirements were shown to negatively correlate with banks' efficiency in Berger and Di Patti (2006) study on the impact of bank regulations on profitability and effectiveness. They said that because of this unfavourable consequence, banks with bigger capital reserves had less cash available to investigate potential future investment possibilities, which decreased their revenue and profits and ultimately resulted in lower operational and investment efficiency. According to Chiaramonte and Casu (2017) argument, banks' efficiency is subsequently harmed because of their reduced investment and lending to fulfil the minimum capital requirements.

According to other bodies of the empirical literature, the Basel III capital adequacy ratio has a negligible effect on the operating results of banks in developed nations. According to Bandt et al. (2018), the Basel III capital ratio has little effect on French banks' efficiency. According to Buchory (2015) research, bank capital, as measured by the capital adequacy ratio, is negatively correlated with profitability for Indonesian banks. They explain this finding by the decline in bank lending. Furthermore, according to Swamy (2014), raising the capital ratio results in higher finance costs. Anbar and Alper's (2011) research also demonstrated a negative impact of capital adequacy on return on equity. According to

Chiaramonte and Casu (2017), banks' efficiency suffers because they must invest and lend less to achieve minimum capital requirements, which hurts their financial performance.

Given the above arguments, the first null hypothesis is that:

H1: The Basel III capital standards do not impact bank profitability in emerging markets.

b) Liquidity

Liquidity risk is one of the key risk types that concern banks, according to the BCBS (2013). When a bank is unable to quickly convert assets into cash or increase its liabilities at a reasonable cost, liquidity risk manifests, which negatively impacts the bank's profitability (Altahtamouni & Alyousef, 2021). According to Golubeva et al. (2019), the financial system's stability is improved by a healthy and profitable banking industry. Dietrich and Wanzenried (2011) emphasized the value of profitability and proposed using this idea as a gauge for a bank's management effectiveness. A significant corpus of research has focused on the connection between the functions of liquidity and profitability in the banking industry, with a range of findings (Golubeva et al., 2019).

By adopting the new guidelines for managing and monitoring liquidity risk, Basel III strongly emphasized liquidity. Liquidity is the capacity to obtain the required funds through attracting deposits, cash, or pledging encumbered assets (Soprano, 2015). According to Yusuf et al. (2019), bank liquidity refers to the ability to quickly convert assets into cash. Liquidity is the capacity of banks to ensure that account holders may quickly access their funds at any moment (Alali, 2019), as well as the assurance that banks provide that all necessary financial commitments can be met through holding a significant amount of liquid assets (Davies, 2014). According to Adalsteinsson (2014), there are three main ways to obtain liquidity: selling assets is one, borrowing money from creditors on the financial markets is another, and the third relies on debtors paying back their obligations. From a micro perspective, liquidity regulations prevent bank failure and harm to depositor interests by regulating the liquidity buffer of banks, and from a macro perspective, liquidity regulations support the maintenance of financial system stability (Rochet, 2008).

Mashamba (2018) looked at the impact of Basel III's new LCR on the profitability of banks in developing market economies. The return on assets (ROA) for profitability was the dependent variable, while the LCR and other control factors were the primary independent variable. The empirical findings demonstrated that the LCR helped banks in emerging economies by increasing their profitability. In addition to various microeconomic and macroeconomic variables, Yaacob et al. (2016) study looked at the NSFR and LCR as indicators of liquidity risk drivers. An internal metric to assess profitability was the ROA. The regression's findings indicated that the liquidity risk positively impacted funding. As such, an increase in funding tends to raise the exposure to liquidity risk, which might impact bank performance by raising the chance of bankruptcy. Yaacob et al. (2016) concluded that the profitability brought on by reducing liquidity shocks may thus benefit from an improvement in Basel III liquidity ratios.

Dietrich et al. (2014) investigated the effects of the NSFR under Basel III on the efficiency of Western European banks. Indicators of profitability such as return on assets (ROA), return on equity (ROE), and net interest margin (NIM) were utilized in addition to explanatory and macroeconomic factors. The results showed that the NSFR for banks usually declined before

the global financial crisis 2008. Furthermore, the findings on the impact of the NSFR on banks' profitability demonstrated that banks with a low NSFR performed more erratically. As a result, it can be inferred that using the new liquidity indicators tends to make banks more reliable and stronger (Dietrich et al., 2014). The NSFR influence on the profitability of Malaysian commercial banks was examined by Said (2018), who concluded that banks were able to retain their profitable performance even while moving to hold high-quality liquid assets, supporting the aforementioned findings.

Following the new Basel III liquidity and capital rules, Yan et al. (2012) conducted a long-term cost-benefit analysis for the UK in their article. The NSFR was considered a liquidity indicator. The empirical findings indicated that the Basel III framework had a sizable beneficial impact on the UK economy, and it was probable that the impact would grow after the liquidity regulations were satisfied and implemented. Furthermore, the results demonstrated that these liquidity regulations considerably impacted the mitigation of financial crises and boosted financial stability. In ROA and NIM profitability measuring models by San and Heng (2013), liquidity was also discovered to be a driver of profitability. The implication was that liquidity improves the profitability performance of banks. According to San and Heng (2013), banks with enough liquid assets reduce their chance of going bankrupt because they can handle financial risk. They also highlighted that they could cut the cost of borrowing from external sources, which boosts profitability.

Roulet (2018) examined how bank lending changed in response to Basel III's new liquidity and capital framework. Loans were thought to be the main driver of a bank's profitability. In the study, the NSFR was considered as a liquidity indicator. It was discovered that the Basel III liquidity rules had an impact on the traits and behavior of the banks in both good and negative ways, and following the increased liquidity rules, European banks were under pressure to reduce their growth in lending and boost their level of liquid assets. The profitability of banks in Luxembourg under the Basel III liquidity and capital framework was investigated by Giordana and Schumacher (2017). The study looked at how the LCR and NSFR affected bank profitability and default risk. The results showed that the increased liquidity criteria helped to reduce the likelihood of default.

Banerjee and Mio (2018) utilized the individual liquidity guideline (ILG) as a liquidity measure that was comparable in design and computation to the LCR suggested by the BCBS to empirically evaluate the effect of the stricter liquidity regulation on banks' performance in the United Kingdom (UK). The findings demonstrated no proof that the introduction of the ILG harmed the banks' lending activities. However, banks' profitability decreased once the ILG was implemented because of moving to hold low-yield liquid assets. Härle et al. (2010) used a sample of banks from the US and Europe to find that the new liquidity requirements caused the banks' Returns on Equity (ROE) ratio to decline. Additionally, Saif-Alyousfi et al. (2017) used several criteria to assess the profitability of Saudi commercial banks. More specifically, the profitability indicators were the dependent variables. At the same time, the ratios of net loans to total deposits and liquid assets to total assets were utilized to calculate the liquidity risk. The findings showed that the domestic banks' liquid assets to total assets ratio had a negative impact on return on equity and net interest margin.

According to Ayaydin and Karakaya (2014), liquidity and net interest margin have a negative relationship. According to a different study by Tran et al. (2016), profitability and liquidity

are inversely related, with an increase in liquidity resulting in decreased profits realized. Additionally, Molyneux and Thornton (1992) demonstrated a negative link between profitability and liquidity. According to Adelopo et al. (2021), there are statistically significant variations between all the profitability dimensions used in the study, namely return on assets, return on equity, and operating profit to risk-weighted assets, for the observed variables on liquidity serving as predictors of profitability. As a result, it is said that when formulating strategies aimed at boosting profitability, liquidity still represents a crucial indicator that requires careful consideration. On the other hand, Molefe and Muzindutsi (2016) analyzed the effect of capital and liquidity management on profitability for leading South African banks, and the empirical findings showed no long and short-term relationship between banks' profitability and liquidity management.

Assuming the above reasoning, the second null hypothesis is that:

H2: Bank profitability in emerging markets is unaffected by Basel III liquidity regulations.

2.2.2 Bank-specific determinants of bank profitability

Other elements that impact bank profitability have been discovered in the literature. According to Mamatzakis and Remoundos (2003), factors directly related to the bank's strategic planning are crucial in determining why the bank is profitable. Such elements are thought to be bank-specific elements.

a) Bank Size

It is typical to anticipate a positive impact of bank size on profitability (Smirlock, 1985). According to Mbekomize and Mapharing (2017), larger banks often have greater reported returns on assets and equity. Some research (Anbar & Alper, 2011; Kosmidou et al., 2006; Kosmidou et al., 2005 Tariq et al., 2014) have found a strong and positive association between the size and profitability of commercial banks. The underlying assumption was that larger banks are more likely to have loan diversification than smaller banks, mostly due to the economies of scale. Bourke (1989) study noted a positive and statistically significant association between bank size and profitability. According to the study, an increase in size frequently leads to a rise in profitability. However, some academics have discovered an inverse relationship between profitability and bank size, such as Dietrich and Wanzenried (2011). They discovered that the primary cause of the negative association was the significant losses large banks suffered because of numerous unrecoverable loans.

Similarly, the studies by Stiroh and Rumble (2006) and Pasiouras and Kosmidou (2007) place the blame for the inverse link between bank size and profitability on agency fees, additional expenditures associated with large businesses, and administrative overhead. Ben Naceur and Goaied (2008) and Sufian and Habibullah (2009) further support the idea that there is a negative relationship between bank size and profitability. A substantial inverse relationship between bank size and profitability was also shown by Kosmidou et al. (2005), suggesting that larger banks often produce smaller margins and profits. However, several research (Athanasoglou et al., 2008; Goddard et al., 2004) also claim that bank size has no impact on bank profitability. Although the relationship between bank size and bank profitability remains inconclusive from the above findings, we anticipate that bank size will positively impact bank profitability.

b) Cost efficiency

A significant and ongoing potential for increasing profitability is provided by expense control (Staikouras, 2004). San and Hen (2013) claim that the cost-to-income ratio measures how well costs are controlled, while Hussain (2014) claims that cost-to-income is one of the important indicators taken into consideration when talking about bank productivity and efficiency even though cost-to-income ratio issues have been identified by Welch (2006). According to Welch (2006), the cost-to-income ratio is the ratio of a bank's costs to earnings. The return on assets, a proxy for bank performance, is negatively impacted by the cost-to-income ratio, according to research by Bywalec et al. (2020) on the evaluation of Ukrainian banks' efficacy. This finding is consistent with research by Hess and Francis (2004), who connected banks' net earnings to a low cost-to-income ratio, and Syafri et al. (2012), who found a negative impact of the cost-to-income ratio on the profitability of Indonesian banks.

Following San and Heng (2013), the cost to income ratio has a negative and significant link with profits. Furthermore, Almazari (2013) discovered a negative impact of the cost-to-income ratio on return on assets for Saudi Arabian banks. Likewise, Ahmad and Matemilola (2013) research revealed that Saudi banks' capacity to profit from their operations is hampered by their cost-to-income ratio. The performance of banks is negatively impacted by the cost-to-income ratio, according to Kosmidou et al. (2006). Poor spending management was identified as one of the key causes of low profitability by Guru et al. (2002) and Kosmidou et al. (2006). According to the findings, inadequate resource management significantly contributes to low profits (Sufian & Chong, 2008). An efficient bank can function with a lower cost-to-income ratio and generate more profit. The cost-to-income ratio generally appears to have a negative impact on bank profitability.

c) Credit quality

According to Nisar et al. (2015), credit quality is one of the most important indicators of the financial health of the banking sector and is closely related to profitability. According to Jigeer and Koroleva (2023), non-performing loans and loan loss provisions are the fundamental notions of credit quality (or loan quality). The non-performing loan ratio exhibits subpar asset quality and ineffective credit management, which are strongly related to low profitability (Noman et al., 2015; Fu, 2020). However, Qu (2007) discovered that the non-performing loan ratio does not affect profitability. According to empirical data, there may or may not be a relationship between profitability and the loan loss provision ratio since, on the one hand, obtaining more loans may result in higher interest rates, which boost profits. On the other hand, larger loan loss provisions brought on by increasing lending and high default probabilities may result in decreased revenues (Noman et al., 2015). Additionally, according to Athanasoglou et al. (2008), a bank's profitability will suffer because of a bigger loan loss provision.

2.2.3 External determinants of bank profitability

The most frequent external elements that affect the performance and operation of the bank, according to Mbekomize and Mapharing (2017), are GDP growth, inflation, and interest rate. These external factors are related to the economic environment.

a) GDP growth

According to Rahman et al. (2015), the GDP growth rate indicates a country's overall economic development and significantly impacts banks' financial performance. The GDP growth variable has a favorable effect on bank profitability according to research by Anbar and Alper (2011). Similar findings are reported in Sufian and Chong (2008) investigation. Other research, such as those by Petria et al. (2015), Ozili (2017), Hassan and Bashir (2003), and Pasiouras and Kosmidou (2007), also discovered a significant and positive association between GDP growth and profitability. For example, when the economy is struggling, the volume of loans and deposits drops, which lowers bank profitability. The likelihood of defaulting on bank loans decreases during economic expansions because borrowers are in a better financial situation and can pay their creditors when their loan instalments are due, whereas, during recessions, borrowers find it challenging to fulfil their debt obligations.

On the other hand, Khrawish (2011) study on the Jordanian banking industry does not corroborate the positive relationship between GDP growth and bank profitability findings. The study's findings suggest a negative relationship between GDP growth and bank profitability. Similar findings are made in the study Sastrosuwito and Suzuki (2012) conducted on the Indonesian banking sector, which reveals a negative relationship between bank profitability and GDP growth. Additionally, Satria et al. (2018) show a negative impact of GDP growth on bank profitability when examining the factors affecting bank profitability in major Asian commercial banks. In general, we anticipate a positive impact of GDP growth on bank profitability.

b) Inflation

According to San and Heng (2013), inflation is the rate at which the overall level of prices for goods and services are rising in the economy over time. Adelopo (2021) asserts that the relationship between inflation rate and bank profitability depends on the ability to foresee changes in inflation rates accurately since doing so would allow banks to appropriately adjust their interest rates based on the specific calculation of the rate. Similarly, Pasiouras and Kosmidou (2007) noted banks' profitability may be impacted by inflation in either a good or negative way. If the pace of inflation is projected, banks can promptly change interest rates. Because of this, the revenues grow more quickly than the costs do, which positively affects profitability.

On the other hand, if the inflation rate is unanticipated, banks are unable to alter interest rates promptly, and the expense will exceed the income. Profitability will be negatively affected by this. In a similar vein, Bourke (1989) claims that the relationship between inflation and profitability is significantly influenced by banks' capacity to predict the course of inflation, with the failure to do so sometimes leading to an inverse relationship. Tariq et al. (2014) add that rising inflation has an adverse impact on bank profitability since it drives up costs, which lowers profit. We expect the inflation rate to be negatively correlated with bank profitability.

c) Interest rate

According to empirical research, interest rates positively and statistically significantly impact bank profitability. The results of Aburime (2009) examination into the impact of macroeconomic factors on Nigeria's banking industry show that interest rates have a major impact on bank profitability. The coefficient data likewise show a positive impact on profitability. Pasiouras and Kosmidou (2007) and Sufian et al. (2008) are two further studies

that demonstrate a positive impact. Additionally, Staikouras and Wood (2011) found that the level of interest rates had a considerable favorable impact on profitability. Similarly, Anbar and Alper (2011) discovered that only the real interest rate was important among the macroeconomic factors of GDP growth and inflation and concluded that higher real interest rates could result in increased bank profitability due to higher rates of return on assets like loans. We expect the interest rate to be positively correlated with bank profitability.

2.3 Literature Review Summary

Summing up the literature review, different econometric estimation results yield different outcomes in explaining the impact of Basel III capital and liquidity requirements on bank profitability. In this review, the results of key profitability determinant variables are mixed. Some of the research mentioned above pointed out that the liquidity standard would have a negative impact on profitability because of the retention of higher quality liquid assets, which generally have lower returns. Others, however, indicated that with the introduction of higher liquidity requirements, banks would maintain higher liquidity buffers, minimizing the possibility of liquidity crises and instead enhance financial stability and profitability. Therefore, the inconsistency opens up the possibility of further investigations to understand the impact of these regulations on bank profitability. Thus, the motive of this study is to analyse the impact of Basel III capital and liquidity requirements on bank profitability in emerging markets and, thereby, make a significant contribution to the studies of bank regulation on bank profitability in the context of emerging markets.

3.0 Methodology

3.1 Data

Our sample spans 2012 to 2022 and consists of 128 banks from emerging market countries. Two subsamples are extracted from the sample. Among the subsample nations that have adopted Basel III according to the Basel Committee on Banking Supervision (2023) are Brazil, the Czech Republic, Egypt, Hungary, Indonesia, South Korea, Mexico, Pakistan, Philippines, Poland, Russia, Saudi Arabia, South Africa, and Thailand. The other countries that have not ratified Basel III, making the other subsample, are Chile, China, Colombia, India, Kenya, Malaysia, Nigeria, and Turkey. Of the sample, 65 banks subject to Basel III account for 50.78%, while 63 banks not subject to Basel III account for 49.22%. Based on data availability, study focuses on the listed banks in emerging market countries. Only listed banks were considered to minimize data constraints. We removed banks with incomplete data from our sample, and only banks with complete data available were chosen. The Eikon Reuters database is the source of the specific bank accounting data. The macroeconomic data utilized in the study was sourced from the World Bank database.

Table 1 Sample

Sample	**Countries**	**Number of Banks**	**Percentage**
Basel III	Brazil	4	3.13%
	Czech Republic	1	0.78%
	Egypt	6	4.69%
	Hungary	1	0.78%
	Indonesia	11	8.59%
	South Korea	4	3.13%
	Mexico	1	0.78%
	Pakistan	3	2.34%
	Philippines	6	4.69%
	Poland	7	5.47%
	Russia	1	0.78%
	Saudi Arabia	10	7.81%
	South Africa	5	3.91%
	Thailand	5	3.91%
Non-Basel III	Chile	2	1.56%
	China	16	12.50%
	Colombia	2	1.56%
	India	10	7.81%
	Kenya	8	6.25%
	Malaysia	9	7.03%
	Nigeria	9	7.03%
	Turkey	7	5.47%
	Total	**128**	**100.00%**

3.2 Methodology

The econometric method employed in this study is dynamic panel data. Panel data is a collection of information gathered through observation of cross-sectional variables across time (Ahn & Moon, 2014). Hadush et al. (2023) explain that the panel data set is comprised of time series and cross-sectional dimensions. Observing the same cross-section units over a specified length of time forms the time series' size (Wooldridge, 2009). Panel data offer greater efficiency, reduced collinearity between the variables, the possibility to examine variability in adjustment processes between various observations, more degrees of freedom, and more useful data (Baltagi & Pirotte, 2010). Regression and time-series analysis are two approaches that can be combined to analyze panel data (Frees, 2004). Effects that are not visible in pure cross-section or time-series data can be more accurately detected and measured by examining the repeated cross-section of observation panel data (Gujarati, 2009).

According to Lee and Yu (2010), panel data allows researchers to regulate unobservable heterogeneity among units and capture economic activity dynamics. Pure time series or cross-sectional research may yield biased results if this heterogeneity is not taken into account (Hadush et al., 2023). Panel data can account for subject- or time-invariant characteristics (Baltagi & Pirotte, 2010). Since panel data includes time-based dynamics and cross-sectional data observations are repeated across time, the impact of unmeasured variables can be controlled (Hsiao, 2003). Furthermore, Hsiao (2023) explained that when cross-sectional observations are employed across time, panel data analysis gives more clarity, more degrees of freedom, less collinearity, and efficiency compared to just cross-sectional or time-series analysis.

According to Gunawan et al. (2023), panel data's dynamic nature suggests that, in addition to the immediate and long-term impacts of economic growth, the value of one variable may be influenced by the values of other variables and the variable in question during the previous period. The lagged value of the dependent variable was utilized as one of the explanatory variables to bring the effect of dynamism into the model, allowing for a partial adjustment toward long-run equilibrium (Baltagi et al., 2008). A lagged dependent variable in a regression is commonly used to remove autocorrelation from the model and capture dynamic impacts, according to Keele and Kelly (2006). The following is the simple specification of the empirical model to be estimated;

$$\begin{aligned} \mathrm{Prof}_{nt} = {} & C + \delta \mathrm{Prof}_{nt-1} + \beta_1 \mathrm{CAP}_{nt} + \beta_2 \mathrm{LIQ1}_{nt} + \beta_3 \mathrm{LIQ2}_{nt} + \beta_4 \mathrm{BS}_{nt} + \beta_5 \mathrm{CTI}_{nt} \\ & + \beta_6 \mathrm{NPL}_{nt} + \beta_7 \mathrm{LLP}_{nt} + \beta_8 g_t + \beta_9 \pi_t + \beta_{10} r_t + d_t + \varepsilon_{nt} \end{aligned} \quad \textbf{(1)}$$

In equation (1) above, the variables are explained as per the below table:

Table 2 Variables

Variable	Description	Measure
$Prof_{nt}$	Profitability for bank n, at time period t	ROA: Net Income/ Total Assets ROE: Net Income/ Total Equity
$Prof_{nt-1}$	Profitability for bank n, at time period t-1	ROA t-1 ROE t-1
C	Constant coefficient	n/a
δ	Speed of adjustment	n/a
β_k:	Coefficients to be estimated that explain the extent of influence of the change in the explanatory variable to the dependent variable	n/a
CAP	Capital stock for bank n, at time period t	Total Equity/Risk Weighted Assets
LIQ1	Liquidity stock for bank n, at time period t	Total Loans/ Total Customer Deposits
LIQ2	Liquidity stock for bank n, at time period t	Total Customer Deposits/ Total Funding
BS	Bank size for bank n, at time period t	Ln Total Assets
CTI	Cost to income ratio for bank n, at time period t	Total cost less interest expense/Total income
NPL	Non-performing loans ratio for bank n, at time period t	Non-Performing Loans/Gross Loans
LLP	Loan loss provision ratio for bank n, at time period t	Loan Loss Provision/Total Loans
G	Country Growth rate (GDP) at time period t	GDP growth of a country
Π	Annual Inflation rate at time period t	Consumer Price Index
R	Interest rate at time period t	Lending Interest Rate
d	year dummy at time period t	n/a
ε_{nt}	Idiosyncratic error term for bank n, at time period t	n/a

The data analysis technique employed is the econometric models of the panel dynamic generalized method of moments (GMM). Beyene (2022) asserts that GMM is better than fixed effect and random effect models because it can capture endogeneity in regressors and unobserved heterogeneities unique to a certain country. The GMM also handles concerns with reverse causality, omitted variables, measurement errors, and simultaneity bias. The difference between GMM and system GMM are the two types of GMM estimators. The

difference GMM estimator of Arellano and Bond (1991), according to Messai et al. (2015), entails instrumenting the explanatory variables of the first difference equation using values that are at least one period behind. Therefore, the model specification to be estimated becomes as follows:

$$\Delta Prof_{nt} = \delta\Delta Prof_{nt-1} + \beta_1\Delta CAP_{nt} + \beta_2\Delta LIQ1_{nt} + \beta_3\Delta LIQ2_{nt} + \beta_4\Delta BS_{nt} + \beta_5\Delta CTI_{nt} + \beta_6\Delta NPL_{nt} + \beta_7\Delta LLP_{nt} + \beta_8\Delta g_t + \beta_9\Delta\pi_t + \beta_{10}\Delta r_t + \Delta d_t + \Delta\varepsilon_{nt} \quad \textbf{(2)}$$

Arellano and Bond (1991) originally employed the first difference equation to address the country-specific effect. However, using the dependent variable's first difference as a regressor, also produced another endogeneity bias. Poor instruments used in the different GMM approaches can occasionally lead to skewed coefficients in finite samples, according to Zarra-Nezhad et al. (2014). However, Blundell and Bond (1998) suggested a system based GMM estimator because the first difference GMM has weak instruments because of the high data persistence due to differencing. Using an equation at the level where the variables are instrumented by their first difference, Blundell and Bond (1998) suggested that System GMM integrates the first difference between two equations. This is preferred because it is thought to be much better in that it is more suitable for handling concerns with endogeneity, unobserved effects, and weak instruments (Beyene, 2022). According to Arellano and Bover (1995) and Blundell and Bond (1998) system, GMM builds a system of two equations: the original equation and the transformed one;

$$\begin{cases} \Delta Prof_{nt} = \delta\Delta Prof_{nt-1} + \beta_1\Delta CAP_{nt} + \beta_2\Delta LIQ1_{nt} + \beta_3\Delta LIQ2_{nt} + \beta_4\Delta BS_{nt} + \beta_5\Delta CTI_{nt} + \beta_6\Delta NPL_{nt} + \beta_7\Delta LLP_{nt} + \beta_8\Delta g_t + \beta_9\Delta\pi_t + \beta_{10}\Delta r_t + \Delta d_t + \Delta\varepsilon_{nt} \\ Prof_{nt} = C + \delta Prof_{nt-1} + \beta_1 CAP_{nt} + \beta_2 LIQ1_{nt} + \beta_3 LIQ2_{nt} + \beta_4 BS_{nt} + \beta_5 CTI_{nt} + \beta_6 NPL_{nt} + \beta_7 LLP_{nt} + \beta_8 g_t + \beta_9\pi_t + \beta_{10} r_t + d_t + \varepsilon_{nt} \end{cases} \quad \textbf{(3)}$$

According to Arellano and Bover (1995) and Blundell and Bond (1998), the GMM uses orthogonal deviations instead of subtracting the previous observation from the contemporaneous one, subtracting the average of all future available observations of a variable. This means that, regardless of the number of gaps in the data, it may be computed for every observation except the last for each individual, minimizing data loss. According to Messai et al. (2015), the validity of the instruments matrix and the presumption that there is no residual autocorrelation are two factors that have a major impact on the system GMM estimators' quality. They further explained that two tests are usually used. The first test states that the instrument matrix should not relate to the disturbance. The Hansen J test and Sargan test are used to assess this proposition. They test the null hypotheses of the overall validity of the instruments used. Failure to reject these null hypotheses gives support to the choice of the instruments.

The second diagnostics test is for autocorrelation or serial correlation of the error term. It tests the null hypothesis that the differenced error term is first, and second order serially correlated. Failure to reject the null hypothesis of no second-order serial correlation implies that the original error term is serially uncorrelated, and the moment conditions are correctly specified (i.e., the value of AR (2) > 0.05).

Zarra-Nezhad et al. (2014) explain that it is critical to check for autocorrelation. They clarified that if the errors were serially correlated, an estimator based on the assumption of white noise errors would not be consistent. The Arellano and Bond (1991) GMM estimator requires no second-order serial correlation in the error term of the first-differenced equation. According to Zarra-Nezhad et al. (2014) the instruments are invalid if this requirement is not met, i.e., if the differenced error terms exhibit second-order serial correlation.

4.0 Results

4.1 Descriptive Analysis

According to descriptive statistics, non-Basel III countries have an average ROE higher than Basel III nations. For the ROA variable, the levels are the same for Basel and Non-Basel countries. Basel III countries maintained better levels of capital and liquidity than non-Basel III countries between 2012 and 2022. Basel III countries have an average bank liquidity level of 24.6%, whilst non-Basel III countries have an average bank liquidity level of 23.4%. Moreover, the average capital of Basel III countries is 18.2%, compared to 15.3% for non-Basel III countries.

Table 3 Summary Statistics

Sample	Variable	Mean	Std. dev.	Min	Max
Overall Sample	ROE	0.152	0.102	-1.900	1.060
	ROA	0.017	0.012	-0.061	0.072
	CAP	0.168	0.062	0.000	1.093
	LIQ1	0.803	0.225	0.044	2.213
	LIQ2	0.818	0.130	0.212	0.978
	BS	0.245	0.018	0.200	0.294
	CTI	0.532	0.151	0.131	2.163
	NPL	0.046	0.066	0.000	1.650
	LLP	0.014	0.022	-0.023	0.478
	g	0.040	0.032	-0.095	0.117
	π	0.054	0.065	-0.021	0.723
	r	0.095	0.073	0.010	0.521
Basel III Countries	ROE	0.143	0.113	-1.900	0.389
	ROA	0.017	0.012	-0.061	0.072
	CAP	0.182	0.051	0.000	0.384
	LIQ1	0.826	0.237	0.280	2.213
	LIQ2	0.818	0.153	0.212	0.978
	BS	0.243	0.013	0.210	0.271
	CTI	0.554	0.163	0.249	2.163
	NPL	0.050	0.051	0.003	0.726
	LLP	0.015	0.026	-0.012	0.478
	g	0.032	0.031	-0.095	0.087
	π	0.043	0.042	-0.021	0.295
	r	0.088	0.086	0.010	0.521
	ROE	0.161	0.088	-0.262	1.060
	ROA	0.017	0.013	-0.032	0.072

Non-Basel III Countries	CAP	0.153	0.069	0.061	1.093
	LIQ1	0.779	0.210	0.044	1.407
	LIQ2	0.818	0.101	0.423	0.968
	BS	0.247	0.021	0.200	0.294
	CTI	0.510	0.133	0.131	1.576
	NPL	0.043	0.078	0.000	1.650
	LLP	0.014	0.017	- 0.023	0.347
	g	0.049	0.032	-0.073	0.117
	π	0.066	0.081	-0.011	0.723
	r	0.101	0.057	0.030	0.270

Regression estimation requires the absence of multicollinearity. Although significance is noted in the correlation matrix, it demonstrates the absence of a strong correlation between the explanatory variables in the model. The levels seen below are less than the established literature threshold. As per Dormann et al. (2012), the correlation coefficient threshold between explanatory variables with $|r| > 0.7$ serves as a reliable indicator of the point at which collinearity begins to distort the model estimate and the predictive power significantly.

For the overall sample, the highest correlation, which is moderate, is between the liquidity variables. The correlation is negative between LIQ1 and LIQ2, meaning that the more LIQ1 explains bank profitability, the less LIQ2 explains bank profitability or vice versa. Non-performing loans and bank size have the same strength as inflation and bank size in explaining the bank profitability of emerging market banks in this model. For the Basel III countries, two correlations have equal strength in explaining the profitability of emerging market banks in this model. These correlations are between the liquidity variables, i.e., LIQ2 and LIQ1, and interest rate and LIQ2. At the same time, these are the highest correlations reported, regarded as moderate. Regarding Non-Basel III countries, the highest correlation between interest rate and inflation is noted. The correlation is positive, meaning that the higher the interest rate explains bank profitability, the higher inflation does. The correlation is, however, moderate. Other correlations that relatively have the same strength in explaining bank profitability as above include the correlation between bank size and capital.

Table 4 Pearson Correlation Matrix

		CAP	LIQ1	LIQ2	BS	CTI	NPL	LLP	g	π	r
Overall Sample	**CAP**	1.00									
	LIQ1	-0.10***	1.00								
	LIQ2	0.07***	-0.58***	1.00							
	BS	-0.36***	0.10***	-0.22***	1.00						
	CTI	0.06**	0.19***	-0.23***	-0.22***	1.00					
	NPL	0.11***	-0.17***	-0.00	-0.25***	0.12***	1.00				
	LLP	0.06**	0.02	-0.23***	-0.02	0.05**	0.44***	1.00			
	g	-0.17***	-0.15***	0.16***	0.07***	-0.17***	-0.11***	-0.15***	1.00		
	π	0.08***	-0.16***	-0.07***	-0.25***	-0.01	0.16***	0.13***	0.02	1.00	
	r	0.05**	0.07***	-0.45***	-0.21***	0.14***	0.25***	0.33***	-0.11***	0.49***	1.00
Basel III Countries	**CAP**	1.00									
	LIQ1	0.12***	1.00								
	LIQ2	0.23***	-0.58***	1.00							
	BS	-0.23***	0.44***	-0.44***	1.00						
	CTI	-0.33***	0.20***	-0.28***	0.17***	1.00					
	NPL	-0.08**	-0.31***	0.02	-0.28***	-0.01	1.00				
	LLP	0.11***	0.11***	-0.28***	-0.01	0.10***	0.23***	1.00			
	g	0.03	-0.15***	0.20***	-0.26***	-0.09**	-0.11***	-0.20***	1.00		
	π	-0.24***	-0.35***	-0.02	-0.28***	-0.14***	0.33***	0.09**	0.12***	1.00	
	r	-0.24***	0.09**	-0.58***	0.09**	0.07*	0.22***	0.36***	-0.13***	0.40***	1.00
Non-Basel III Countries	**CAP**	1.00									
	LIQ1	0.11***	1.00								
	LIQ2	0.03	-0.62***	1.00							
	BS	-0.64***	-0.13***	-0.05	1.00						
	CTI	0.27***	0.14***	-0.14***	-0.53***	1.00					
	NPL	0.22***	-0.09**	-0.03	-0.23***	0.23***	1.00				
	LLP	0.04	-0.14***	-0.11***	-0.03	-0.05	0.63***	1.00			
	g	-0.25***	-0.10***	0.13***	0.24***	-0.19***	-0.10***	-0.09**	1.00		
	π	0.17***	-0.04	-0.14***	-0.27***	0.12***	0.13***	0.20***	-0.10***	1.00	
	r	0.52***	0.07*	-0.16***	-0.58***	0.33***	0.33***	0.28***	-0.16***	0.68***	1.00

(***), (**) et (*) significant respectively at 1%,5 % et 10%.

4.2 Empirical Results

In demonstrating the effects of Basel III capital and liquidity regulation on bank profitability in emerging markets, this section shows the results of a dynamic panel model estimated using the system GMM. The results are presented by continents for overall emerging market countries, for emerging market countries subject to Basel III regulation, and emerging market countries not subject to the regulation. For robustness purposes, the results are reported without the COVID-19 period. Note that the American bank's results are not independently reported as with others due to an insufficient number of banks for a robust output. The American banks are, therefore, bundled up with other banks relevant to the research under the overall sample.

4.2.1 Return on Assets (ROA) Results

Table 4 below presents the results for the dynamic panel data model with ROA as the dependent variable for the overall sample. For the overall sample, profitability is explained by lagged variable ROA t-1, cost to income (CTI), inflation (π), bank size (BS), and capital (CAP). The lagged ROA t-1 variable asserts the model's dynamic nature, which is significant at a 1% significance level. Cost to income and bank size both negatively impact bank profitability. This implies an inverse relationship between these variables and bank performance. A negative impact of cost to income on bank profitability is in line with theory as explained by Magdalena et al. (2020), while a negative impact of bank size was contrary to most research such as that of Kosmidou et al. (2006), Anbar and Alper (2011), Tariq et al. (2014) and Kosmidou et al. (2005). For Africa, capital and none of the macroeconomic variables show a statistically significant impact on bank profitability. For Asia, all the macroeconomic variables are indicative of a statistically significant effect on bank profitability, with GDP growth showing a negative impact whilst the other two show a positive impact in line with theory.

Furthermore, LIQ2 and LLP add to CTI and lagged ROA t-1 to reflect variables that have significant predictive effects on bank profitability. The delayed variables ROA t-1, LIQ1, CTI, and LLP explain bank profitability for Europe. All these variables, except for the delayed variable ROA t-1, demonstrate a negative effect on bank profitability. The results of the Hansen statistic for the sample and sub-samples support the model, as none of the estimates had the autoregressive process of order 2.

Table 4 Overall Sample with ROA

Coefficients	**Overall**			
	All	**Africa**	**Asia**	**Europe**
ROA t-1	0.451*** (0.079)	0.437** (0.210)	0.366*** (0.068)	0.345** (0.132)
CAP	0.015** (0.007)	-0.009 (0.015)	0.019 (0.013)	-0.035 (0.022)
LIQ1	-0.001 (0.002)	-0.005 (0.007)	-0.004 (0.003)	-0.022** (0.007)
LIQ2	-0.005 (0.003)	-0.006 (0..009)	-0.007* (0.004)	-0.003 (0.008)
BS	-0.056** (0.022)	0.088 (0.057)	-0.039 (0.024)	0.199 (0.158)
CTI	-0.020*** (0.004)	-0.026*** (0.007)	-0.021*** (0.004)	-0.037*** (0.005)

NPL	0 (0.008)	0.008 (0.011)	-0.009 (0.011)	0.052 (0.029)
LLP	-0.071 (0.058)	-0.034 (0.052)	-0.239*** (0.046)	-0.263*** (0.0666)
g	-0.006 (0.007)	-0.031 (0.023)	-0.015*** (0.007)	0.058 (0.059)
π	0.024*** (0.007)	-0.008 (0.016)	0.019*** (0.007)	-0.016 (0.034)
r	0.013 (0.009)	-0.022 (0.041)	0.032*** (0.016)	0.000 (0.057)
_cons	0.029 (0.009)	-0.006 (0.023)	0.027 (0.010)	-0.001 (0.038)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	128	28	81	10
AR(1) (p-value)	-3.74 (0.000)	-1.85 (0.064)	-3.19 (0.001)	-1.75 (0.079)
AR(2) (p-value)	1.52 (0.127)	1.27 (0.203)	0.51 (0.613)	0.45 (0.656)
Hansen Statistic (p-value)	67.54 (0.086)	13.16 (0.155)	64.63 (0.131)	12.11 (0.207)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 5 below presents the results of a similar model still with ROA as the dependent variable. However, the samples have been adjusted for the COVID-19 pandemic period. With the overall sample, the results indicate that capital does not influence bank profitability compared to the unadjusted period. The macroeconomic factors that impact profitability have since changed to GDP growth (g) and interest rate (r), not inflation. For the Africa subsample, bank profitability is affected by the same variables shown for the unadjusted period. For Asia, the variables that impact bank profitability changed to the lagged variable ROA t-1, CAP, r, CTI, NPL, and LLP. The three latter variables have a negative impact on bank profitability. For the Europe sample, results show that delayed variable ROA t-1 and LLP only impact profitability.

Table 5 ROA results from Overall Sample adjusted for COVID-19

Coefficients	**Overall**			
	All Countries	**Africa**	**Asia**	**Europe**
ROA t-1	0.405** (0.159)	0.438** (0.207)	0.469*** (0.162)	0.670** (0.280)
CAP	0.012 (0.008)	-0.011 (0.019)	0.009* (0.005)	-0.029 (0.035)
LIQ1	-0.005 (0.003)	-0.009 (0.009)	-0.004 (0.003)	-0.013 (0.008)
LIQ2	-0.004 (0.004)	-0.005 (0.011)	-0.004 (0.004)	0.004 (0.014)
BS	-0.055* (0.029)	0.086 (0.073)	-0.018 (0.022)	0.115 (0.084)
CTI	-0.016*** (0.004)	-0.023** (0.011)	-0.014*** (0.004)	-0.022 (0.012)
NPL	-0.009 (0.008)	0.005 (0.015)	-0.017* (0.009	0.039 (0.043)
LLP	-0.011 (0.032)	-0.031 (0.054)	-0.184*** (0.047)	-0.148*** (0.044)
g	-0.021* (0.012)	0.005 (0.027)	-0.009 (0.010)	-0.057 (0.129)

π	0.015 (0.01)	0.012 (0.022)	-0.018 (0.013)	-0.037 (0.057)
r	0.015* (0.008)	-0.088 (0.061)	0.044** (0.020)	-0.018 (0.124)
_cons	0.027** (0.012)	0.009 (0.031)	0.016 (0.011)	-0.001 (0.037)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	128	28	81	10
AR(1) (p-value)	-2.43 (0.015)	-1.49 (0.135)	-2.85 (0.004)	-1.21 (0.226)
AR(2) (p-value)	0.790 (0.430)	0.81 (0.419)	0.17 (0.869)	-1.33 (0.183)
Hansen Statistic (p-value)	7.80 (0.253)	9.85 (0.131)	8.45 (0.207)	1.20 (0.273)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 6 below represents the results for Basel III countries with ROA as the dependent variable. For all Basel III countries, profitability is only explained and positively impacted by the lagged variable ROA t-1. Similarly, for the European sub-sample, bank profitability is explained by the same variable. Regarding the African sample, liquidity in LIQ2, credit quality in NPL, and the macroeconomic variable GDP growth affect profitability. All the variables show a positive impact on profitability. For Asia, the influence on bank profitability is explained by lagged variable ROA t-1, capital, bank size, non-performing loan, loan loss provision, and inflation. Moreover, the results only show a negative impact of LLP on bank profitability.

Table 6 ROA results Basel III Countries

Coefficients	**Basel III**			
	All	**Africa**	**Asia**	**Europe**
ROA t-1	0.368** (0.141)	0.411 (0.376)	0.145** (0.098)	0.345** (0.132)
CAP	0.034 (0.016)	-0.022 (0.025)	0.037 (0.016)	-0.035 (0.022)
LIQ1	-0.001 (0.003)	0.005 (0.005)	-0.002 (0.003)	-0.022 (0.007)
LIQ2	-0.002 (0.005)	0.012** (0.005)	0.002 (0.005)	-0.003 (0.008)
BS	0.062 (0.048)	0.070 (0.052)	0.090*** (0.066)	0.199 (0.158)
CTI	-0.021 (0.006)	0.026 (0.015)	-0.032 (0.003)	-0.037 (0.005)
NPL	0.008 (0.013)	0.023** (0.009)	0.004*** (0.015)	0.052 (0.029)
LLP	-0.011 (0.023)	0.025 (0.04)	-0.294* (0.054)	-0.263 (0.066)
g	0.016 (0.017)	0.108** (0.048)	-0.021 (0.012)	0.058 (0.059)
π	0.025 (0.015)	0.006 (0.019)	0.003*** (0.010)	-0.016 (0.034)
r	0.008 (0.007)	0.071 (0.079)	0.104 (0.020)	0.000 (0.057)
_cons	-0.003 (0.016)	-0.064** (0.026)	-0.009 (0.018)	-0.001 (0.038)

Year dummies	Yes	Yes	Yes	Yes
No. of Banks	65	11	39	10
AR(1) (p-value)	-2.41 (0.016)	-1.31 (0.189)	-4.22 (0.000)	-1.75 (0.079)
AR(2) (p-value)	0.52 (0.602)	0.56 (0.572)	-0.27 (0.790)	0.45 (0.656)
Hansen Statistic (p-value)	13.18 (0.155)	4.66 (0.324)	12.20 (0.202)	12.11 (0.207)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

When Basel III results are adjusted for the COVID-19 period, as in Table 7 below, the all-Basel III sample profitability is influenced not only by the lagged variable ROA t-1 but also by capital, non-performing loans, and inflation with all variables indicative of a positive impact, for Africa, liquidity and non-performing loans positively impact bank profitability. For Europe, loan loss provision negatively impacts bank profitability, while the lagged profit variable positively affects profitability. For Asia, the lagged variable, capital, bank size, and interest rate positively influence bank profit. Meanwhile, the cost to income and loan loss provision negatively impacts profitability for the Asian sub sample.

Table 7 ROA results Basel III Countries adjusted for COVID-19

Coefficients	**Basel III**			
	All	**Africa**	**Asia**	**Europe**
ROA t-1	0.578*** (0.169)	0.299 (0.389)	0.527*** (0.111)	0.67** (0.280)
CAP	0.023** (0.010)	0.005 (0.023)	0.025** (0.012)	-0.029 (0.035)
LIQ1	-0.001 (0.002)	0.008 (0.006)	0.000 (0.003)	-0.013 (0.008)
LIQ2	0.004 (0.003)	0.018** (0.007)	0.005 (0.004)	0.004 (0.014)
BS	0.036 (0.035)	0.164 (0.098)	0.084** (0.039)	0.115 (0.084)
CTI	-0.006 (0.004)	0.024 (0.016)	-0.019*** (0.004)	-0.022 (0.012)
NPL	0.015** (0.007)	0.036** (0.012)	0.003 (0.015)	0.039 (0.043)
LLP	0.013 (0.02)	0.053 (0.049)	-0.133** (0.056)	-0.148*** (0.044)
g	-0.022 (0.023)	0.13 (0.074)	-0.014 (0.024)	-0.057 (0.129)
π	0.032*** (0.012)	-0.004 (0.023)	-0.008 (0.017)	-0.037 (0.057)
r	0.006 (0.006)	0.098 (0.096)	0.061*** (0.022)	-0.018 (0.124)
_cons	-0.013 (0.011)	-0.100** (0.040)	-0.016 (0.012)	-0.001 (0.037)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	65	11	39	10
AR(1) (p-value)	-2.04 (0.042)	-1.46 (0.145)	-3.36 (0.001)	-1.21 (0.226)

AR(2) (p-value)	-0.33 (0.741)	-0.670 (0.504)	-0.70 (0.484)	-1.33 (0.183)
Hansen Statistic (p-value)	30.63 (0.243)	1.98 (0.159)	9.01 (0.173)	1.20 (0.273)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 8 shows the dynamic panel data results with ROA as the dependent variable for banks in countries under no Basel III regulation. It notes that for all countries, the lagged variable ROA t-1, liquidity, bank size, cost to income, loan loss provision, GDP growth, and inflation are all significant variables in determining bank profitability. The results show a negative impact on bank profitability by all the significant variables except for the lagged variable and inflation. When decomposed to the African sub-sample, liquidity, and GDP growth are the two variables that influence bank profitability and do so negatively. With regards to the Asian sub-sample, the significant variables include liquidity, bank size, cost of income, loan loss provision, and inflation. Of all the significant variables, the impact is negative except for inflation, which positively influences bank profitability.

Table 8 ROA results Non-Basel III Countries

Coefficients	**Non-Basel III**		
	All	**Africa**	**Asia**
ROA t-1	0.438*** (0.110)	1.01 (0.590)	0.23 (0.136)
CAP	0.002 (0.002)	0.006 (0.014)	0.005 (0.004)
LIQ1	-0.007*** (0.002)	-0.008** (0.003)	-0.006* (0.003)
LIQ2	-0.012*** (0.004)	-0.011 (0.007)	-0.015** (0.005)
BS	-0.100*** (0.026)	-0.237 (0.301)	-0.05** (0.019)
CTI	-0.033*** (0.005)	-0.016 (0.031)	-0.019*** (0.005)
NPL	0.005 (0.011)	0.022 (0.015)	0.003 (0.013)
LLP	-0.216*** (0.034)	-0.15 (0.092)	-0.248*** (0.046)
g	-0.018*** (0.006)	-0.082*** (0.025)	-0.004 (0.007)
π	0.024*** (0.006)	-0.024 (0.043)	0.034*** (0.007)
r	0.008 (0.012)	0.112 (0.143)	-0.004 (0.010)
_cons	0.051*** (0.011)	0.077*** (0.024)	0.04*** (0.010)
Year dummies	Yes	Yes	Yes
No. of Banks	63	17	42
AR(1) (p-value)	-3.20 (0.001)	-1.41 (0.158)	-1.87 (0.062)
AR(2) (p-value)	0.630 (0.528)	0.68 (0.496)	0.24 (0.807)
Hansen Statistic (p-value)	13.10 (0.158)	4.06 (0.255)	1.25 (0.263)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

In adjusting for the COVID-19 period, the non-Basel III countries' results show varied explanations of bank profitability, with macroeconomic variables playing no part in the influence. Only the lagged variable has a positive influence, while the rest of the significant variables harm bank profitability. For Africa, all the significant variables, in this case, LIQ1, CTI, LLP, and interest rate, negatively impact bank performance. For the Asian sub-sample, all significant variables, including LIQ2, BS, CTI, NPL, and LLP, negatively impact bank profitability.

Table 9 ROA results Non-Basel III Countries adjusted for COVID -19

Coefficients	**Non-Basel**		
	All	**Africa**	**Asia**
ROA t-1	0.322*** (0.109)	0.155 (0.170)	-0.012 (0.053)
CAP	0.003 (0.003)	-0.057 (0.034)	0.002 (0.003)
LIQ1	-0.01*** (0.003)	-0.019* (0.01)	-0.002 (0.004)
LIQ2	-0.018*** (0.006)	-0.029 (0.021)	-0.016*** (0.005)
BS	-0.137*** (0.033)	0.234 (0.328)	-0.056*** (0.026)
CTI	-0.037*** (0.007)	-0.078*** (0.016	-0.021*** (0.006)
NPL	-0.005 (0.011)	0.026 (0.021)	-0.025** (0.012)
LLP	-0.211*** (0.038)	-0.292*** (0.077)	-0.287*** (0.061)
g	-0.011	0.034 (0.028)	0.005 (0.012)
π	0.014	0.059 (0.043)	0.021 (0.02)
r	0.004	-0.206** (0.087)	0.005 (0.018)
_cons	0.07*** (0.014)	0.07 (0.064)	0.044*** (0.012)
Year dummies	Yes	Yes	Yes
No. of Banks	63	17	42
AR(1) (p-value)	-3.06 (0.002)	-2.29 (0.022)	-3.08 (0.002)
AR(2) (p-value)	0.66 (0.507)	1.09 (0.277)	0.20 (0.845)
Hansen Statistic (p-value)	6.52 (0.368)	8.79 (0.186)	6.39 (0.381)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

4.2.2 Return on Equity (ROE) Results

Table 10 below shows a similar model with ROE as the dependent variable. The sample positively and significantly impacts ROE via capital, inflation, and interest rates. Other significant variables impacting the performance are negative, and these include liquidity, bank size, and cost to income. The African sub-sample profitability is influenced positively and negatively by bank size and costs to income, respectively. For the Asian market, all variables except for non-performing loans significantly impact bank profitability. Some are positive, and others are negative. At the same time, for the European sample, the lagged variable ROE, t-1, liquidity, and cost to income have a significant influence on ROE with that of the lagged variable positive and the rest negative.

Table 10 ROE results from Overall Sample

Coefficients	**Overall**			
	All	**Africa**	**Asia**	**Europe**
ROE t-1	0.115 (0.101)	0.048 (0.09)	0.285* (0.105)	0.866*** (0.123)
CAP	0.120* (0.064)	-0.069 (0.154)	0.172* (0.102)	-0.26 (0.249)
LIQ1	-0.054** (0.022)	-0.028 (0.06)	-0.07*** (0.022)	-0.193*** (0.057)
LIQ2	-0.114** (0.046)	-0.055 (0.108)	-0.12** (0.042)	-0.061 (0.087)
BS	-0.876*** (0.250)	1.433* (0.703)	-0.497** (0.218)	0.841 (1.176)
CTI	-0.256*** (0.032)	-0.307*** (0.057)	-0.199*** (0.026)	-0.296*** (0.049)
NPL	-0.033 (0.064)	0.102 (0.109)	-0.127 (0.095)	0.454 (0.317)
LLP	-0.594 (0.428)	-0.539 (0.458)	-2.559*** (0.494)	-1.669 (0.972)
g	-0.168 (0.070)	0.074 (0.161)	-0.176** (0.077)	0.806 (0.464)
π	0.192** (0.038)	-0.042 (0.155)	0.188*** (0.045)	0.062 (0.273)
r	0.162*** (0.073)	-0.311 (0.265)	0.301** (0.131)	-0.300 (0.445)
_cons	0.587*** (0.1140	0.038 (0.265)	0.443*** (0.109)	0.228 (0.346)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	128	28	81	10
AR(1) (p-value)	-2.18 (0.029)	-0.88 (0.378)	-2.93 (0.003)	-1.77 (0.076)
AR(2) (p-value)	1.10 (0.272)	0.53 (0.596)	1.26 (0.206)	-0.41 (0.680)
Hansen Statistic (p-value)	69.36 (0.0650	2.86 (0.091)	62.84 (0.167)	1.94 (0.379)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 11 shows the ROE results adjusted for the COVID-19 period. Different from the unadjusted period, the all-inclusive sample for the bank performance estimated via ROE is negatively impacted by LIQ1, BS, CTI, NPL, and GDP and positively impacted by inflation and interest rate. For the African sample, impactful variables are unchanged from Table 10. For the Asian sample, capital and two macroeconomic factors, i.e., GDP and inflation, demonstrated no relationship to profitability compared to before the adjustment. At the same time, non-performing loans negatively impact profitability. Explanation of bank profitability for the European sample changes to capital, liquidity, cost to income, and loan loss provision when adjusted for the COVID-19 period. These variables influence the performance negatively.

Table 11 ROE results from Overall Sample adjusted for COVID -19

Coefficients	**Overall**			
	All	**Africa**	**Asia**	**Europe**
ROE t-1	0.074 (0.079)	-0.005 (0.057)	0.262* (0.136)	-0.354 (0.604)
CAP	0.075 (0.062)	-0.179 (0.235)	0.103 (0.065)	-0.654* (0.308)
LIQ1	-0.059** (0.025)	-0.048 (0.075)	-0.069** 90.029)	-0.224* (0.114)
LIQ2	-0.083 (0.054)	-0.073 (0.133)	-0.112** (0.056)	-0.085 (0.108)
BS	-0.917*** (0.286)	1.529* (0.864)	-0.442* (0.262)	2.585 (1.919)
CTI	-0.216*** (0.035)	-0.355*** (0.080)	-0.189*** (0.037)	-0.486** (0.163)
NPL	-0.139* (0.082)	0.067 (0.149)	-0.289** (0.133)	0.115 (0.192)
LLP	-0.364 (0.332)	-0.522 (0.471)	-2.653*** (0.643)	-2.565** (1.256)
g	-0.207* (0.114)	0.325 (0.261)	-0.125 (0.124)	-0.409 (0.786)
π	0.196** (0.095)	-0.058 (0.231)	-0.213 (0.134)	0.004 (0.0648)
r	0.176** (0.069)	-0.696 (0.497)	0.538*** (0.177)	-0.805 (0.940)
_cons	0.554*** (0.129)	0.224 (0.343)	0.428*** (0.141)	0.255 (0.266)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	128	28	81	10
AR(1) (p-value)	-1.89 (0.059)	0.18 (0.861)	-2.06 (0.039)	-0.46 (0.649)
AR(2) (p-value)	0.05 (0.957	-1.40 (0.162)	0.58 (0.560)	-0.69 (0.488)
Hansen Statistic (p-value)	37.49 (0.067)	2.62 (0.105)	34.49 (0.123)	1.25 (0.536)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 12 below shows the model for Basel III banks with ROE as the dependent variable. For the entire sample, bank profitability is positively influenced by bank size, GDP, and inflation. For Africa, the influence is only by GDP, while for Asia, it is by capital and cost to income. For Europe, profitability is positively explained by the lagged variable ROE t-1.

Table 12 ROE results Basel III Countries

Coefficients	**Basel III**			
	All	**Africa**	**Asia**	**Europe**
ROE t-1	-0.045 (0.037)	0.461 (0.396)	0.113 (0.185)	0.866*** (0.123)
CAP	0.464 (0.166)	-0.146 (0.226)	0.436** (0.163)	-0.26 (0.249)
LIQ1	-0.03 (0.036)	-0.024 (0.12)	-0.027 (0.028)	-0.193 (0.057)
LIQ2	-0.028 (0.073)	0.253 (1.191)	-0.03 (0.052)	-0.061 (0.087)
BS	0.626*** (0.495)	0.201 (0.825)	0.279 (0.477)	0.841 (1.176)
CTI	-0.289 (0.035)	0.627 (0.616)	-0.27*** (0.048)	-0.296 (0.049)
NPL	0.034 (0.107)	0.197 (0.193)	0.066 (0.134)	0.454 (0.317)
LLP	-0.067 (0.273)	0.175 (0.299)	-2.25 (0.608)	-1.669 (0.972)
g	0.016*** (0.209)	1.198** (0.46)	-0.215 (0.144)	0.806 (0.464)
π	0.450* (0.123)	0.053 (0.176)	0.276 (0.128)	0.062 (0.273)
r	0.167 (0.085)	1.294 (1.324)	0.688 (0.197)	-0.300 (0.445)
_cons	0.116 (0.178)	-0.715 (0.178)	0.172 (0.15)	0.228 (0.346)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	65	11	39	10
AR(1) (p-value)	-1.82 (0.069)	-0.01 (0.995)	2.85 (0.004)	-1.77 (0.076)
AR(2) (p-value)	0.63 (0.528)	-1.20 (0.232)	0.61 (0.543)	-0.41 (0.680)
Hansen Statistic (p-value)	14.96 (0.092)	1.99 (0.370)	14.10 (0.119)	1.94 (0.379)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 13 presents the results adjusted for COVID -19 for Basel III based banks with ROE as the dependent variable. It shows that, profitability is positively impacted by capital and inflation but negatively by cost to income for the entire sample. For the African sub-sample, all other variables have no influence over profitability except for non-performing loans, which positively impact bank profitability. For the Asian sub-sample, different from the view of Table 12, lagged variable ROE t-1, capital, and inflation positively explain profitability, while the cost to income and loan loss provision negatively influences bank profitability. The European sub-sample shows a positive and significant influence of the lagged variable ROE t-1 on bank profitability as well as a negative and significant impact of liquidity, cost to income, and loan loss provision on bank profitability.

Table 13 ROE results Basel III Countries adjusted for COVID -19

Coefficients	**Basel III**			
	All	**Africa**	**Asia**	**Europe**
ROE t-1	-0.016 (0.029)	0.234 (0.155)	0.577*** (0.098)	0.508** (0.168)
CAP	0.398*** (0.149)	-0.033 (0.261)	0.222*** (0.078)	-0.384 (0.226)
LIQ1	-0.031 (0.033)	0.024 (0.076)	0.003 (0.018)	-0.148** (0.057)
LIQ2	0.02 (0.067)	0.2 (0.111)	0.014 (0.032)	-0.02 (0.079)
BS	0.573 (0.489)	1.607 (1.119)	0.373 (0.235)	1.245 (0.705)
CTI	-0.218*** (0.043)	0.362 (0.267)	-0.154*** (0.035)	-0.253*** (0.065)
NPL	-0.004 (0.114)	0.377* (0.200)	0.126 (0.105)	0.193 (0.0328)
LLP	0.106 (0.214)	0.344 (0.511)	-1.033** (0.423)	-1.328*** (0.312)
g	-0.162 (0.334)	1.189 (0.831)	-0.058 (0.179)	-0.306 (1.014)
π	0.538*** (0.171)	0.002 (0.188)	0.039 (0.146)	-0.095 (0.469)
r	0.160* (0.085)	1.014 (0.786)	0.299* (0.155)	-0.534 (0.897)
_cons	0.087 (0.172)	-0.823 (0.602)	0.026 (0.083)	0.156 (0.262)
Year dummies	Yes	Yes	Yes	Yes
No. of Banks	65	11	39	10
AR(1) (p-value)	-2.78 (0.005)	-1.16 (0.246)	-3.02 (0.003)	-1.55 (0.133)
AR(2) (p-value)	-0.90 (0.369)	-1.58 (0.113)	-1.35 (0.177)	-1.25 (0.211)
Hansen Statistic (p-value)	7.36 (0.289)	2.91 (0.406)	8.52 (0.203)	0.97 (0.324)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

Table 14 presents the results for the non-Basel III model with ROE as the dependent variable. The table shows that the all-inclusive sample bank profitability is explained negatively by liquidity, cost to income, and positively by inflation. For the African sub-sample, all the significant variables, including liquidity, the cost of income, loan loss provision, and GDP, inversely impact bank profitability. In the Asian sub-sample, bank profitability is negatively influenced by liquidity, bank size, cost to income, and loan loss provision. Inflation, on the other hand, positively explains profitability in the Asian sub-sample.

Table 14 ROE results Non-Basel III Countries

Coefficients	**Non-Basel III**		
	All	**Africa**	**Asia**
ROE t-1	0.255 (0.156)	0.002 (0.491)	0.226 (0.156)
CAP	0.039 (0.032)	-0.064 (0.108)	0.05 (0.041)
LIQ1	-0.062*** (0.023)	-0.116* (0.063)	-0.096* (0.049)
LIQ2	-0.169*** (0.045)	-0.184* (0.102)	-0.205*** (0.065)
BS	-0.989 (0.266)	1.081 (2.476)	-0.676*** (0.230)
CTI	-0.302*** (0.046)	-0.505** (0.186)	-0.219*** (0.059)
NPL	0.005 (0.104)	0.213 (0.158)	-0.038 (0.144)
LLP	-2.03 (0.386)	-2.255** (0.872)	-3.181*** (0.789)
g	-0.146 (0.061)	-0.233** (0.094)	-0.056 (0.083)
π	0.203*** (0.047)	-0.571 (0.339)	0.305*** (0.038)
r	0.064 (0.120)	-0.559 (0.665)	0.038 (0.115)
_cons	0.684*** (0.132)	0.709* (0.405)	0.608*** (0.145)
Year dummies	Yes	Yes	Yes
No. of Banks	63	17	42
AR(1) (p-value)	-1.94 (0.052)	-1.83 (0.067)	-1.63 (0.103)
AR(2) (p-value)	0.67 (0.500)	-0.98 (0.327)	0.88 (0.378)
Hansen Statistic (p-value)	16.16 (0.064)	3.89 (0.274)	12.13 (0.206)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

The table below shows similar non-Basel III model results with ROE as the dependent variable. However, the results are adjusted for the COVID-19 period. Subsequently, the all-inclusive sample bank profitability is positively influenced by the lagged variable ROE t-1 and negatively impacted by liquidity, bank size, cost to income, loan loss provision, and GDP growth rate. For the African sub-sample, the impact on profitability is given by cost to income and loan loss provision, both of which negatively influence performance. Lastly in the Asian sub-sample, all the significant variables negatively impact the profitability of banks: liquidity, bank size, cost to income, non-performing loans, and loan loss provision.

Table 15 ROE results Non-Basel III Countries adjusted for COVID -19

Coefficients	**Non-Basel III**		
	All	**Africa**	**Asia**
ROE t-1	0.184* (0.101)	-1.125 (1.269)	0.129 (0.083)
CAP	0.018 (0.037)	-0.746 (0.611)	0.017 (0.022)
LIQ1	-0.084** (0.027)	-0.262 (0.173)	-0.066 (0.042)
LIQ2	-0.212*** (0.059)	-0.561 (0.332)	-0.236*** (0.075)
BS	-1.112*** (0.325)	5.159 (6.606)	-0.582** (0.292)
CTI	-0.320*** (0.056)	-1.162* (0.570)	-0.221*** (0.070)
NPL	-0.139 (0.102)	0.358 (0.315)	-0.306** (0.157)
LLP	-2.123*** (0.475)	-4.126* (2.331)	-4.025*** (1.064)
g	-0.199** (0.094)	-0.374 (0.646)	-0.021 (0.139)
π	0.091 (0.163)	-0.839 (1.081)	0.281 (0.216)
r	0.037 (0.150)	-2.981 (2.384)	0.078 (0.187)
_cons	0.757*** (0.158)	1.309 (0.897)	0.671*** (0.160)
Year dummies	Yes	Yes	Yes
No. of Banks	63	17	42
AR(1) (p-value)	-2.55 (0.011)	-1.18 (0.237)	-2.09 (0.036)
AR(2) (p-value)	0.41 (0.684)	0.12 (0.903)	0.67 (0.504)
Hansen Statistic (p-value)	36.78 (0.078)	0.76 (0.383)	32.51 (0.177)

(***), (**) et (*) significant respectively at 1%, 5% et 10%. The value in parentheses denotes the standard error.

4.3 Discussion

4.3.1 Bank Profitability and Bank Capital

The findings address research question one based on emerging markets that have adopted Basel III regulations. The results support the assertion that bank capital positively affects profitability. It is significant for the Basel III all countries sample with both proxies of profitability as used. The impact of the capital standard is positive on bank profitability. These results confirm those that Lee and Hsieh (2013) found, noting that well-capitalized banks pay less for insurance on various types of uninsured debt. Additionally, according to Berger (1995), expected bankruptcy costs of sound capitalized companies decline, which lowers borrowing costs and eventually raises profitability. Petria et al. (2015) assert that a high capital adequacy ratio can be associated with profitability since it shows that the bank is taking fewer risks. Mashamba (2018) concurs that banks with high capital have lower risks, improving their stability rankings and ability to source more money at cheaper prices, increasing profitability.

For non-Basel III markets, bank profitability is not impacted by capital. This is shown by both proxies of profitability used in the study. For that reason, there is evidence that not all aspects of bank capital influence the profitability of banks. However, these findings are contrary to those of Berger and Di Patti (2006), that higher capital regulatory requirements negatively impact banks' profitability and effectiveness. It is said that because of this unfavorable consequence, banks with bigger capital reserves have less cash available to explore potential future investment possibilities, decreasing their revenue and profits and ultimately resulting in lower operational and investment efficiency.

4.3.2 Bank Profitability and Liquidity

The study establishes that the observed variables on liquidity serving as determinants of profitability prove varying statistical outcomes. Similarly, findings are addressed based on emerging markets that have either adopted Basel III regulations or not. For countries that have adopted Basel III, the liquidity variables that are determinants of bank profitability, as used in this study, are statistical. For that reason, it is asserted that liquidity has no impact on bank profitability for emerging market banks subject to Basel III regulation. The outcomes are aligned with the findings from Molefe and Muzindutsi (2016) that there is no short and long-run relationship between banks' profitability and liquidity.

The study establishes that the liquidity variables are statistically significant for non-Basel III emerging markets and impact banks' profitability. Therefore, it is accentuated that liquidity remains a crucial indicator that must be carefully considered when developing approaches meant to increase profitability. The assertion from the study is that bank liquidity has a negative impact on profitability. The findings are in line with the study of Tran et al. (2016), which found that profitability and liquidity are inversely related, with an increase in liquidity resulting in a decrease in the amount of profits realized. Additionally, Molyneux and Thornton (1992) demonstrated a negative link between profitability and liquidity.

4.3.3 Bank Profitability and Bank Size

The study models the relationship between bank size and profitability. For countries under Basel III, there are varying results based on emerging markets as a whole and when adjusted for the COVID-19 period. When the COVID-19 period is excluded, there is no relationship between bank size and bank profitability under both profitability metrics adopted in the study. These findings align with those of Goddard et al. (2004) and Athanasoglou et al. (2008), who concluded that bank size does not impact bank profitability. On the contrary, when the COVID -19 period is included, ROE returns a positive and statistically significant relationship between bank size and profitability, which conforms to some research reports by Tariq et al. (2014), Kosmidou et al. (2006), Kosmidou et al. (2005) and Anbar and Alper (2011) that found a strong and positive association between the size and profitability of commercial banks under the assumption that larger banks are likely to have loan diversification than smaller banks, mostly due to the economies of scale.

For non-Basel III countries in emerging markets through ROA proxy as a measure of profitability, there is a negative and statistically significant relationship between bank size and profitability. This is in line with what some academics have discovered, which is an inverse relationship between profitability and bank size, such as Dietrich and Wanzenried (2011). They discovered that the primary cause of the negative association was the significant losses large banks suffered because of numerous unrecoverable loans. An inverse relationship between bank size and profitability was also shown by Kosmidou et al. (2005), suggesting that larger banks often produce smaller margins and profits. However, when profitability was considered through ROE for the same non-Basel III markets, there was no relationship between bank size and profitability. Nonetheless, when the COVID-19 period was adjusted for, based on both measures adopted for profitability. The results were consistent with the findings by Stiroh and Rumble (2006) and Pasiouras and Kosmidou (2007), which place the cause of the inverse link between bank size and profitability on agency fees, additional expenditures associated with large businesses, and administrative overhead.

4.3.4 Bank Profitability and Cost Efficiency

The relationship between cost-effectiveness and profitability was also the subject of this study. The focus is on emerging market countries under Basel III and those that are not, whereas for those under Basel III with COVID-19 period excluded, the results showed a negative and significant effect of cost to income on bank profitability in the case of ROE as profitability proxy. These results confirm those of Syafri et al. (2012), who found a negative impact of the cost-to-income ratio on the profitability of banks. Ahmad (2013) research also revealed that Saudi banks' capacity to profit from their operations was hampered by their cost-to-income ratio, which is a confirmation of the negative impact on profitability. In the case of ROA, the results showed a contrary view of no impact of the cost to income on bank profitability.

On the side of non-Basel III regime countries, the performance of banks shows a significant and negative impact on profitability as measured by both ROA and ROE. These results can be explained by the findings of Guru et al. (2002) and Kosmidou et al. (2006), wherein they explain that poor spending management was identified as one of the key causes of low profitability. Moreover, Sufian and Chong (2008) findings explain the negative impact of cost to income on profitability as a result of inadequate resource management.

4.3.5 Bank Profitability and Credit Quality

The study evaluated the relationship between profitability and credit quality using the loan loss provision ratio and non-performing loan ratio, which, in this study, are two operationalized metrics for credit quality. The focus is on the outcome of the impact of the two variables on bank profitability. Under Basel III, in the case of ROA, mixed outcomes vary by the COVID-19 periods for the two variables, whilst for ROE, the outcomes are consistent in both COVID-19 and non-COVID-19period for the two credit quality variables. When the COVID-19 period is covered in the study, credit quality in the form of loan loss provision ratio and non-performing loan ratio shows no impact on profitability with ROA and ROE as proxies of profitability. These findings confirm those of Qu (2007), who discovered that non-performing loan ratio and loan loss provision ratio do not affect profitability, contrary to the findings of Nisar et al. (2015) that credit quality is one of the most important indicators of the financial health of the banking sector and is closely related to the profitability. However, when the COVID-19 time is excluded, the ROE is consistent with the previous outcome, while on the other hand, the ROA for the non-performing loans ratio returns a significant and positive coefficient, which supports the assertions by Bhattarai (2016).

For markets under no Basel III, ROA, and ROE as measures of profitability excluding the COVID-19 period, the loan loss provision ratio has a significant and negative impact on profitability, while non-performing loans had no impact on bank profitability. When the COVID-19 period is covered, the loan loss provision ratio has mixed outcomes; in the case of ROA, there is a significant and negative impact, and in the case of ROE, there is no impact. For the non-performing loans ratio under both measures of bank profitability, i.e., ROA and ROE, there was no impact noted as there was no statistical significance recorded from the results.

4.3.6 Bank Profitability and Macroeconomic factors

The study also assessed the impact of GDP growth, inflation, and interest rates on bank profitability. For Basel III market results with ROA as a dependent variable, all three economic factors had no impact on bank profitability. However, when the COVID-19 period was excluded, inflation had a positive and significant coefficient as an indication of the positive influence on bank profitability. This positive influence is aligned with the results of Pasiouras and Kosmidou (2007) that if inflation is known, banks can promptly change interest rates, and the revenues can grow more quickly than the costs do, which has a good effect on profitability. When ROE is the dependent variable, the macroeconomic factors return mixed results. For the period including COVID -19, a positive and significant impact on profitability is confirmed for GDP growth and inflation, while interest rates showed no impact on bank profitability. A positive relationship between GDP growth and profitability is aligned with the findings of Basarir and Sarihan (2017) and Petria et al. (2015) that the likelihood of defaulting on bank loans decreases during economic expansions because borrowers are in a better financial situation and can pay their creditors when their loan instalments are due. When the COVID-19 period is excluded, the positive impact on profitability is noted for inflation and interest rates. The results of interest rate's positive impact on profitability align with the findings of Staikouras and Wood (2011), who confirmed that the level of interest rates had a considerable favorable impact on profitability.

For non-Basel III markets with ROA as the dependent variable for the period, including the COVID-19 period, GDP growth had a negative and significant impact on bank profitability, while inflation returned a positive and significant impact on bank profitability. In terms of interest rate, no significance was noted in the results. The negative and significant results of GDP growth on bank profitability confirm the findings of Satria et al. (2018), who show an inverse relationship between GDP growth and bank profitability when examining the factors affecting bank profitability. In the case of ROE as the dependent variable, only inflation has a positive and significant relationship with bank profitability, whilst GDP and inflation have no significant impact on profitability. When the period under investigation is adjusted to exclude the COVID-19 period and all the macroeconomic factors with the dependent variables, ROA and ROE, the results confirm no relationship or impact on bank profitability except for GDP growth when the dependent variable is ROE. In this instance, GDP growth has a negative and significant impact on bank profitability, which confirms the findings of Satria et al. (2018).

5.0 Conclusion

This research tries to analyse the impact of Basel III capital and liquidity regulation on the profitability of banks in emerging markets with a sample of 128 banks. The sample is further cascaded into banks under the Basel III regime and those that are not. In this study, we opted for several specific determinants in the bank and other macroeconomic factors in addition to the two Basel III requirements of capital and liquidity to assess the impact on profitability or performance. The econometric technique used is the dynamic panel (system GMM estimator). The research has shown that bank capital, liquidity, credit quality, bank size, and macroeconomic variables like GDP, inflation, and interest rates impact banks' profitability in emerging market economies. The results show that the impact of bank-specific factors on profitability relies on the performance metrics used, such as ROE and ROA. As such, the effects of these variables on ROA vary with those on ROE. Furthermore, the adjustment of the period for robustness to account for the COVID -19 period was pragmatic. Consequently, the analysis has demonstrated that banks' profitability is a complicated portfolio that needs to be managed well to be sustained over time. Therefore, from a strategy perspective, bank managers looking to maximize profitability should focus on the elements that significantly impact the banks' profitability and move to redirect other aspects of less significance.

The findings established that capital requirements because of Basel III regulation increased bank profitability for banks under the Basel III regime in emerging markets. However, liquidity has not influenced or impacted the profitability of the same emerging market banks under the Basel III regime. For emerging market banks not under the Basel III regime, capital had no impact on profitability, whilst liquidity had a negative impact. To that extent, Basel III capital requirements are seen to be impactful on the profitability of banks. Therefore, a recommendation that the focus of the banking industry in emerging markets should be to strengthen bank capital to ensure sustainable profitability in the long term could be spot on. This, in addition to the requirements to improve risk management and governance to leverage the capacity to withstand shocks from financial and economic stress, makes Basel III capital requirements imperative.

Following this, the authorities should consider enacting Basel III capital regulations for countries that have yet to adopt the regulations. Over and above the positive aspects of profitability, the regulations are touted to ensure efficient and secure financial systems to achieve long-term balanced developments, which would then include profitability. A paced approach to implementing the Basel III capital requirements could be adopted. For instance, regulations can be made such that bank managers build up to compliance within a particular time frame to avoid unwanted disruptions.

For Basel III liquidity requirements, since there is no conclusive confirmation from the findings that liquidity influences the profitability of banks in emerging market economies, adopting the Basel III liquidity requirements as a regulatory measure taken to strengthen the banking supervisory framework should be a good development. There should be no systemic vulnerabilities in terms of profitability in the banking system as a result of implementing tight liquidity requirements. Also, since the impact on profitability is negative for non-Basel III banks, adopting the Basel III framework will counteract the negative impact of before. Moreover, the literature emphasizes that the adoption of the requirements would prevent the overall collapse of the banking sector and the consequent knock-on effects on the real

economy under systemic pressures. Therefore, this would be beneficial to emerging markets in achieving long-term balanced development and absorbing different kinds of shocks.

This study also demonstrates the effects of different bank-specific and macroeconomic variables on banking institutions' profitability. The significance of the respective variables to profitability varies positively and negatively depending on the profitability metric used. This illustrates a good interlink of these variables and their spill-over effects on profitability. Banks need to be interested in and keep an eye on these variables to enhance performance.

The reliability of the sources, including the World Bank database and Eikon Reuters, determines the authenticity of the data utilized in this paper. The results of the study are based on a particular perspective of the subject and may have overlooked other important variables that explain bank profitability because the study concentrated on a few specific measures and did not include all measures that other studies concerning the determinants of bank profitability have provided. As such, if additional factors must be included to increase the model's robustness, this research might be enhanced.

6.0 REFERENCES

Aburime, U.T. (2009). Impact of political affiliation on bank profitability in Nigeria. African Journal of Accounting, Economics, Finance and Banking Research.

Adalsteinsson, G. (2014). The liquidity risk management guide: From policy to pitfalls. Wiley finance series.

Adelopo, I., Vichou, N. and Cheung, K.Y. 2021 Capital, Liquidity and Profitability in European Banks. Journal of Corporate Accounting and Finance.

Ahmad, R., & Matemilola, B. T. (2013). Determinants of bank profits and net interest margins. In Emerging Markets and Financial Resilience: Decoupling Growth from Turbulence. London: Palgrave Macmillan UK.

Ahn, S. C., & Moon, H. R. (2014). Large-N and large-T properties of panel data estimators and the Hausman test. Springer New York.

Akter, R., Ahmad, S. and Kulsum, U. (2019). A study on the implementation of Basel III: Bangladesh perspective. Academy of Strategic Management Journal.

Alali, S. M. (2019). The impact of bank liquidity on the profitability of commercial banks: An applied study on Jordanian commercial banks for the period (2013/2017). International Journal of Economics and Financial Issues.

Almazari, A. A. (2013). Capital adequacy, cost income ratio and the performance of Saudi banks. International Journal of Academic Research in Accounting, Finance and Management Sciences.

Altahtamouni, F., & Alyousef, S. (2021). The effect of liquidity according to the requirements of the Basel III committee on the profitability of banks: Evidence from Saudi banks. International Journal of Economics and Business Administration.

Anbar, A., & Alper, D. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. Business and economics research journal.

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.

Arellano, M. and Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics,

Ashyari, M. Z., & Rokhim, R. (2020). Revenue diversification and bank profitability: study on Indonesian banks. Jurnal Siasat Bisnis.

Athanasoglou, P.P., Brissimis, S.N. and Delis, M.D (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. International Financial Markets, Institutions, and Money.

Ayaydin, H., & Karakaya, A. (2014). The effect of bank capital on profitability and risk in Turkish banking. International Journal of Business and Social Science.

Baltagi, B. H., & Baltagi, B. H. (2008). Econometric analysis of panel data. Chichester: Wiley.

Baltagi, B. H., & Pirotte, A. (2010). Panel data inference under spatial dependence. Economic Modelling.

Bandt, D., B. Camara, A. Maitre, and P. Pessarossi. 2018. Optimal capital, regulatory requirements, and bank performance intimes of crisis: Evidence from France. Journal of Financial Stability 39.

Banerjee, R. N., & Mio, H. (2018). The impact of liquidity regulation on banks. Journal of Financial intermediation.

Barth, J. R., Caprio Jr, G., & Levine, R. (2013). Bank regulation and supervision in 180 countries from 1999 to 2011. Journal of Financial Economic Policy.

Basarır, C., & Sarıhan, A. Y. (2017). The relationship between profitability of banking sector and macroeconomic and financial variables: Panel ARDL application. Journal of Business Research Turk.

BCBS (2013). Principles for Sound Liquidity Risk Management and Supervision. Basel, Switzerland: Bank for International Settlements.

BCBS (2018). Basel Committee Charter. Basel, Switzerland: Bank for International Settlements.

BCBS (2019). Liquidity coverage ratio. Basel, Switzerland: Bank for International Settlements.

BCBS. (2011). Basel III: A global regulatory framework for more resilient banks and banking systems. Basel: Bank For International Settlements.

Beck, T., and Rojas-Suarez, L. (2019). Making Basel III work for emerging markets and developing Economies. A CGD Task Force Report. Washington, DC: Center for Global Development.

Becker, M. C., Knudsen, T. (2003). Schumpeter 1911: Farsighted Visions on Economic Development. The American Journal of Economics and Sociology.

Ben Naceur, S., & Goaied, M. (2008). The determinants of commercial bank interest margin and profitability: evidence from Tunisia. Frontiers in finance and economics.

Berger, A. N., & Di Patti, E. B. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. Journal of Banking & Finance.

Berger, A.N. (1995). The relationship between capital and earnings in banking. Journal of Money, Credit, and Banking.

Berka, M., & Zimmermann, C. (2018). The basel accord and financial intermediation: The impact of policy. Federal Reserve Bank of St. Louis Review.

Beyene, A. B. (2022). Governance quality and economic growth in Sub-Saharan Africa: the dynamic panel model. Journal of Economic and Administrative Sciences.

Bhattarai, Y. R. (2016). Effect of non-performing loan on the profitability of commercial banks in Nepal. The International Journal of Business and Management.

Bindseil, U. and Lamoot, J. (2011). The Basel III framework for liquidity standards and monetary policy implementation. Humboldt University of Berlin, Collaborative Research Center 649.

Blundell, R., and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics.

Bouheni, F. B., Ameur, H. B., Cheffou, A. I., & Jawadi, F. (2014). The effects of regulation and supervision on European banking profitability and risk: A panel data investigation. Journal of Applied Business Research.

Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia, Journal of Banking and Finance.

Buchory, H. A. (2015). Determinant of banking profitability in Indonesian regional development bank. Paper presented at the First International Conference "Actual Economy: Local Solutions for Global Challenges.

Bučková, V., & Reuse, S. (2011). Basel III Global Liquidity Standards: Critical Discussion and Impact onto the European Banking Sector. Financial Assets and Investing.

Burchi, A. and Martelli, D. (2016), "Possible Unintended Consequences of Basel III on Emerging Markets and Developing Economies: Assessment of Stressed VaR and Effects on Banks' Investment Decisions", Risk Management in Emerging Markets, Emerald Group Publishing Limited.

Bwacha, C.R., and Xi, J. (2018). The impact of liquidity on profitability: An explanatory study of the banking sector between 2008 and 2017. UMEA School of Business, Economics and Statistics

Bywalec, M., Dudynets, L., & Swacha-Lech, M. (2020). Financial situation of the banking sector in Ukraine in 2013-2018 from the point of view of changes in selected financial indicators of key Ukrainian banks. In 35th IBIMA Conference Proceedings.

Carletti, E., Goldstein, I., & Leonello, A. (2018). The interdependence of bank capital and liquidity.

Chiaramonte, L., and B. Casu. 2017. Capital and liquidity ratios and financial distress. Evidence from the European banking indus try. The British Accounting Review.

Chortareas, G. E., Girardone, C., & Ventouri, A. (2012). Bank supervision, regulation, and efficiency: Evidence from the European Union. Journal of financial stability.

Christian, C., Moffitt, J. S., & Suberly, L. A. (2008). Fundamental analysis for evaluating bank performance: what variables provide the greatest insight into future earnings?. Bank Accounting & Finance.

Davies, K. (2014) Managing liquidity risks. Enhancing Risk Management and Governance in the Region's Banking System to Implement Basel II and to Meet Contemporary Risks and Challenges Arising from the Global Banking System.

Deli, Y. D., & Hasan, I. (2017). Real effects of bank capital regulations: Global evidence. Journal of Banking & Finance.

Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland. Journal of International Financial Markets, Institutions and Money.

Dietrich, A., Hess, K. & Wanzenried, G. (2014). The good and bad news about the new liquidity rules of Basel III in Western European countries. Journal of Banking & Finance

Dormann, C. F., Schymanski, S. J., Cabral, J., Chuine, I., Graham, C., Hartig, F., ... & Singer, A. (2012). Correlation and process in species distribution models: bridging a dichotomy. Journal of Biogeography.

Durand, P. (2019). Determinants of banks' profitability: Do Basel III liquidity and capital ratios matter? Economix, Working Paper.

Fang, X., Jutrsa, D., Peria, S. M., Presbitero, A. F., and Ratnovski, L. (2022). Bank capital requirements and lending in emerging markets: The role of bank characteristics and economic conditions. Journal of Banking & Finance.

Ferreira, C., Jenkinson, N., & Wilson, C. (2019). From Basel I to Basel III: Sequencing implementation in developing economies. International Monetary Fund.

Frees, Edward W. (2004). Longitudinal and Panel Data: Analysis and Applications in the Social Sciences.West Nyack, NY, USA: Cambridge University Press, 2004

FSI (2019). Definition of capital in Basel III. Basel, Switzerland: Bank for International Settlements.

Fu, J. (2020). Analysis of the Influencing Factors of Commercial Banks' Profitability: Based on the Comparison between State-owned Commercial Banks and Joint-stock Commercial Banks. Times Finance.

Gavalas, D. and Syriopoulos, T. 2014 (2014). Basel III and its Effects on Banking Performance: Investigating Lending Rates and Loan Quantity. Journal of Finance and Bank Management.

Giordana, G. A., & Schumacher, I. (2017). An empirical study on the impact of Basel III standards on banks' default risk: The case of Luxembourg. Journal of Risk Financial Management.

Goddard, J., Molyneux, P., and Wilson, J. O. (2004). The profitability of European banks: a cross-sectional and dynamic panel analysis. The Manchester School.

Goel, S., and Kumar, R. (2013). Basel III: An Enhancement of Basel II Norms. International Journal of Research in Management, Science & Technology.

Golubeva, O., Duljic, M., & Keminen, R. (2019). The impact of liquidity risk on bank profitability: some empirical evidence from the European banks following the introduction of Basel III regulations. Journal of Accounting and Management Information Systems.

Gomes, T., & Khan, N. (2011). Strengthening bank management of liquidity risk: The Basel III liquidity standards. Bank of Canada Financial System Review.

Gomes, T., and Wilkins, C. (2013). The Basel III Liquidity Standards: An Update. Bank of Canada. Financial System Review.

Gržeta, I., Žiković, S., & Tomas Žiković, I. (2023). Size matters: analyzing bank profitability and efficiency under the Basel III framework. Financial innovation.

Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics. McGraw-hill.

Gunawan, A., Triansyah, F. A., Karlina, R., Yusuf, G., Dinantika, A. R., & Wahyudi, A. (2023). Econometric Model of Economic Growth in Indonesia using dynamic panel data using the FD-GMM Arellano-Bond and SYS-GMM Blundell-Bond Approaches. Kontigensi: Jurnal Ilmiah Manajemen.

Guru, B. K., Staunton, J., and Balashanmugam, B. (2002). Determinants of commercial bank profitability in Malaysia. Journal of Money, Credit, and Banking.

Hadush, M., Gebregziabher, K., & Biruk, S. (2023). Determinants of economic growth in East African countries: A dynamic panel model approach. Cogent Economics & Finance.

Härle, P., Lüders, E., Pepanides, T., Pfetsch, S., Poppensieker, T., & Stegemann, U. (2010). Basel III and European banking: Its impact, how banks might respond, and the challenges of implementation. EMEA Banking.

Hassan, M.K. and A.M. Bashir, (2003), Determinants of Islamic Banking Profitability, Economic Research Forum (ERF).

Hess, K., & Francis, G. (2004). Cost income ratio benchmarking in banking: a case study. Benchmarking: An International Journal.

Hohl, S., Sison, M. C., Stastny, T., and Zamil, R. (2018). The Basel Framework in 100 Jurisdictions: Implementation Status and Proportionality Practices. Financial Stability Institute Insights on Policy Implementation No. 11. Basel, Switzerland: Bank for International Settlements.

Hsiao, C., & Zhou, Q. (2023). Maximum Likelihood Estimation of Dynamic Panel Data Models with Interactive Effects: Quasi-Differencing Over Time or Across Individuals?. In Essays in Honor of Joon Y. Park: Econometric Methodology in Empirical Applications. Emerald Publishing Limited.

Hussain, S. (2014). The assessment of operational efficiency of commercial banks in India using cost to income ratio approach.

Jayadev, M. (2013). Basel III implementation: Issues and challenges for Indian banks. IIMB Management Review.

Jigeer, S., & Koroleva, E. (2023). The determinants of profitability in the city commercial banks: Case of China. Risks.

Johansson, E. (2012). Basel III – A study of Basel III and whether it may protect against new banking failures. Jönköping University.

Jones, E., Beck, T., and Knaack, P. (2018). Room to Manoeuvre: How Developing Countries Can Tailor Basel Standards. Oxford: Blavatnik School of Government.

Kasakende, L., Bagyenda, J. and Brownbridge, M. (2012). Basel III and the global reform of financial regulation: How should Africa respond? A Bank regulator's rerspective. Kampala: Bank of Uganda.

Kashyap, A. K., Tsomocos, D. P., & Vardoulakis, A. P. (2017). Optimal bank regulation in the presence of credit and run risk. National Bureau of Economic Research.

Keele, L., & Kelly, N. J. (2006). Dynamic models for dynamic theories: The ins and outs of lagged dependent variables. Political analysis.

Khrawish, H.A. (2011). Determinants of Commercial Banks Performance Evidence from Jordan. International Research Journal of Finance and Economics.

King, P., and Tarbert, H. (2011). Basel III: An overview. Banking & Financial Services Policy Report. Aspen publishers.

Kosmidou, K., Pasiouras, F., Doumpos, M., and Zopounidis, C. (2006). Assessing performance factors in the UK banking sector.

Kosmidou, K., Pasiouras, F., Zopounidis, C. and Doumpos, M. (2006). A multivariate analysis of the financial characteristics of foreign and domestic banks in the UK.

Kroszner, R. (1998). On the Political Economy of Banking and Financial Regulatory Reform in Emerging Markets. University of Chicago - Booth School of Business; National Bureau of Economic Research.

Le, T. N. L., Nasir, M. A., & Huynh, T. L. D. (2023). Capital requirements and banks performance under Basel-III: A comparative analysis of Australian and British banks. The Quarterly Review of Economics and Finance.

Le, T.N.L., Nasir, M.A and Huynh, T.L.D (2020). Capital requirements and banks performance under Basel-III: A comparative analysis of Australian and British banks. Quarterly Review of Economics and Finance.

Lee, C-C. & Hsieh, M-F. (2013). The impact of bank capital on profitability and risk in Asian banking. Journal of International Money and Finance.

Lee, E. (2014). Basel III and its new capital requirements, as distinguished from Basel II. Banking LJ.

Lee, L. F., & Yu, J. (2010). Estimation of spatial autoregressive panel data models with fixed effects. Journal of econometrics.

Lotto, J. (2019). Evaluation of factors influencing bank operating efficiency in Tanzanian banking sector. Cogent Economics and Finance.

Mahapatra, B. (2012). Implications of Basel III for Capital, Liquidity and Profitability of Banks. RBI Monthly Bulletin.

Majumder, T.H., and Li, X. (2018). Bank risk and performance in an emerging market setting: the case of Bangladesh. Journal of Economics, Finance and Administrative Science.

Mamatzakis, E., and Remoundos, P. (2003). Determinants of Greek commercial banks, 1989-2000. Spoudai.

Mashamba, T. (2018). The effect of Basel III liquidity regulations on banks' profitability. Journal of Governance and Regulation.

Mbekomize, C.J. and Mapharing, M. (2017). Analysis of determinants of profitability of commercial banks in Botswana. International Journal of Academic Research in Accounting, Finance and Management Sciences.

McNamara, C. M., Wedow, M., and Metrick, A. (2019). Basel III B: Basel III Overview. Journal of Financial Crises

Messai, A. S., Gallali, M. I. and Jouini, F. (2015). Determinants of Bank Profitability in Western European Countries Evidence from System GMM Estimates. International Business Research.

Molefe, B., & Muzindutsi, P. F. (2016). Effect of capital and liquidity management on profitability of major South African banks. In Proceedings of the 28th Conference of the South African Institute of Management Scientists.

Molyneux, P. and Thornton, J. (1992). Determinants of European bank profitability: A note. Journal of Banking and Finance.

Neyapti, B., & Dincer, N. N. (2014). Macroeconomic Impact of Bank Regulation and Supervision: A cross-country investigation. Emerging Markets Finance and Trade.

Nisar, S., Susheng, W., Jaleel, A., & Ke, P. (2015). Determinants of bank's profitability in Pakistan: A latest panel data evidence. International Journal of Economics, Commerce and Management.

Noman, A. H., Mustafa, M. C., Najmeen, J. C., Mohammad, J. K., & Sajeda, P. (2015). The effect of bank specific and macroeconomic determinants of banking profitability: A study on Bangladesh. International Journal of Business and Management.

Nucu, A. E. (2011). The Challenges of Basel III for Romanian Banking System. Theoretical and Applied Economics.

Oyetade, D., Obalade, A. A. and Muzinduts, P. (2022) Changes in Basel capital requirements and lending ability of African commercial banks. Journal of Central Banking Theory and Practice.

Ozili, P. K. (2015). Determinants of bank profitability and Basel capital regulation: Empirical evidence from Nigeria. Research Journal of Finance and Accounting.

Ozili, P. K. (2017). Bank profitability and capital regulation: Evidence from listed and non-listed banks in Africa. Journal of African Business.

Ozkan, M. F. G., & Unsal, M. F. (2012). Global financial crisis, financial contagion, and emerging markets. International Monetary Fund.

Pasiouras, F. and Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. Research in International Business and Finance.

Petria, N. Capraru, B., & Ihnatov, L. (2015). Determinants of Banks'Profitability: Evidence from EU 27 Banking Systems. Procedia Economics and Finance.

Pham, N. H., Hoang, T. M. and Pham, N. T. H (2022) The impact of capital structure on bank profitability: evidence from Vietnam, Cogent Business & Management.

Qu, X. (2007). Analysis on the Factors of Profit-Making Ability Model of Commercial Banks in China (Doctoral dissertation, Southwestern University of Finance and Economics).

Rahman, M. M., Hamid, K., Khan, A. M. (2015). Determinants of Bank Profitability: Empirical Evidence from Bangladesh. International Journal of Business and Management.

Rochet, J. C. (2008). Liquidity regulation and the lender of last resort. Financial Stability Review.

Roulet, C. 2018. Basel III: Efects of capital and liquidity regulations on European bank lending. Journal of Economics and Business.

Sabunwala, Z. Z., (2012). Impact of Basel III Norms on Banking Sector in Emerging Markets. Journal of Management & Research.

Saeed, M.S. (2014). Bank-related, industry-related, and macroeconomic factors affecting bank profitability: A case of the United Kingdom. Research Journal of Finance and Accounting.

Said, R.M (2018). Basel III new liquidity framework and Malaysian commercial banks profitability. Journal Pengurusan.

Saif-Alyousfi, A. Y., Saha, A., & Md-Rus, R. (2017). Profitability of Saudi commercial banks: A comparative evaluation between domestic and foreign banks using CAMEL parameters. International Journal of Economics and Financial Issues.

San, O. T., and Heng, T. B. (2013). Factors affecting the profitability of Malaysian commercial banks. African Journal of Business Management.

Sastrosuwito, S. and Suzuki, Y. (2012). The determinants of post-crisis Indonesian banking system profitability. Economics and Finance Review.

Satria, I., Supriyadi, E., Irfani, A., and Djamil, A. (2018). The most important factors affecting profitability of the top 10 commercial banks in Asian. The International Journal of Social Sciences and Humanities Invention.

Shakdwipee, P., and Mehta, M. (2017). From Basel I to Basel II to Basel III. International Journal of New Technology and Research.

Smirlock, M. (1985). Evidence on the (non) relationship between concentration and profitability in banking. Journal of money, credit and Banking.

Soprano, A. (2015). Liquidity management: a funding risk handbook. John Wiley & Sons.

Staikouras, C. K., & Wood, G. E. (2004). The determinants of European bank profitability. International Business & Economics Research Journal (IBER).

Staikouras, C. K., and Wood, G. E. (2011). The determinants of European bank profitability. International Business and Economics Research Journal.

Stiroh, K. J., & Rumble, A. (2006). The dark side of diversification: The case of US financial holding companies. Journal of banking & finance.

Sufian, F., & Chong, R. R. (2008). Determinants of bank profitability in a developing economy: empirical evidence from the Philippines. Asian Academy of Management Journal of Accounting & Finance.

Sufian, F., & Habibullah, M. S. (2009). Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. Frontiers of Economics in China.

Sutorova, B., & Teply, P. (2014). The level of capital and the value of EU banks under Basel III. Prague Economic Papers.

Swamy, V. (2014). Modelling the impact of new capital regulations on bank profitability.

Swamy, V. (2018). Basel III capital regulations and bank profitability. Review of Financial Economics.

Syafri, M. (2012). Factors affecting bank profitability in Indonesia. Paper presented at the The 2012 International Conference on Business and Management.

Tanna, S., Kosmidou, K. and Pasiouras, F. (2005). Determinants of profitability of domestic UK commercial banks: panel evidence from the period 1995-2002. Money Macro and Finance (MMF) Research Group Conference 2005.

Tariq, W., Usman, M., Mir, H. Z., Aman, I., and Ali, I. (2014). Determinants of Commercial Banks Profitability: Empirical Evidence from Pakistan. International Journal of Accounting and Financial Reporting.

Taskinsoy, J. (2018). Effects of Basel III higher capital and liquidity requirements on banking sectors across the main South East Asian Nations. International Journal of Scientific & Engineering Research.

Tran, V. T., Lin, C.-T., and Nguyen, H. (2016). Liquidity creation, regulatory capital, and bank profitability. International Review of Financial Analysis.

Walker, G. A., (2011). Basel III market and regulatory compromise. Journal of Banking Regulation.

Welch, P. (2006). Rethinking bank efficiency: The failings of the cost-income efficiency ratio.

Wooldridge, J. M. (2009). Econometrics: Panel Data Methods.

Yaacob, S. F., Rahman, A. A., & Karim, Z. A. (2016). The determinants of liquidity risk: A panel study of Islamic banks in Malaysia. Journal of Contemporary Issues and Thought.

Yan, M., Hall, M. J., & Turner, P. (2012). A cost–benefit analysis of Basel III: Some evidence from the UK. International Review of Financial Analysis.

Yang, Z., Gan, C. and Li, Z. (2019). Role of bank regulation on bank performance: Evidence from Asia-Pacific commercial banks. Journal of Risk and Financial Management.

Yusuf, M. O., Nwufo, C. I., and Chima, E. I. (2019). Optimum synergy between liquidity and profitability management of quoted banks: The Nigerian perspective. International Journal of Academic Research in Accounting, Finance and Management Sciences.

Zarra-Nezhad, M., Hasanvand, M., & Hadi Akbarzadeh, M. (2014). The shadow economy and globalization: a comparison between difference GMM and system GMM approaches. International Journal of Business and Development Studies.

Zheng, C., Rahman, M. M., Begum, M., & Ashraf, B. N. (2017). Capital regulation, the cost of financial intermediation and bank profitability: Evidence from Bangladesh. Journal of Risk and Financial Management.