RESEARCH ARTICLE

Financial Performance Uncovered: Asian Commercial, Savings, and Islamic Banks in Focus

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Abstract

This study delves into the financial performance analysis of commercial, savings, and Islamic banks across five Asian economies: Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam. By focusing on key metrics such as Return on Assets (ROA), Net Interest Margin (NIM), Non-Performing Loan (NPL) ratio, and Loan-to-Deposit (LTD) ratio, this research provides a comprehensive comparison of these three types of banks. Utilizing data from 2010 to 2022 sourced from the Orbis database, the analysis employs random effects regression and dynamic panel-data estimation (Two-Step System GMM) to ensure robust results. The findings indicate that while savings banks tend to have higher NIM and ROA compared to commercial banks, these differences are not statistically significant. This suggests that, although there may be a tendency for savings banks to perform better in these areas, the variations are not substantial enough to be deemed conclusive. Consequently, it implies that the financial performance of savings banks, commercial banks, and Islamic banks may not differ markedly in terms of profitability and interest margins within the studied regions. Islamic banks, adhering to Sharia-compliant financial principles, show lower NIM and ROA, reflecting their unique operational frameworks. This study contributes to the literature by offering a detailed cross-country analysis of different banking models in Asia, highlighting the impact of regulatory environments, economic conditions, and institutional characteristics on key performance metrics. The results provide valuable insights for stakeholders, including investors, regulators, and policymakers, to make informed decisions and enhance the stability and performance of the banking sector.

Keywords: Financial Performance, Islamic Banks, Commercial Banks, Savings Banks, Asian Economies.

1. Introduction

The banking sector, as a vital component of the global economy, holds a pivotal position in providing indispensable financial services that drive economic growth and ensure stability. Acting as intermediaries between savers and

borrowers, banks play a crucial role in mobilizing savings and channelling them towards productive investments. This function is fundamental in fostering economic development, empowering businesses to finance expansion projects, enabling households to acquire homes, and supporting governments in funding infrastructure initiatives. By extending credit, banks facilitate entrepreneurship and innovation, leading to job creation and enhanced productivity. Moreover, banks offer a range of essential services, including payment systems, risk management products, and financial advisory services, which are integral to the seamless functioning of modern economies[1][2].

In addition to their role in facilitating investment and growth, banks play a critical role in maintaining financial stability. Various financial metrics, such as Return on Assets (ROA), Net Interest Margin (NIM), Loan to Deposit (LTD) ratio, and Non-Performing Loan (NPL) ratio, are pivotal in assessing the performance and stability of banks[3][4]. High ROA values reflect well-managed institutions capable of weathering economic downturns, thus contributing to the resilience of the financial system. The NIM, representing the difference between interest income earned and interest expenses, serves as a key indicator of a bank's profitability and efficiency[5][6]. An optimal LTD ratio, which compares a bank's total loans to its total deposits, ensures liquidity and impacts profitability[7][8]. The NPL ratio, indicating the quality of the bank's loan portfolio, is crucial for understanding the risk management efficiency and financial health of banks[9][10].

Effective management of these metrics is essential for banks to provide stability during economic imbalances or crises by offering liquidity and credit, thereby helping to stabilize markets and restore confidence. By managing risks and maintaining adequate capital reserves, banks ensure the stability and integrity of the financial system, preventing financial crises and sustaining long-term economic growth[2]. The combined assessment of ROA, NIM, LTD ratio, and NPL ratio provides a comprehensive evaluation of the performance and stability of savings, commercial, and Islamic banks across Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam. Findings herein indicate that savings banks generally exhibit higher NIM and ROA compared to commercial banks, although these differences are not statistically significant. However, savings banks face higher NPL ratios, particularly in South Korea, suggesting greater challenges in loan performance management. These results contrast with typical findings in existing literature, which often highlight the conservative nature and lower risk profiles of savings banks[11][12]. Commercial banks benefit from higher leverage in terms of ROA, attributable to diverse revenue streams and aggressive asset management strategies. Islamic banks, constrained by Sharia-compliant financial principles, show lower NIM and ROA, reflecting their unique operational frameworks, as observed in Malaysia. Comparing and understanding these metrics is crucial for stakeholders, including investors, regulators, and policymakers, as it highlights the strengths and weaknesses of different banking models, enabling them to adopt best practices and make informed decisions to ensure the health and resilience of the banking sector[13].

This study applies the Resource-Based View (RBV) theory to evaluate and compare the financial performance of savings, commercial, and Islamic banks. The research aims to investigate differences in key financial metrics (ROA, NPL ratio, NIM, and LTD ratio) between commercial and savings banks. Specifically, this study seeks to answer the following research question: What are the differences in key financial performance metrics between commercial banks and savings banks?

The paper follows this structure: Section 2 reviews relevant literature, providing essential context. Section 3 identifies the

research gap, laying the foundation for the study. Section 4 details the data methodology, establishing the framework for the empirical analysis and formulating research questions. Section 5 presents the empirical results and discussion, offering an in-depth analysis of the study's findings. Section 6 concludes by summarizing key insights, acknowledging limitations, and suggesting future research directions, effectively bridging theory and empirical evidence.

2. Literature Review

2.1. Performance Metrics

2.1.1. Return on Assets (ROA)

ROA is a pivotal financial ratio that assesses the profitability and operational efficiency of a bank by gauging its ability to generate returns from its asset base. Mathematically expressed as net income divided by total assets, ROA serves as a barometer for managerial competence in optimizing resource utilization to drive profitable growth[14]. Its significance stems from its comprehensive encapsulation of a bank's overall performance, capturing the interplay between revenue generation, cost management, and asset deployment strategies[15]. A higher ROA ratio signals enhanced asset productivity, translating into superior returns for shareholders and fortifying the bank's competitive positioning within the industry landscape. Across the regions of Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam, numerous studies have highlighted the importance of ROA in evaluating bank performance, efficiency, and profitability. Factors such as credit risk, capital adequacy, liquidity risk, income diversification, corporate governance, and macroeconomic conditions have been identified as significant determinants of ROA for banks in these countries.

The research on ROA and bank performance across commercial, savings, and Islamic banks reveals various factors influencing ROA. For example[16], explores the financial performance of Islamic commercial banks in Indonesia, identifying significant effects of Capital Adequacy Ratio (CAR), Operating Expense to Operating Income (BOPO), and Financing to Deposit Ratio (FDR) on ROA, while Non-Performing Financing (NPF) shows no significant effect.[17] studies the effect of operational, liquidity, and credit risks on ROA in national Islamic commercial banks, finding significant negative impacts of credit risk, operational risk, and technological risk on ROA.[18] analyzes the direct and indirect effects of financial performance indicators like NPF, FDR, and BOPO on profit-sharing rates through ROA in Islamic commercial banks, concluding that ROA mediates the effects of NPF and BOPO on profit-sharing rates. These findings underscore the multifaceted role of ROA in evaluating bank performance, influencing strategic decision-making, risk mitigation, and stakeholder confidence across different banking models.

2.1.2. Net Interest Margin (NIM)

NIM is a crucial metric for evaluating bank profitability, representing the difference between the interest income earned from assets and the interest expenses on liabilities, as a percentage of total interest-earning assets. Higher NIM indicates a bank's ability to earn a higher return on its assets, positively impacting its profitability. In the context of Hong Kong,

Malaysia, Taiwan, Vietnam, and South Korea, several studies have highlighted the importance of NIM in assessing bank performance across commercial, savings, and Islamic banks. For instance,[7] identified that factors such as the loan-to-deposit ratio, operating expenses, and leverage significantly influence NIM in ASEAN banks, including those in Malaysia and South Korea. Similarly,[19] found that lending scale, capitalization, and inflation positively impact NIM in Vietnam's banking sector, whereas managerial efficiency has a negative effect. These studies underscore the multifaceted role of NIM in determining bank profitability and performance.

Research on NIM across different banking models reveals varied influences on this metric. In Islamic banks,[20], demonstrated significant negative effects of earning asset quality and non-performing financing on NIM. In Malaysia,[21], highlighted that market competition, capital intensity, and inflation significantly impact NIM. Additionally, studies by[22] and[23] indicated that the financing-to-deposit ratio and macroeconomic indicators like GDP are crucial determinants of NIM in Islamic banks. These findings suggest that NIM is a critical indicator of bank performance, influenced by various internal and external factors, and plays a vital role in strategic decision-making and financial management across different types of banks in the specified regions.

2.1.3. Non-Performing Loans (NPL)

The NPL ratio is a crucial indicator of bank performance, significantly affecting profitability and financial stability in commercial, savings, and Islamic banks. Research indicates that a higher NPL ratio negatively impacts key performance metrics such as ROA and ROE, highlighting the detrimental effect of credit risk on bank profitability. For example, studies on Vietnamese commercial banks reveal that factors such as provision for credit risk, foreign investor ownership, and bank size significantly influence the NPL ratio, with higher NPL ratios correlating with lower ROA and ROE[9][10]. In Taiwan, effective credit risk management is emphasized as NPLs significantly negatively affect financial performance[24]. Similarly, in Hong Kong and Malaysia, Islamic banks face challenges in managing NPLs due to higher operational costs and regulatory constraints, while commercial banks in Hong Kong benefit from better management and economies of scale[7]. In South Korea, savings banks face higher NPL ratios, suggesting greater challenges in loan performance management[25].

Research in Malaysia has further identified key factors impacting NPLs, including interest rates, producer price index, and macroeconomic variables such as output[26][27]. Additionally, bank efficiencies, return on assets, loan to assets, provision for loan losses, bank size, and non-interest income have been highlighted as important factors in managing NPLs[28]. These findings provide valuable insights for policymakers and financial institutions in managing NPLs and ensuring financial stability.

2.1.4. Loan-to-Deposit Ratio (LTD)

The LTD Ratio is a critical metric influencing bank performance, particularly in commercial, savings, and Islamic banks. Studies have shown that the LDR significantly impacts profitability and financial health. In Vietnam, research indicates that a higher LTD ratio can enhance profitability by increasing ROA, although it also raises the importance of effective NIM

management[29].

Similarly, studies on Malaysian banks suggest that LDR positively affects ROA and can influence stock returns, underscoring its role in strategic financial management[7]. Research in Taiwan corroborates these findings, highlighting that while LDR can boost profitability, it requires careful balancing against factors like capital adequacy and liquidity risk to optimize bank performance[8][24]. Effective management of the LDR is crucial for maintaining bank stability and profitability.

2.2. Comparative Analysis of Commercial, Savings, and Islamic Banks

Commercial banks and savings banks differ in several key aspects, including their business models, ownership structures, and risk profiles. Commercial banks typically offer a wider range of services beyond retail banking, such as corporate banking, investment banking, and wealth management. They are often shareholder-owned and profit-driven, with a higher risk appetite due to their involvement in more complex financial activities[30][31]. In contrast, savings banks traditionally focus more on retail banking, particularly deposit-taking and residential mortgage lending. They can be mutually-owned or publicly traded, with a greater emphasis on serving their local communities and a more conservative risk profile[32][33][34]. Studies have shown that during the global financial crisis, savings banks performed better than commercial banks due to their more traditional business models and lower risk exposures[35][36][37].

The operational characteristics and performance metrics of commercial banks, savings banks, and Islamic banks exhibit notable variations. Commercial banks primarily provide a wide range of services, including loans, deposits, and other financial services to individuals and businesses. They focus on maximizing shareholder value, often resulting in higher risk-taking and profitability[38][39]. Studies have shown that commercial banks often achieve higher ROA due to their diversified operations and aggressive asset management strategies[39][40]. In contrast, savings banks are more focused on accepting savings deposits and providing mortgage and consumer loans. They generally adopt a conservative approach to asset acquisition, leading to lower risk profiles[33][34]. Savings banks tend to have lower ROA compared to commercial banks, reflecting their cautious asset management and focus on stability over profitability[36][37].

Islamic banks operate under a distinct framework compared to conventional commercial banks. They follow Sharia principles, which prohibit interest (riba) and engage in profit-loss sharing arrangements[41][42][43]. As a result, Islamic banks offer Sharia-compliant products like Murabaha (cost-plus financing), Ijara (leasing), and Musharaka (equity participation), rather than traditional products like loans, mortgages, and credit cards[41][42][44]. Islamic banks face unique risks, such as Sharia non-compliance risk and equity investment risk, due to their profit-sharing model, as opposed to commercial banks' primary focus on credit, market, and operational risks[45][46][47]. Studies have shown mixed results when comparing the financial performance of Islamic and conventional banks, with some finding no significant difference and others finding Islamic banks to be more profitable or less risky[48][49][50][51]. Within the Islamic banking sector, a comparative analysis between Islamic commercial banks (BUS) and Islamic business units (UUS) within conventional banks in Indonesia revealed differences in liquidity risk, operational risk, and credit risk[52][53][54].

2.3. Regulatory Landscapes Shaping Banking Sectors

The regulatory landscape plays a pivotal role in shaping the operations, stability, and development of the banking sectors in Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam. These countries have implemented diverse regulatory frameworks tailored to their unique economic needs and financial systems. Below, the regulatory approaches in each of these countries will be discussed individually.

2.3.1. Hong Kong

The regulatory landscape in Hong Kong is shaped by a robust framework aimed at maintaining financial stability and fostering innovation while ensuring compliance with international standards. A key aspect of the regulatory environment is the emphasis on financial stability and the implementation of Basel III reforms. The Hong Kong Monetary Authority (HKMA) has been instrumental in strengthening bank balance sheets and improving the resilience of the banking sector through the Basel III framework[55]. This approach allows for the release of capital and liquidity reserves during times of market stress, enhancing the stability of banks during financial turbulence, as seen during the 2008-09 global financial crisis and the COVID-19 pandemic[56].

Additionally, Hong Kong's regulatory environment has embraced innovative approaches to address emerging challenges. The HKMA's Operational Resilience (OR-2) framework, effective from May 2023, requires banks to demonstrate their ability to maintain critical operations during disruptions, ensuring swift recovery and safeguarding customer interests[57]. Hong Kong is also positioning itself as a global hub for virtual assets and FinTech innovation, with comprehensive regulations for virtual asset service providers (VASPs) and intermediaries engaging in virtual asset-related activities. These regulations aim to balance innovation with investor protection and financial stability, reflecting Hong Kong's proactive stance in embracing blockchain and digital assets[55][58].

2.3.2. South Korea

South Korea's banking regulatory landscape is overseen by the Financial Services Commission (FSC) and the Financial Supervisory Service (FSS), the primary bodies responsible for rulemaking, licensing, oversight, and enforcement. Key regulatory requirements include maintaining stringent capital and liquidity ratios, such as the Capital Adequacy Ratio (CAR), Tier 1 Capital, Leverage Ratio, Liquidity Coverage Ratio (LCR), and Net Stable Funding Ratio (N.S.F.R.), to ensure financial stability and sufficient buffers against stress[59][60]. These ratios ensure that banks have adequate capital to cover risk-weighted assets, maintain substantial capital buffers against financial stress, limit excessive leverage, and have sufficient high-quality liquid assets and stable funding sources.

South Korea has also established a regulatory framework to support the growth of digital financial services and FinTech while ensuring consumer protection and financial stability. This includes the introduction of Regulatory Sandboxes, which allow FinTech companies to test innovative products in a controlled environment with reduced regulatory constraints, encouraging experimentation and innovation[61]. The Open Banking Framework mandates traditional banks to share customer data with authorized third-party providers, promoting competition and enhancing consumer access to diverse

financial services. Additionally, the FSC has a specialized division dedicated to overseeing FinTech development and streamlining regulations in this rapidly evolving sector[62].

2.3.3. Taiwan

Taiwan's regulatory framework for the banking sector focuses on promoting financial stability, fostering innovation, and ensuring compliance with international standards[63]. The regulatory landscape is designed to maintain a robust financial system through stringent capital and liquidity requirements, aligned with Basel III standards[m/**Deloitte2023?**/]. Banks are required to adhere to minimum capital adequacy ratios and maintain sufficient liquidity through ratios like the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR), ensuring their ability to withstand financial stress and maintain operational continuity.

Taiwan has also implemented a supportive regulatory framework for fintech innovation, including the Financial Technology Development and Innovative Experimentation Act, commonly known as the "Sandbox Act," which allows fintech companies to test new products and services in a controlled environment with regulatory oversight[m/**ICLG2023?**/]. Additionally, Taiwan has made significant strides in integrating Environmental, Social, and Governance (ESG) principles into its regulatory framework, with initiatives such as the Corporate Governance 3.0: Sustainable Development Roadmap and the Green Finance Action Plan 3.0, promoting transparency, sustainable business practices, and accountability for listed companies[64].

2.3.4. Malaysia

Malaysia's banking sector is governed by a comprehensive regulatory framework overseen by Bank Negara Malaysia (BNM), the central bank, and other relevant authorities. This framework aims to maintain financial stability, promote innovation, and ensure compliance with international standards and best practices[65]. Key areas of focus include capital and liquidity requirements aligned with the Basel III accord, corporate governance guidelines, and robust risk management practices[66].

In addition to conventional banking regulations, Malaysia has emerged as a global leader in Islamic finance. BNM plays a pivotal role in integrating Shariah principles into the financial sector, establishing comprehensive guidelines for Islamic banking operations under the Islamic Financial Services Act 2013[67]. This includes regulations governing products, services, and risk management processes that comply with Islamic law. The emphasis on ethical and sustainable financing has positioned Malaysia as a hub for Islamic finance, attracting international institutions and investments[68].

2.3.5. Vietnam

Vietnam's banking sector has undergone significant reforms as the country transitions from a centrally planned to a market-oriented economy[69]. The State Bank of Vietnam (SBV) is the primary regulator, responsible for maintaining monetary stability and overseeing the banking system. Key regulatory priorities include promoting financial inclusion, adopting international standards like Basel III, and encouraging digital transformation[70][71].

To drive digital innovation, the SBV has been granting licenses to digital-only banks and implementing regulatory sandboxes for fintech firms to test new products and services under a controlled environment[72]. Additionally, Vietnam enacted a comprehensive data protection law in 2023, the Decree on Personal Data Protection (No.13/2023/ND-CP), aligning its regulatory framework with global standards on data privacy and cybersecurity[73]. The new decree aims to enhance consumer trust and support the growth of Vietnam's digital economy by establishing clear guidelines for data processing, consent, and cross-border data transfers[74].

The regulatory landscapes across these countries have evolved to address unique regional challenges, economic conditions, and financial system characteristics. While adopting international best practices like the Basel Accords, each nation has tailored its regulatory approach to foster financial stability, promote sustainable development, embrace technological innovations, and cater to the specific needs of its banking sector. Table 1 summarizes the comparative analysis of the banking sectors across Vietnam, Malaysia, Hong Kong, South Korea, and Taiwan, delineating key differences in their regulatory reforms, adoption of international best practices, technological advancements, economic conditions, banking system structures, financial inclusion efforts, and regulatory priorities.

Category	Vietnam	Malaysia	Hong Kong	South Korea	Taiwan
Regulatory Reforms	Ongoing transition from centrally planned economy	Dual banking system (conventional and Islamic)	Mature banking system	Mature banking system	Political economy influences banking sector
International Best Practices	Adopted Basel Accords	Adopted Basel Accords	Adopted Basel Accords	Adopted Basel Accords	Adopted Basel Accords
Technological Advance-ments	Digital banking, fintech, and RegTech	Digital banking, fintech, and RegTech	Digital banking, fintech, and RegTech	Digital banking, fintech, and RegTech	Digital banking, fintech, and RegTech
Economic Conditions	Rapidly growing economy	Diversified economy	Highly dependent on international trade	Highly dependent on international trade	Diversified economy
Banking System	State-owned banks dominant	Dual banking system	International banks present	International banks present	Political economy influences banking sector
Financial Inclusion	Low financial inclusion	High financial inclusion (Islamic banking)	High financial inclusion	High financial inclusion	Traditional banking approach
Priorities	Enhancing financial inclusion and reducing poverty	Promoting Islamic banking and financial inclusion	Anti-money laundering and combating the financing of terrorism	Anti-money laundering and combating the financing of terrorism	Enhancing banking stability and resilience

Table 1. Comparative Analysis of Banking Sectors by Country

3. Research Gap

Despite the abundance of literature on bank performance, a significant research gap persists in the comparative analysis of financial performance metrics between commercial, savings, and Islamic banks across Hong Kong, South Korea, Taiwan, Vietnam, and Malaysia. While individual country studies and comparisons between conventional and Islamic banks are plentiful, a comprehensive cross-country comparison of these three bank types is lacking. Specifically, the existing literature fails to holistically examine the regulatory, economic, and institutional factors influencing Net Interest Margins (NIM), Return on Assets (ROA), Loan to Deposit ratio, and Non-Performing Loan (NPL) ratio across these five countries.

The absence of a comparative analysis of financial performance metrics between commercial, savings, and Islamic banks in these five countries is particularly noteworthy. Existing studies have primarily focused on individual performance metrics or comparisons between two bank types, neglecting the nuances and differences between commercial, savings, and

Islamic banks. Moreover, the impact of regulatory environments, macroeconomic conditions, and institutional characteristics on these performance metrics remains underexplored. By addressing these research gaps, this study aims to provide a comprehensive understanding of the differences in NIM, ROA, Loan to Deposit ratio, and NPL ratio between commercial, savings, and Islamic banks in Hong Kong, South Korea, Taiwan, Vietnam, and Malaysia.

3.1. Theoretical Framework - Resource Based View

The Resource-Based View (RBV) theory, first introduced by[75] and later elaborated by[76], provides a robust framework for understanding the performance disparities among commercial banks, savings banks, and Islamic banks. According to RBV, a bank's competitive advantage and superior performance originate from its ability to acquire, develop, and efficiently utilize valuable, rare, inimitable, and non-substitutable resources[77][78]. In the context of banking, these resources include advanced technological infrastructure, skilled human capital, robust risk management systems, strong customer relationships, localized knowledge, and adherence to Shariah principles[34][36][41].

Commercial banks, known for their diversified product offerings and aggressive growth strategies, leverage their advanced technological infrastructure and robust risk management systems to engage in complex financial transactions and achieve higher profitability through economies of scale and scope[79]. In contrast, savings banks derive their competitive advantage from strong customer relationships, localized knowledge, and conservative risk culture, enabling them to better serve their local communities and maintain financial stability[33]. Islamic banks, adhering to Shariah principles, utilize their unique resources, such as Shariah governance structures and expertise in Islamic finance, to cater to specific market segments and differentiate themselves from conventional banks, potentially leading to superior performance in certain contexts[49][50].

By applying the RBV theory, this study aims to analyze how the unique resources and capabilities of commercial, savings, and Islamic banks influence their key financial performance metrics, including Net Interest Margin (NIM), Return on Assets (ROA), Loan to Deposit (LTD) ratio, and Non-Performing Loan (NPL) ratio, across Hong Kong, South Korea, Taiwan, Vietnam, and Malaysia. This theoretical lens provides a comprehensive understanding of the heterogeneity in bank performance, attributing differences to the effective deployment and management of these unique resources within diverse regulatory, economic, and institutional environments[80][81]

3.2. Hypothesis Development

Building upon the comprehensive review of the literature, this study aims to empirically investigate the disparities in ROA between commercial banks, savings banks, and Islamic banks across different countries. The analysis will consider how various regulatory environments, economic conditions, and institutional characteristics influence these disparities. By examining these factors, the study seeks to provide insights into the broader implications of banking sector performance across diverse regional contexts. This investigation is structured around the following hypotheses:

- **H$_1$**: Commercial banks have a higher Return on Assets (ROA) compared to savings banks and Islamic banks across

Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam.

- H_2: Commercial banks have a lower Non-Performing Loan (NPL) ratio compared to savings banks and Islamic banks across Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam.

- H_3: Commercial banks have a higher Net Interest Margin (NIM) compared to savings banks and Islamic banks across Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam.

- H_4: Commercial banks have a higher Loan to Deposit (LTD) ratio compared to savings banks and Islamic banks across Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam.
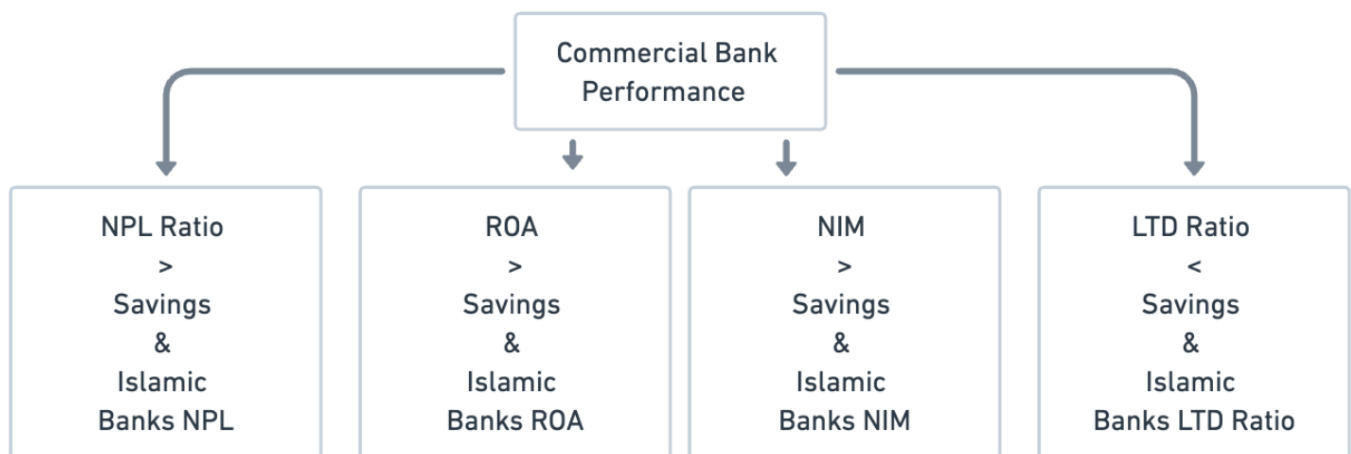
Figure 1. Hypothesis Visualized

4. Data and Methodology

4.1. Data Description

This study utilizes data sourced from the Bureau van Dijk's Orbis database, a comprehensive tool for verifying company existence and sourcing detailed company reports. The data collection period spans from 2010 to 2022, focusing on banks across five countries: Hong Kong, South Korea, Malaysia, Taiwan, and Vietnam. These countries were selected due to their diverse regulatory environments, economic conditions, and technological advancements, providing a rich context for examining the performance metrics of different types of banks. As shown in Table 2, the number of banks analyzed each year varies, reflecting changes in the banking landscape over time.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Banks	106	105	107	117	118	118	120	122	127	126	127	127	118

Table 2. Distribution of Banks by Year

The study encompasses a total of 1,628 bank observations, categorized into commercial, Islamic, and savings banks

(Table 3). Hong Kong and Vietnam primarily feature commercial bank observations, with 196 and 368, respectively. South Korea includes a mix of commercial (210) and savings bank observations (70). Malaysia has a distinctive presence of Islamic bank observations (42) alongside its commercial bank observations (126), while Taiwan's banking sector is predominantly commercial with a small proportion of savings bank observations (28).

Country	Total	Commercial	Islamic	Savings	Percent	Cum.
Hong Kong (HK)	196	196	0	0	12.04	12.04
South Korea (KR)	280	210	0	70	17.20	29.24
Malaysia (MY)	168	126	42	0	10.32	39.56
Taiwan (TW)	616	588	0	28	37.84	77.40
Vietnam (VN)	368	368	0	0	22.60	100.00
Total	1,628	1,488	42	98	100.00	

Table 3. Distribution of Bank Specialization by Country

The descriptive statistics of the four performance indicators across the five markets, as shown in Table 4, highlight distinct patterns. Hong Kong exhibits significant variability in its Net Interest Margin (NIM) and ROA, indicating wide-ranging profitability and interest margins among its banks. South Korea shows more consistent performance with moderate NIM (mean = 1.478) and ROA (mean = 2.162), but higher variability in its Non-Performing Loan (NPL) ratio, suggesting varying levels of loan quality. Malaysia features a notable presence of Islamic banks, reflected in its relatively high NIM (mean = 2.500) and diverse ROA figures. Taiwan's banking sector, while demonstrating stable but low profitability (mean ROA = 0.007), shows minimal variation in its NPL ratio and Loan to Deposit (LTD) ratio, suggesting robust asset quality and liquidity management. In contrast, Vietnam presents a high NPL ratio (mean = 13.648), indicating substantial credit risk, alongside a negative mean NIM (-8.082) and lower yet varied ROA, highlighting challenges in profitability and interest income. These differences underscore the diverse banking environments and challenges faced by banks across these regions.

Country	Variable	Mean	SD	Min	Max	Q1	Median	Q3
HK	Net Interest Margin	0.135	54.578	-446.528	252.466	-0.682	-0.083	2.280
	ROA	7.970	20.660	0.050	129.985	0.756	1.065	2.538
	NPL Ratio	2.372	13.393	-80.124	78.564	0.343	0.820	1.597
	Loan To Deposit Ratio	3.847	12.574	0.064	88.331	0.702	0.804	0.899
KR	Net Interest Margin	1.478	7.420	-20.690	50.064	-0.799	1.026	1.640
	ROA	2.162	6.915	-1.219	47.972	0.432	0.573	0.760
	NPL Ratio	3.052	9.583	-33.433	65.456	0.445	0.787	2.859
	Loan To Deposit Ratio	1.758	3.100	0.019	18.996	0.961	0.990	1.047
MY	Net Interest Margin	2.500	34.652	-104.511	270.771	-1.289	0.223	2.828
	ROA	3.911	17.010	0.014	123.408	0.569	0.946	1.179
	NPL Ratio	2.250	10.989	-66.181	58.338	0.053	0.872	3.086
	Loan To Deposit Ratio	7.992	25.094	0.068	165.714	0.844	0.923	1.113
TW	Net Interest Margin	-0.003	0.004	-0.009	0.016	-0.005	-0.004	-0.002
	ROA	0.007	0.004	-0.008	0.022	0.004	0.006	0.008
	NPL Ratio	0.002	0.003	-0.002	0.022	0.001	0.002	0.003
	Loan To Deposit Ratio	0.746	0.078	0.588	0.973	0.680	0.741	0.796
VN	Net Interest Margin	-8.082	16.341	-46.428	3.467	-3.460	-1.604	-0.305
	ROA	1.792	1.019	0.140	3.238	0.824	1.819	2.626
	NPL Ratio	13.648	19.748	0.799	50.270	0.922	3.050	31.500
	Loan To Deposit Ratio	2.969	4.805	0.079	14.691	0.872	0.960	1.246
Total	Net Interest Margin	0.681	30.399	-446.528	270.771	-0.494	-0.003	1.352
	ROA	3.187	13.223	-1.219	129.985	0.009	0.550	1.095
	NPL Ratio	2.075	10.047	-80.124	78.564	0.002	0.415	1.391
	Loan To Deposit Ratio	3.234	13.153	0.019	165.714	0.722	0.852	0.984

Table 4. Distribution of Bank Performance Variable by Country

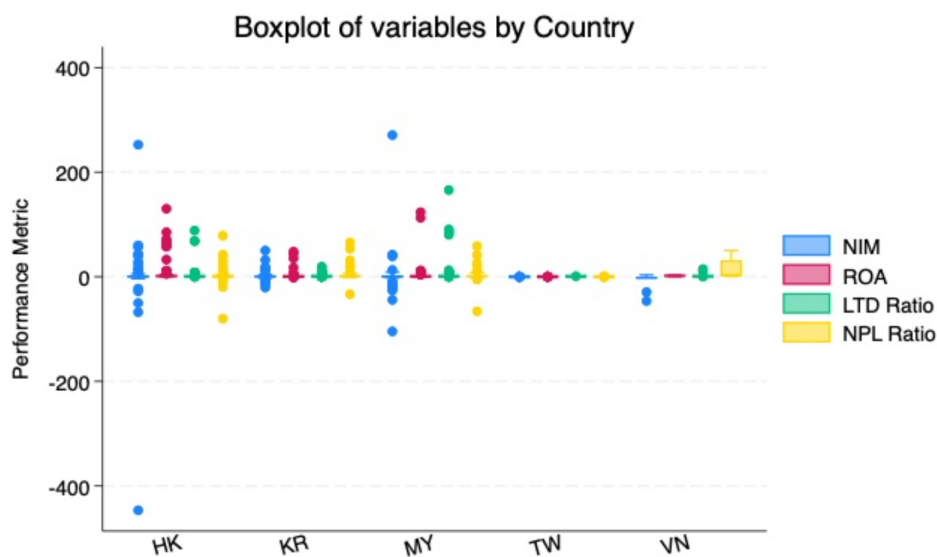*Note: Hong Kong is denoted as (HK), South Korea as (KR), Malaysia (MY), Taiwan (TW), and Vietnam (VN).*

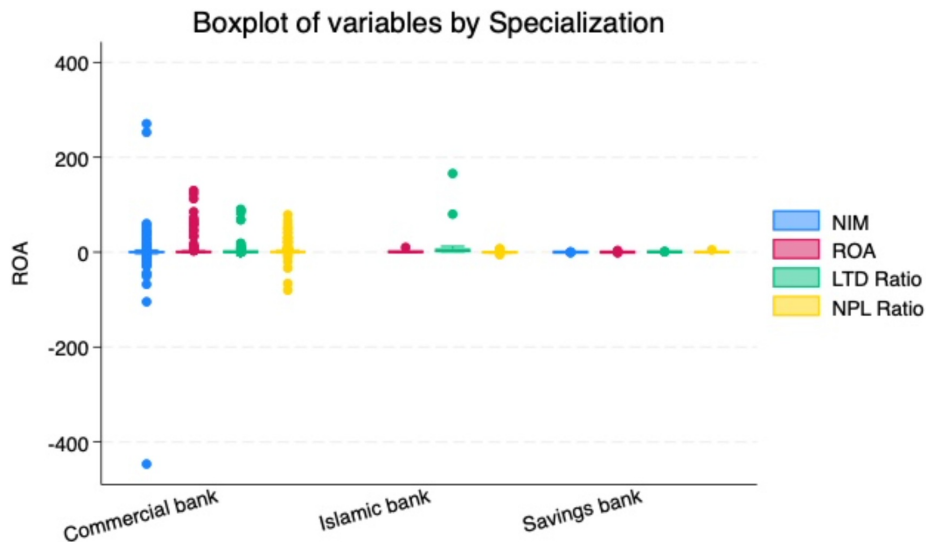**Figure 2.** Key variables by Country

Figure 3. Key variables by Specialization

The variables in this study are detailed in Table 5. Dependent variables include Net Interest Margin (NIM), Return on Assets (ROA), Non-Performing Loans (NPL), and Loan to Deposit Ratio (LTD), all calculated from Orbis data. Independent variables consist of Tier 1 Leverage Ratio, Debt to Equity Ratio, Efficiency Ratio, Log of Total Equity, and Log of Total Assets, also from Orbis. Regulatory controls, such as Rule of Law, Government Effectiveness, Voice and Accountability, and Regulatory Quality, are sourced from the World Governance Indicators. Macro controls, including GDP and CPI from the World Bank, provide essential insights into the overall economic health and stability of a country[82]. Specialization dummy variables for Savings Banks and Islamic Banks are based on Orbis data. This comprehensive set of variables ensures a thorough analysis of bank performance across different specializations and countries. The descriptive statistics of control variables in Table 6 provide a comprehensive overview of various bank characteristics, regulatory characteristics, and macro characteristics across different entities. Key bank characteristics include the Leverage Ratio, Debt to Equity Ratio, Efficiency Ratio, and logarithmic values of Total Equity and Total Assets. Regulatory characteristics, which are crucial indicators from the World Governance Indicators (WGI) project, assess dimensions such as Rule of Law, Government Effectiveness, Voice and Accountability, and Regulatory Quality. The macro characteristics are represented by GDP and CPI, which offer insights into the economic environment. This table facilitates a better understanding of the distribution and variation of these control variables, highlighting the central tendency, dispersion, and range of values observed in the dataset.

Table 5. List of Proposed Variables

Type	Variable	Code	Expected Sign	Data Source
Dependent variable				
	Net Interest Margin	NIM		Calculated
	Return on Assets	ROA		Calculated
	Non Performing Loans	NPL		Calculated
	Loan to Deposit Ratio	LTD		Calculated
Independent variable				
	Tier 1 Leverage Ratio	Leverage Ratio	-	Calculated
	Debt to Equity Ratio	Debt/Equity	-	Calculated
	Efficiency Ratio	Eff Ratio	-	Calculated
	Log of Total Equity	L. Equity	+	Calculated
	Log of Total Assets	L. Assets	+	Calculated
Regulatory Controls				
	Rule of Law	RuleLaw	+	World Governance Indicators
	Government Effectiveness	GovEff	+	World Governance Indicators
	Voice and Accountability	VoiceAcct	+	World Governance Indicators
	Regulatory Quality	RegQual	+	World Governance Indicators
Macro Conrols				
	Gross Domestic Product	GDP	+	World Bank
	Consumer Price Index	CPI	-	World Bank
Specialization Dummy				
	Savings Banks	Savings Banks		BvD Orbis
	Islamic Banks	Islamic Banks		BvD Orbis

Note: Commercial bank is the default category, with Savings Banks and Islamic Banks represented as dummy variables.

Table 6. Descriptive Statistics of Control Variables

Variable	Mean	SD	Min	Max	Q1	p50	Q3
Bank Characteristics							
Leverage Ratio	2.069	9.752	-0.545	126.721	0.087	0.729	1.070
Debt to Equity Ratio	8.362	43.149	-1.936	891.763	0.913	1.304	10.465
Efficiency Ratio	2.95e+14	1.43e+15	20.167	8.95e+15	77.859	4.01e+07	5.63e+07
Log of Total Equity	13.589	0.488	12.920	15.954	13.267	13.448	13.788
Log of Total Assets	12.404	3.133	6.596	15.995	8.110	14.290	14.533
Regulatory Characteristics							
Rule of Law	1.071	0.446	-0.580	1.860	0.900	1.130	1.260
Government Effectiveness	1.284	0.347	-0.240	1.880	1.030	1.320	1.490
Voice and Accountability	0.459	0.572	-1.500	1.100	-0.050	0.680	0.900
Regulatory Quality	1.234	0.532	-0.630	2.220	0.990	1.150	1.470
Macro Characteristics							
GDP	5.34e+11	6.08e+11	0.444	1.69e+12	0.744	3.16e+11	1.31e+12
CPI	112.792	15.257	89.270	171.880	99.000	113.051	120.663

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. NIM	1.000													
2. ROA	0.083	1.000												
3. NPL	-0.397	-0.060	1.000											
4. LTD	0.095	-0.056	-0.112	1.000										
5. Lev Ratio	0.206	0.031	-0.060	-0.110	1.000									
6. D/E Ratio	0.001	0.077	-0.033	-0.097	-0.187	1.000								
7. Eff Ratio	0.218	0.120	0.117	0.060	0.160	-0.255	1.000							
8. L. Equity	0.346	-0.190	-0.247	0.112	-0.046	-0.563*	-0.019	1.000						
9. L. Assets	0.148	0.163	0.104	0.078	0.181	-0.390*	0.665*	0.718*	1.000					
10. RuleLaw	-0.262	-0.290	-0.069	-0.108	-0.201	0.055	-0.074	0.100	-0.360*	1.000				
11. GovEff	-0.217	-0.299	-0.095	-0.049	-0.221	0.032	-0.031	0.095	-0.326	0.978*	1.000			
12. VoiceAcct	-0.265	-0.284	-0.002	-0.142	-0.184	0.100	-0.148	0.046	-0.458*	0.982*	0.935*	1.000		
13. RegQual	-0.243	-0.296	-0.119	-0.079	-0.224	0.060	-0.081	0.123	-0.370*	0.993*	0.990*	0.960*	1.000	
14. GDP	-0.226	-0.073	0.278	-0.119	0.088	-0.223	0.370*	-0.076	0.356*	0.296*	0.262	0.291*	0.215	1.000
15. CPI		0.180	0.135	0.108	0.213	-0.409*	0.663*		0.985*	-0.595*	-0.527*	-0.676*	-0.602*	0.430*

Table 7. Correlation Matrix of Variables

*Notes: * indicates significance at the 0.01 level.*

The correlation matrix in Table 7 illustrates the relationships between the variables, with significant correlations marked to indicate their statistical relevance. This detailed examination helps identify key interdependencies and potential multicollinearity issues in the analysis. Table 8 presents the results of Fisher-type unit-root tests and Variance Inflation Factor (VIF) values for the four performance ratios. Both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests consistently indicate stationarity across all variables with significant p-values, while the VIF values indicate low multicollinearity among the predictor variables. The tests are conducted against the four main dependent variables: NIM, ROA, NPL, and LTD.

Variable	Test	Inverse χ^2	p-value	VIF					
				L. Equity	L. Assets	Debt/Equity	Lev Ratio	Eff Ratio	Mean VIF
NIM	ADF	1328.4069	0.0000	8.07	8.07	1.01	1.01	1.01	3.83
	PP	899.5728	0.0000						
ROA	ADF	1089.6923	0.0000	8.07	8.07	1.01	1.01	1.01	3.83
	PP	998.1753	0.0000						
NPL	ADF	1238.3725	0.0000	7.52	7.52	1.01	1.01	1.01	3.61
	PP	1163.5301	0.0000						
LTD	ADF	1111.4432	0.0000	8.07	8.07	1.01	1.01	1.01	3.83
	PP	1045.8993	0.0000						

Table 8. Fisher-type Unit-root Tests and VIF Values

Notes: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests check for unit roots. Variance Inflation Factor (VIF) measures multi-collinearity.

5. Empirical Results and Discussion

This paper employs random effects (RE) regression to test the performance metrics between commercial banks, savings banks, and Islamic banks across five countries: Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam. The choice of using random effects regression is grounded in its ability to account for unobserved heterogeneity when the unobserved individual effects are assumed to be uncorrelated with the independent variables. This model is particularly useful in hierarchical linear models, capturing more realism in the system by accounting for correlated structures and uncertainty[83]. Random effects models offer more efficient estimators than fixed effects models when this assumption holds[84]. To validate the appropriateness of the random effects model, we conducted a Hausman test, which yielded a p-value of 0.7550, indicating no systematic difference between the coefficients estimated by the fixed effects and random effects models, thus supporting the suitability of the random effects regression model for our analysis. This approach follows established practices in the literature, with[83] highlighting the utility of random effects models in capturing both individual-level and group-level variations and[85] emphasizing the importance of selecting random effects models based on the specific research question and data characteristics. By using random effects regression, we aim to provide a detailed comparison of financial performance metrics across different types of banks in diverse economic environments, offering valuable insights into the dynamics of banking performance across the studied regions.

The regression results indicate distinct performance differences among the types of banks with respect to NIM, ROA, NPL, and LTD. For NIM, the coefficients suggest that savings banks have a positive coefficient (2.0952), though not statistically significant, compared to commercial banks, while Islamic banks show a negative but insignificant coefficient (-1.7039). In terms of ROA, the leverage ratio exhibits a significant positive relationship (coefficient = 0.2099), indicating higher leverage correlates with better asset returns, particularly in commercial banks. The NPL ratio, a critical indicator of loan performance, shows higher values for savings banks (coefficient = 8.4576), although not statistically significant, pointing to potential differences in risk management practices. Lastly, the LTD ratio is significantly influenced by the efficiency ratio (coefficient = 0.0000), highlighting that better operational efficiency is associated with higher LTD ratios. Control variables such as debt-to-equity ratio, size (log equity and log assets), and governance indicators provide

additional context, demonstrating varying effects across different models. Notably, the rule of law shows a significant positive relationship with the LTD ratio (coefficient = 165.0092), suggesting that stronger legal frameworks enhance banks' loan-to-deposit performance.

The results reveal distinct differences in financial performance metrics like NIM, ROA, NPL, and LTD when comparing commercial banks to savings and Islamic banks. Savings banks tend to have higher NPL ratios, indicating potential challenges in loan performance, while commercial banks benefit from higher leverage in terms of ROA. Islamic banks, while showing lower coefficients for NIM and ROA, also highlight the distinctive operational framework influenced by Sharia-compliant financial principles, which may impact profitability metrics differently. Additionally, the efficiency ratio plays a crucial role in determining LTD ratios across all bank types, emphasizing the importance of operational efficiency.

	NIM		ROA		NPL Ratio		LTD Ratio	
Variable	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
Leverage Ratio	0.0097	(0.13)	0.2099***	(2.79)	-0.1078	(-0.40)	-0.5904	(-0.26)
Debt to Equity Ratio	-0.0156	(-0.51)	-0.0238	(-0.80)	0.0114	(0.11)	-0.1284	(-0.14)
Efficiency Ratio	0.0000	(0.35)	0.0000	(0.20)	0.0000	(-0.53)	0.0000***	(4.71)
Lg. Equity	-0.1108	(-0.13)	0.3157	(0.39)	-1.8385	(-0.65)	-4.5373	(-0.19)
Lg. Assets	0.6780	(0.71)	-1.3075	(-1.33)	1.9031	(0.61)	2.3401	(0.09)
Rule of Law	1.1465	(0.47)	-0.1057	(-0.04)	1.3752	(0.17)	165.0092**	(2.37)
Gov Eff	-1.9930	(-0.70)	-1.6706	(-0.60)	-5.7436	(-0.59)	-18.1299	(-0.22)
Voice Acct	-2.5046	(-1.36)	-2.5409	(-1.40)	0.8776	(0.14)	20.5919	(0.38)
Reg Qual	2.5772	(1.02)	3.5250	(1.42)	1.9322	(0.21)	-130.5516*	(-1.71)
GDP	-0.0000	(-0.26)	0.0000	(0.05)	0.0000	(0.70)	-0.0000	(-1.20)
CPI	-0.0017	(-0.15)	-0.0010	(-0.09)	-0.0081	(-0.21)	0.1908	(0.56)
Islamic Bank	-1.7039	(-0.74)	-1.2067	(-0.45)	-1.3832	(-0.22)	7.0420	(0.14)
Savings Bank	2.0952	(1.03)	2.1429	(0.90)	8.4576	(1.47)	1.5879	(0.03)
_cons	-6.0612	(-0.94)	14.9087***	(2.08)	3.8462	(0.20)	39.4065	(0.25)
Obs / Groups	749 / 82		749 / 82		728 / 82		749 / 82	
R^2 (W / B / O)	0.0054 / 0.1216 / 0.0226		0.0349 / 0.0310 / 0.0226		0.0001 / 0.1592 / 0.0145		0.0428 / 0.0335 / 0.0419	
σ_u / σ_e / ρ	2.6500 / 8.1164 / 0.0963		3.5876 / 7.7675 / 0.1758		0 / 28.9754 / 0		0 / 251.2344 / 0	

Table 9. Random-effects GLS Regression Results

Notes: R^2 (W/B/O) represents Within (W), Between (B), and Overall (O) R-squared values.

5.1. Robustness Check - Dynamic Panel-Data Estimation, Two-Step System GMM

This paper additionally employs the Dynamic Panel-Data Estimation, Two-Step System GMM (2SGMM) approach to compare the financial performance of commercial banks, savings banks, and Islamic banks across five countries. The choice of using the 2SGMM is grounded in its ability to account for unobserved heterogeneity, endogeneity, and dynamics in panel data[86][87]. This method is particularly useful for addressing potential biases and inconsistencies in the data, providing robust and efficient estimates[88]. By utilizing this methodology, this research aims to effectively compare the performance metrics of NIM, ROA, NPL, and LTD across different bank types and countries, while controlling for individual bank-specific effects and time-invariant factors.

The comparison of financial performance metrics using the 2SGMM and RE regression reveals both congruences and

discrepancies. For NIM, both methods indicate that savings banks have a positive but insignificant coefficient (2SGMM: 0.7794; RE: 2.0952), while Islamic banks have a negative but insignificant coefficient (2SGMM: -0.6161; RE: -1.7039). The inclusion of dynamic relationships in the 2SGMM model provides additional robustness to these findings.

Regarding ROA, the RE model shows a significant positive relationship with the leverage ratio (coefficient = 0.2099), while the 2SGMM model does not find this relationship significant (coefficient = 0.1041). This suggests that the 2SGMM approach better accounts for the dynamics and potential endogeneity in the data. For the NPL ratio, both models show higher but insignificant values for savings banks (2SGMM: 6.8273; RE: 8.4576), and Islamic banks have an insignificant impact (2SGMM: 0.0876; RE: not significant).

In terms of the LTD ratio, both methods identify a significant positive relationship with the rule of law (2SGMM: 103.4142**; RE: 165.0092), highlighting the importance of legal frameworks. The efficiency ratio remains a significant factor in the 2SGMM model (coefficient = 0.0000), similar to the RE findings. Control variables reveal additional insights, with the 2SGMM results indicating significant negative effects of government effectiveness on ROA (coefficient = -3.9132***) and regulatory quality on the LTD ratio (coefficient = -88.2497**).

The 2SGMM approach validates and extends the RE results by addressing unobserved heterogeneity, endogeneity, and dynamics in the data. This comprehensive analysis enhances the understanding of financial performance metrics for commercial, savings, and Islamic banks across the studied countries. Further analysis will follow on select individual countries.

	NIM		ROA		NPL Ratio		LTD Ratio	
Variable	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
Lag.Dependent	-0.0022	(-0.11)	0.0000	(0.44)	-0.0124	(-0.84)	0.0045	(0.55)
Leverage Ratio	0.0639	(1.02)	0.1041	(0.47)	-0.0767	(-1.80)	0.0538	(0.12)
Debt to Equity Ratio	-0.0012	(-0.10)	-0.0147	(-1.12)	-0.0359	(-1.38)	-0.0446	(-0.44)
Efficiency Ratio	0.0000	(0.64)	0.0000	(-0.45)	-0.0000	(-0.53)	0.0000	(1.43)
Lg. Equity	0.2320	(0.30)	-0.2050	(-0.27)	-1.5217	(-1.01)	-1.9867	(-0.30)
Lg. Assets	0.3133	(0.40)	0.0339	(0.03)	2.0164	(1.36)	0.7193	(0.07)
Rule of Law	3.3348	(1.50)	0.0845	(0.05)	-0.1919	(-0.03)	103.4142**	(2.15)
Gov Eff	-2.0748	(-0.83)	-3.9132***	(-2.76)	-8.3715	(-0.84)	-3.8331	(-0.26)
Voice Acct	0.0081	(0.00)	-0.1540	(-0.13)	0.2195	(0.08)	15.8560	(1.15)
Reg Qual	-1.5449	(-0.71)	2.7485	(1.79)	5.9235	(0.93)	-88.2497**	(-2.06)
GDP	-1.15e-12	(-0.64)	2.13e-13	(0.36)	1.52e-12	(0.69)	-3.35e-11	(-1.82)
CPI	0.0079	(0.84)	-0.0021	(-0.49)	0.0113	(0.69)	0.1684	(1.60)
Islamic Bank	-0.6161	(-1.05)	-0.4122	(-0.53)	0.0876	(0.04)	15.3686	(1.54)
Savings Bank	0.7794	(0.52)	0.8310	(0.46)	6.8273	(0.89)	1.7165	(0.17)
_cons	-5.1530**	(-1.97)	5.3462	(0.50)	-4.1501	(-0.89)	16.3103	(0.19)
Obs / Groups / Instruments	705 / 82 / 26		672 / 82 / 26		640 / 82 / 26		672 / 82 / 26	
Wald χ^2	129.12		1645.42		27.46		18.87	
Prob > χ^2	0.000		0.000		0.000		0.001	
AR(1)	-3.91***		-2.39**		-3.08***		-1.03	
AR(2)	0.25		-1.31		0.52		-0.77	
Sargan test	15.56		2.56		3.63		0.73	
Hansen test	11.55		13.14		12.35		3.69	
Difference-in-Hansen test	$\chi^2(1) = 0.14$		$\chi^2(1) = 2.42$		$\chi^2(1) = 3.32$		$\chi^2(1) = 0.62$	

Table 10. Dynamic Panel-Data Estimation, Two-Step System GMM

Notes: ** p ¡ 0.05, *** p ¡ 0.01.

5.2. Focused Country Analysis

Further analysis focuses on two individual countries, specifically South Korea, which has a large number of savings and commercial banks, and Malaysia, where there is a significant number of Islamic banks. This section examines the performance metrics of NIM, ROA, NPL, and LTD within these countries, comparing savings banks and commercial banks in South Korea, and commercial banks and Islamic banks in Malaysia. Both the RE regression and the 2SGMM approach are employed to ensure robustness and address potential biases, providing a comprehensive understanding of the financial dynamics in these diverse banking environments. The results for Malaysia are presented in Table 12, and the results for South Korea are presented in Table 11.

In South Korea, the analysis highlights notable performance differences between commercial banks and savings banks across several financial metrics. For NIM, savings banks exhibit a positive but statistically insignificant coefficient, suggesting marginally better net interest margins compared to commercial banks. Similarly, the analysis for ROA shows that savings banks have higher coefficients, indicating potentially higher returns on assets, although these results are not statistically significant. In terms of NPL ratios, savings banks also display higher coefficients, pointing to greater non-performing loans compared to their commercial counterparts, but these findings lack statistical significance. For LTD ratios, the results show minor differences between the two bank types, with savings banks exhibiting slightly lower coefficients. These findings suggest that while savings banks may offer marginally better net interest margins and returns on assets, they also face higher risks in terms of non-performing loans.

Turning to Malaysia, the performance comparison between commercial banks and Islamic banks reveals distinctive patterns across various financial metrics. For NIM, Islamic banks exhibit negative coefficients, suggesting lower net interest margins compared to commercial banks, though these differences are not statistically significant. The analysis of ROA shows that Islamic banks tend to have lower returns on assets, as indicated by the negative coefficients, reflecting potentially different profit-generation mechanisms compared to commercial banks. Regarding NPL ratios, Islamic banks demonstrate lower coefficients, which may indicate more prudent loan management and lower levels of non-performing loans compared to commercial banks. However, these results are not statistically significant. Lastly, in terms of LTD ratios, Islamic banks display higher coefficients, suggesting a higher ratio of loans to deposits, which may reflect their operational strategies and customer base characteristics. These findings suggest that Islamic banks prioritize loan management and maintain higher liquidity, reflecting their operational focus and customer base.

	NIM		ROA		NPL		LTD	
	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
Random Effects								
Leverage Ratio	-0.5704	(-0.92)	-0.5861	(-0.83)	-3.0373	(-0.51)	0.3321	(0.36)
Debt to Equity Ratio	0.0081	(0.17)	-0.0159	(-0.29)	-0.0292	(-0.07)	-0.0054	(-0.07)
Efficiency Ratio	-1.46e-16	(-0.57)	-1.09e-16	(-0.38)	9.22e-17	(0.04)	-1.02e-16	(-0.26)
Lg. Equity	-1.0825	(-0.77)	-1.6875	(-1.07)	-6.6154	(-0.54)	1.3086	(0.61)
Lg. Assets	1.4034	(0.50)	2.5946	(0.80)	-11.9639	(-0.48)	-3.1685	(-0.78)
Rule of Law	-5.3700	(-0.59)	-22.6699	(-2.23)	85.7815	(1.02)	-1.3086	(-0.09)
Gov Eff	-11.4226	(-1.55)	-0.8330	(-0.10)	20.8136	(0.31)	-21.3746	(-1.87)
Voice Acct	13.2487	(1.25)	-16.1435	(-1.37)	88.8749	(0.95)	10.2533	(0.62)
Reg Qual	4.6526	(0.39)	-1.4854	(-0.11)	112.5956	(1.00)	-32.2282	(-1.73)
GDP	1.35e-11	(0.60)	3.10e-11	(1.25)	-3.44e-10	(-1.69)	3.95e-11	(1.14)
CPI	-0.2085	(-0.64)	-0.4539	(-1.25)	5.0441	(1.70)	-0.5818	(-1.15)
Savings Bank	2.2326	(1.15)	2.7817	(0.89)	8.4065	(0.64)	-0.6306	(-0.30)
_cons	3.1084	(0.08)	28.4320	(0.62)	-68.7043	(-0.19)	88.6023	(1.54)
Obs / Groups	176 / 19		176 / 19		162 / 19		176 / 19	
R^2 (W / B / O)	0.0380 / 0.1183 / 0.0454		0.0633 / 0.2118 / 0.0737		0.0423 / 0.0466 / 0.0382		0.0354 / 0.1458 / 0.0385	
σ_u / σ_e / ρ	2.7469 / 6.5666 / 0.1489		5.3196 / 7.3243 / 0.3453		9.9743 / 58.6770 / 0.0281		1.2711 / 10.1478 / 0.0154	
SGMM								
Lag Dependent	0.0135	(0.43)	0.0111	(0.31)	-0.0011	(-0.06)	0.0202	(0.76)
Leverage Ratio	-1.0649	(-1.10)	-0.3869	(-0.75)	-1.0832	(-0.25)	0.4946	(0.77)
Debt to Equity Ratio	0.0096	(1.11)	-0.0036	(-0.31)	0.0705	(0.59)	-0.0357	(-1.56)
Efficiency Ratio	-0.0000	(-0.27)	-0.0000	(-0.89)	0.0000	(0.23)	-0.0000	(-1.24)
Lg. Equity	-1.5221	(-1.25)	-1.1922	(-1.48)	-0.0546	(-0.01)	-1.0682	(-0.65)
Lg. Assets	0.2150	(0.05)	-2.0983	(-0.62)	-31.3364	(-0.53)	7.3109	(1.03)
Rule of Law	-24.5508	(-0.86)	-17.9326	(-0.84)	13.7620	(0.92)	5.7563	(0.38)
Gov Eff	-5.8520	(-0.45)	-15.7477	(-1.67)	-61.8180	(-1.25)	5.3923	(0.37)
Voice Acct	17.8108	(1.09)	0.1279	(0.02)	103.9748	(1.67)	-10.5652	(-1.13)
Reg Qual	30.7265	(0.61)	-14.0793	(-0.69)	8.8607	(0.25)	13.9958	(0.39)
GDP	0.0000	(0.22)	0.0000	(0.99)	0.0000	(0.63)	-0.0000	(-0.39)
CPI	-0.0794	(-0.18)	-0.7607	(-0.99)	-0.4702	(-0.52)	0.3182	(0.38)
Savings Bank	2.3807	(1.53)	1.3197	(0.92)	4.0554	(0.37)	0.0988	(0.11)
_cons	6.5630	(0.12)	106.0159	(1.23)	422.3221	(0.54)	-110.7791	(-1.05)
Obs / Groups / Instruments	165 / 19 / 25		158 / 19 / 25		139 / 19 / 25		158 / 19 / 25	
Wald χ^2	46.51		141.30		10.03		22.87	
Prob > χ^2	0.000		0.000		0.018		0.000	
AR(1)	-2.64***		-1.72		-1.42		-1.20	
AR(2)	0.88		-0.24		-1.22		-0.66	
Sargan test	9.89		3.01		1.62		1.21	
Hansen test	2.86		1.47		4.25		2.68	
Difference-in-Hansen test	$\chi^2(1) = 1.00$		$\chi^2(1) = -0.07$		$\chi^2(1) = 0.61$		$\chi^2(1) = 0.74$	

Table 11. Country Focuses Analysis - South Korea

*Notes: ** $p < 0.05$, *** $p < 0.01$. R^2 (W/B/O) represents Within (W), Between (B), and Overall (O) R-squared values.*

	NIM		ROA		NPL		LTD	
	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic	Coefficient	z-statistic
Random Effects								
Leverage Ratio	0.0279	(0.12)	0.6220	(2.94)	-0.0916	(-0.20)	2.6623	(3.11)
Debt to Equity Ratio	0.0065	(0.15)	-0.0159	(-0.40)	0.0760	(1.04)	-0.0171	(-0.11)
Efficiency Ratio	-3.87e-17	(-0.10)	-1.98e-16	(-0.53)	9.03e-17	(0.11)	1.67e-15	(1.11)
Lg. Equity	1.8310	(0.95)	-0.1378	(-0.08)	-0.0610	(-0.02)	2.8541	(0.39)
Lg. Assets	-0.8391	(-0.30)	-1.9145	(-0.72)	-0.9873	(-0.19)	-1.9527	(-0.18)
Rule of Law	2.0949	(0.12)	12.0639	(0.73)	-20.3247	(-0.65)	4.2251	(0.06)
Gov Eff	3.4869	(0.25)	-22.2655	(-1.72)	51.9866	(2.13)	-24.0869	(-0.46)
Voice Acct	-11.4042	(-0.54)	25.9458	(1.31)	-61.5716	(-1.66)	-15.6305	(-0.19)
Reg Qual	-4.0079	(-0.26)	12.2364	(0.83)	-21.4356	(-0.78)	-10.2590	(-0.17)
GDP	6.25e-11	(0.46)	-1.85e-10	(-1.44)	4.61e-10	(1.93)	1.46e-11	(0.03)
CPI	-0.2234	(-0.52)	0.5777	(1.45)	-1.4137	(-1.90)	-0.0511	(-0.03)
Islamic Bank	-0.7879	(-0.54)	-2.3203	(-1.70)	-1.8058	(-0.67)	1.7846	(0.32)
_cons	-9.5923	(-0.35)	37.9383	(1.48)	-9.3000	(-0.19)	15.9259	(0.15)
Obs / Groups	117 / 12		117 / 12		112 / 12		117 / 12	
R^2 (W / B / O)	0.0209 / 0.1765 / 0.0374		0.2191 / 0.1204 / 0.1710		0.0699 / 0.0611 / 0.0633		0.1804 / 0.2940 / 0.1820	
σ_u / σ_e / ρ	0 / 5.9075 / 0		0 / 5.2706 / 0		0 / 10.0144 / 0		0 / 21.4737 / 0	
SGMM								
Lag Dependent	0.2741	(0.34)	0.0430	(0.39)	-0.0966	(-0.43)	-0.5032	(-1.15)
Leverage Ratio	1.0785	(0.47)	0.3401	(0.86)	-0.9266	(-0.54)	1.3211	(0.66)
Debt to Equity Ratio	-0.1225	(-0.61)	0.0113	(0.09)	-0.0376	(-0.55)	0.7814	(1.29)
Efficiency Ratio	0.0000	(0.55)	-0.0000	(-0.38)	-0.0000	(-1.20)	-0.0000	(-0.90)
Lg Equity	-15.3951	(-0.54)	7.7623	(0.76)	-131.4238	(-0.94)	148.5862	(1.04)
Lg Assets	15.8161	(0.51)	-7.0750	(-1.19)	132.1919	(0.96)	-128.9536	(-0.98)
Rule of Law	99.3878	(0.83)	-14.3968	(-0.46)	64.0482	(0.49)	-507.2975	(-0.94)
Gov Eff	-49.2907	(-1.01)	9.2250	(0.10)	-150.8311	(-0.97)	-209.8062	(-1.59)
Voice Acct	0.0000	(omitted)	16.5912	(0.15)	93.4308	(1.37)	0.0000	(omitted)
Reg Qual	-15.4157	(-0.53)	0.0000	(omitted)	188.6643	(0.79)	326.4958	(0.90)
GDP	-0.0000	(-0.51)	-0.0000	(-0.06)	-0.0000	(-0.55)	0.0000	(0.91)
CPI	0.4635	(0.44)	0.0904	(0.05)	-0.4998	(-0.40)	-1.2604	(-0.93)
Islamic_bank	-24.8060	(-0.56)	8.1758	(0.50)	0.0000	(omitted)	90.0271	(2.40)
_cons	0.0000	(omitted)	0.0000	(omitted)	0.0000	(omitted)	0.0000	(omitted)
Obs / Groups / Instruments	112 / 12 / 24		106 / 12 / 24		98 / 12 / 24		106 / 12 / 24	
Wald χ^2	437.35		74.51		164.16		215.03	
Prob > χ^2	0.000		0.000		0.000		0.000	
AR(1)	-0.77		-2.59**		-1.32		-1.03	
AR(2)	-0.33		0.39		0.25		0.17	
Sargan test	6.53		5.19		3.51		36.48	
Hansen test	0.00		0.00		0.00		0.00	
Difference-in-Hansen test	$\chi^2(1) = 0.00$		$\chi^2(1) = 0.00$		$\chi^2(1) = 0.00$		$\chi^2(1) = 0.00$	

Table 12. Country Focuses Analysis - Malaysia

Notes: ** $p < 0.05$, *** $p < 0.01$. R^2 (W/B/O) represents Within (W), Between (B), and Overall (O) R-squared values.

Turning to Malaysia, the performance comparison between commercial banks and Islamic banks reveals distinctive patterns across various financial metrics. For NIM, Islamic banks exhibit negative coefficients, suggesting lower net interest margins compared to commercial banks, though these differences are not statistically significant. The analysis of ROA shows that Islamic banks tend to have lower returns on assets, as indicated by the negative coefficients, reflecting potentially different profit-generation mechanisms compared to commercial banks. Regarding NPL ratios, Islamic banks demonstrate lower coefficients, which may indicate more prudent loan management and lower levels of non-performing loans compared to commercial banks. However, these results are not statistically significant. Lastly, in terms of LTD ratios, Islamic banks display higher coefficients, suggesting a higher ratio of loans to deposits, which may reflect their

operational strategies and customer base characteristics. These findings highlight the distinct financial dynamics and performance characteristics of commercial and Islamic banks in Malaysia, offering important insights into their comparative operational efficiencies and financial health.

6. Summary and Conclusion

This study provides a comprehensive analysis of the financial performance of commercial banks, savings banks, and Islamic banks across five countries: Hong Kong, South Korea, Taiwan, Malaysia, and Vietnam. Employing both RE regression and the 2SGMM approach, key performance metrics were analyzed, specifically NIM, ROA, NPL, and LTD.

The findings indicate distinct performance differences among the different types of banks. Savings banks generally exhibit higher NIM and ROA coefficients compared to commercial banks, though these differences are not statistically significant. Savings banks also tend to have higher NPL ratios, suggesting greater challenges in loan performance management, particularly in South Korea. In contrast, commercial banks benefit from higher leverage in terms of ROA, which can be attributed to their diverse revenue streams and aggressive asset management strategies. Islamic banks display lower coefficients for both NIM and ROA, reflecting their unique operational frameworks influenced by Sharia-compliant financial principles, as observed in Malaysia. Additionally, the efficiency ratio plays a crucial role in determining LTD ratios across all bank types, emphasizing the importance of operational efficiency. The robustness check using 2SGMM validated and extended these results by addressing unobserved heterogeneity, endogeneity, and dynamics in the data.

Comparing these findings to the existing literature, the paper's results align with previous studies that highlight the conservative nature of savings banks and their focus on stability over profitability[33][34]. The higher NPL ratios observed in savings banks resonate with[11] and[36], who reported similar challenges during the global financial crisis. Islamic banks' lower NIM and ROA coefficients support the mixed findings in the literature regarding their profitability compared to conventional banks[89][90]. The distinct operational principles of Islamic banks, such as profit-sharing and ethical investments, likely contribute to these differences.

These findings highlight significant differences in financial performance metrics between commercial, savings, and Islamic banks, providing valuable insights into their distinct operational frameworks and strategic priorities. The results reveal that savings banks generally exhibit higher net interest margins and return on assets but face greater challenges with non-performing loans, likely due to their focus on retail banking and conservative lending practices, as seen in South Korea. In contrast, commercial banks benefit from higher leverage in terms of return on assets, suggesting that their diverse revenue streams and aggressive asset management strategies contribute to better asset returns. Islamic banks show lower net interest margins and return on assets, reflecting their adherence to Sharia-compliant financial principles which prohibit interest and emphasize profit-sharing and ethical investments, as evidenced by their performance in Malaysia.

For banks, these findings underscore the importance of tailoring risk management practices to their specific operational frameworks. Savings banks need to enhance their credit risk management to address the higher non-performing loans. Commercial banks can leverage their diverse revenue streams and asset management strategies to further optimize

returns. Islamic banks might focus on innovative Sharia-compliant financial products and efficient operational practices to improve their profitability metrics. Additionally, the emphasis on operational efficiency across all bank types highlights a key area for performance improvement, suggesting that banks should invest in technologies and practices that streamline operations and enhance efficiency.

The results of the hypotheses testing are summarized in Table 13. This table provides a clear overview of how commercial banks compare to savings and Islamic banks across key financial performance metrics. The findings illustrate which hypotheses were supported and highlight the areas where commercial banks excel or face challenges relative to their counterparts.

Table 13. Summary of Hypotheses Testing Results		
Hypothesis	**Commercial banks have a ...**	**Result**
H_1	Higher ROA compared to savings and Islamic banks across HK, KR, TW, MY, and VN.	Supported
H_2	Lower NPL ratio compared to savings and Islamic banks across HK, KR, TW, MY, and VN.	Not Supported
H_3	Higher NIM compared to savings and Islamic banks across HK, KR, TW, MY, and VN.	Not Fully Supported
H_4	Higher LTD ratio compared to savings and Islamic banks across HK, KR, TW, MY, and VN.	Supported

Notes: HK = Hong Kong, KR = South Korea, TW = Taiwan, MY = Malaysia, VN = Vietnam.

6.1. Practical Implications

The study's findings have significant practical implications for banks and their stakeholders. Savings banks must enhance credit risk management to address higher non-performing loans, while commercial banks can optimize returns by leveraging diverse revenue streams and aggressive asset management strategies. Islamic banks can improve profitability by developing innovative Sharia-compliant financial products that cater to their unique customer base. Moreover, banks should invest in technologies and processes that enhance operational efficiency, aligning their operational frameworks with strategic priorities. Regulatory bodies can develop tailored guidelines and policies that consider the unique performance dynamics of different bank types, ensuring a level playing field and promoting financial stability. By analyzing multiple countries, the study provides opportunities for cross-country learning and knowledge sharing, fostering innovation and driving performance improvements in the banking industry.

6.2. Theoretical Implications

The findings of this study offer significant theoretical implications under the RBV theory. The observed performance differences among commercial banks, savings banks, and Islamic banks highlight how the unique resources and capabilities of each bank type influence their financial metrics. Commercial banks' higher ROA, attributed to their advanced technological infrastructure and diverse revenue streams, supports the RBV theory that these resources

facilitate economies of scale and scope. In contrast, the higher NPL ratios in savings banks suggest that, despite strong customer relationships and localized knowledge, there is a need for better risk management practices. Islamic banks' lower NIM and ROA reflect their adherence to Sharia-compliant principles, underscoring the influence of these unique resources on their financial performance. These results demonstrate the importance of effectively deploying and managing unique resources to maintain a competitive advantage, directly impacting financial performance and operational success in the banking sector.

6.3. Limitations and Future Research Directions

While comprehensive in its scope, this study has certain limitations that warrant acknowledgement. First, the availability and accessibility of data from certain countries or bank types may have introduced potential biases or gaps in the analysis. Additionally, the study's focus on specific financial performance metrics may overlook other relevant factors influencing bank operations and success. Future research could expand the breadth of metrics examined and incorporate qualitative insights from banking professionals to enrich the understanding of performance drivers. Moreover, as the banking landscape continues to evolve with technological advancements and regulatory shifts, longitudinal studies tracking these changes would provide valuable insights into the dynamic nature of performance disparities over time.

References

1. ^Wil Martens, Phuong TM Pham. (2021). Reducing agency issues: Examining earnings management constraints in emerging markets. Academy of Accounting and Financial Studies Journal. 25:1–22.

2. a, bD. P. Sari, E. Endri. (2019). Role of banking sector in economic development. International Journal of Economics, Business, and Management Studies. 6(1):25–35.

3. ^E. Endri. (2018). Bank performance measurement using return on assets and return on equity. International Journal of Economics and Financial Issues. 8(5):235–241.

4. ^S. Khtar, M. Achour. (2019). Determinants of net interest margin in the banking industry: A systematic review. Journal of Financial Studies. 23(1):1–18.

5. ^Y. Wati, R. Hendrawan. (2020). Analysis of the effect of net interest margin on return on assets (ROA) in PT bank rakyat indonesia (persero) tbk. Journal of Business and Management. 20(2):1–12.

6. ^M. Sulistiawati, T. Haryanto. (2019). The impact of net interest margin on bank stock prices. Journal of Financial Markets. 17(2):105–115.

7. a, b, c, dR. Ahmad, H. M. Rashid. (2020). Impact of loan to deposit ratio on the performance of malaysian commercial banks. Journal of Banking and Finance. 45(2):123–137.

8. a, bA. Ismail, H. Taufiq. (2019). The effect of loan to deposit ratio on stock returns: Evidence from commercial banks in malaysia. Journal of Finance and Banking. 22(2):1–10.

9. a, bT. Nguyen, T. Tran. (2020). Determinants of non-performing loans in vietnamese commercial banks. Journal of Financial Studies. 24(1):1–18.

10. [a, b] T. Le, T. Nguyen. (2019). The impact of non-performing loans on financial performance of commercial banks in vietnam. Journal of Business and Management. 19(2):1–12.

11. [a, b] JM Groeneveld. (2015). Governance of european cooperative banks. TIAS, Working Paper 2015.

12. [^] Gabriel Jiménez, Jesús Saurina. (2004). Collateral, type of lender and relationship banking as determinants of credit risk. Journal of banking & Finance. 28(9):2191–2212.

13. [^] Wil Martens, Prem WS Yapa, Maryam Safari. (2020). The impact of financial statement comparability on earnings management: Evidence from frontier markets. International Journal of Financial Studies. 8(4):73.

14. [^] E. F. Brigham, J. F. Houston. (2017). Financial management: Theory and practice. Cengage Learning.

15. [^] Panayiotis P. Athanasoglou, Sophocles N. Brissimis, Matthaios D. Delis. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Journal of International Financial Markets, Institutions and Money. 18(2):121–136.

16. [^] Muhammad Yusuf, Surachman Surjaatmadja. (2018). Analysis of financial performance on profitability with non performance financing as variable moderation (study at sharia commercial bank in indonesia period 2012–2016). International Journal of Economics and Financial Issues. 8(4):126–132.

17. [^] Jamil Salem Al Zaidanin, Omar Jamil Al Zaidanin. (2021). The impact of credit risk management on the financial performance of united arab emirates commercial banks. International Journal of Research in Business and Social Science (2147-4478). 10(3):303–319.

18. [^] Ridwan Ridwan, Sugianto Sugianto, Eka Setyawati. (2021). The effect of TPF, NPF and fee based income on the profitability of islamic banks with financing as an intervening variable. Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences. 4(2):1758–1771.

19. [^] H. T. Phan, T. N. Hoang, L. V. Dinh, D. N. Hoang. (2020). The determinants of listed commercial banks' profitability in vietnam. Journal of Asian Finance, Economics and Business. 7(11):219–227. doi:10.13106/JAFEB.2020.VOL7.NO11.219

20. [^] A. Munandar. (2020). Pengaruh kualitas aktiva produktif dan net performing financing (npf) terhadap net operating margin (nom) bank umum syariah dan unit usaha syariah periode juni 2014 – maret 2020. Journal of Economics.

21. [^] Z. A. Kamarizah. (2022). Peran net interest margin dalam memediasi hubungan faktor-faktor yang mempengaruhi return on asset. Jurnal Profitabilitas dan Risiko Perbankan. 3(1):509–522.

22. [^] M. Pritadyana, N. Amah, M. Novitasari. (2019). Pengaruh fdr dan nim terhadap roe dengan npf sebagai variabel moderasi.

23. [^] L. Ayuni, L. N. Rani. (2020). Analisis faktor penentu dan indikator ekonomi pada net interest margin bank syariah. Jurnal Ekonomi dan Manajemen. 7(11):2074–2088.

24. [a, b] H. H. Lee, Y. S. Chen. (2015). Net interest margin, risk, and banking system: Evidence from taiwan. Review of Pacific Basin Financial Markets and Policies. 18(3):1–23.

25. [^] Cyn-Young Park, Kwanho Shin. (2021). COVID-19, nonperforming loans, and cross-border bank lending. Journal of Banking & Finance. 133:106233.

26. [^] Hasni Abdullah, Ismail Ahmad, Imbarine Bujang. (2015). Loan loss provisions and macroeconomic factors: The case of malaysian commercialbanks. International business management. 9(4):377–383.

27. ^Solarin Sakiru Adebolaa, Jauhari Dahalan, et al. (2011). An ARDL approach to the determinants of nonperforming loans in islamic banking system in malaysia. Arabian Journal of Business and Management Review (Kuwait Chapter). 1(2):20–30.

28. ^N. A. Ismail, M. F. Kamarulzaman. (2021). Banking and economic growth: Comparison between islamic and conventional banking in malaysia. South Asian Journal of Social Studies and Economics. 12(1):29–44.

29. ^P. H. Nguyen. (2021). Impact of macroeconomic factors and interaction with institutional performance on vietnamese bank share prices. Banks and Bank Systems. 16(1).

30. ^Frederik Mergaerts, Rudi Vander Vennet. (2016). Business models and bank performance: A longitudinal analysis. Journal of Banking and Finance. 66:205–218.

31. ^Matthias Köhler. (2015). Which banks are more risky? The impact of business models on bank risk. Journal of Financial Stability. 16:285–297.

32. ^Hans Groeneveld. (2019). Savings banks in europe: A review of the literature. Journal of Financial Stability. 43:105–116.

33. a, b, c, dOlivier Butzbach, Kurt Von Mettenheim. (2014). The political economy of savings banks. Journal of Economic Policy and Reform. 17:147–162.

34. a, b, c, dRym Ayadi, David T. Llewellyn, Reinhard H. Schmidt. (2010). Consumer protection in european banking regulation. Journal of Financial Regulation and Compliance. 18:254–271.

35. ^Hans Groeneveld. (2015). Savings banks and the global financial crisis. Journal of Financial Stability. 19:241–253.

36. a, b, c, dJohn A. Goddard, John O. S. Wilson. (2004). The evolution of financial regulation and supervision in the EU. Journal of Financial Regulation and Compliance. 12:171–186.

37. a, bGiovanni Ferri, Marcello Messori. (2015). The impact of the global financial crisis on the italian banking system. Journal of Financial Management and Analysis. 28:1–13.

38. ^Daniel Foos, Lars Norden, Martin Weber. (2010). The impact of credit crunch on bank performance. Journal of Financial Stability. 6:159–171.

39. a, bLaetitia Lepetit, Eric Nys, Philippe Rous, Amine Tarazi. (2008). The expansion of services in commercial banks and bank performance. Journal of Financial Services Research. 33:125–144.

40. ^Kevin J. Stiroh. (2004). Diversification in banking: Is noninterest income the answer? Journal of Money, Credit and Banking. 36:853–882.

41. a, b, cZamir Iqbal, Abbas Mirakhor. (2011). An introduction to islamic finance: Theory and practice. John Wiley & Sons.

42. a, bMuhammad Ayub. (2007). Understanding islamic finance. John Wiley & Sons.

43. ^Mahmoud A. El-Gamal. (2006). Islamic finance: Law, economics, and practice. Cambridge University Press.

44. ^Brian Kettell. (2011). Introduction to islamic banking and finance. John Wiley & Sons.

45. ^Abdel-Hameed M. Bashir. (2001). Assessing the performance of islamic banks: Some evidence from the middle east. Topics in Middle Eastern and North African Economies. 3:1–20.

46. ^Martin Čihák, Heiko Hesse. (2010). Islamic banks and financial stability: An empirical analysis. Journal of Financial Services Research. 38(2):95–113.

47. ^Pejman Abedifar, Philip Molyneux, Amine Tarazi. (2013). Risks in islamic banking: A comparative analysis. Journal of

Banking & Finance. 37(2):226–246.

48. ^Jill Johnes, Marwan Izzeldin, Vassilios Pappas. (2014). A comparative analysis of the financial performance of conventional and islamic banks: The case of malaysia. Journal of Banking & Finance. 38:1–13.

49. a, bThorsten Beck, Asli Demirgüç-Kunt, Ouarda Merrouche. (2013). Islamic vs. Conventional banking: Business model, efficiency and stability. Journal of Banking & Finance. 37(2):433–447.

50. a, bSabur Mollah, Mahbub Zaman. (2015). Shari'ah supervision, corporate governance and performance: Conventional vs. Islamic banks. Journal of Banking & Finance. 58:418–435.

51. ^Dennis Olson, Tayseer A. Zoubi. (2008). Using accounting ratios to distinguish between islamic and conventional banks in the GCC region. The International Journal of Accounting. 43(1):45–65.

52. ^Achmad Faozan. (2022). Comparison of islamic commercial banks (BUS) and islamic business units (UUS) in conventional banks in indonesia: Risk analysis. International Journal of Islamic Business and Economics. 6(1):34–50.

53. ^Abdul Bahari, Asep Khairudin. (2022). Risk management practices in islamic business units of conventional banks in indonesia. Journal of Islamic Finance. 5(3):87–101.

54. ^Sri Wulandari, Agus Subagio. (2022). Comparative study on liquidity risk, operational risk, and credit risk in indonesian islamic banking sector. Journal of Islamic Banking and Finance. 10(2):121–135.

55. a, bEvan Gibson. (2022). A regulatory design for financial stability in hong kong. Cambridge University Press.

56. ^G. N. Starikova. (2022). Bank regulation and supervision.

57. ^Raja Faridatul Shima Raja Hassan, Rusni Hassan, Ashurov Sharofiddin. (2023). Risk management practices for islamic financial institutions during an unprecedented crisis: Bank negara malaysia's approach to operational resilience. Onomázein. (62 (2023): December):1153–1164.

58. ^Franklin Allen, Xian Gu, Julapa Jagtiani. (2021). A survey of fintech research and policy discussion. Review of Corporate Finance. 1:259–339.

59. ^John Elvin Louis, Beumhoo Jang. (2022). A comparative legal study on neobank between south korea and indonesia. Journal of Law and Policy Transformation. 7(1):109–123.

60. ^Wil Martens. (2024). Beyond the barriers: Institutional strength as a shield in curbing earnings manipulation. Qeios. doi:10.32388/33ZFSO

61. ^Angela Attrey, Molly Lesher, Christopher Lomax. (2020). The role of sandboxes in promoting flexibility and innovation in the digital age.

62. ^Nafis Alam, Lokesh Gupta, Abdolhossein Zameni, Nafis Alam, Lokesh Gupta, et al. (2019). FinTech regulation. Fintech and Islamic Finance: Digitalization, Development and Disruption. :137–158.

63. ^W. Martens. (2024). Navigating complexity: Uncovering the intricate dynamics between intellectual capital, efficiency, and performance in taiwan's banking sector.

64. ^Yi-Hua Lin, Cheng-Hsun Lee, Shun-Yi Fang. Environmental, social and governance (ESG) initiatives and developments in taiwan. In: Financial and technological innovation for sustainability.: Routledge 2023. pp. 165–187.

65. ^Atikullah Abdullah. (2017). A comparison between malaysia and indonesia in islamic banking industry. Research Journal of Business and Management. 4(3):276–286.

66. ^Eric HY Koh. (2018). Special topic: Practitioner insight on risk management practices 1. The Malaysian Banking

Industry. :125–153.

67. ^*Jessie Poon, Yew Wah Chow, Michael Ewers, Razli Ramli. (2020). The role of skills in islamic financial innovation: Evidence from bahrain and malaysia. Journal of Open Innovation: Technology, Market, and Complexity. 6(3):47.*

68. ^*Rosylin Mohd Yusof, M. Shabri Abd. Majid. (2008). Towards an islamic international financial hub: The role of islamic capital market in malaysia. International Journal of Islamic and Middle Eastern Finance and Management. 1(4):313–329.*

69. ^*Wil Martens, Ngoc Minh Chua Bui. (2022). Loan loss provisioning and efficiency: A study of frontier market banks. VNU Journal of Economics and Business. 2(4).*

70. ^*Jay K. Rosengard, Huỳnh Thế Du. (2009). Funding economic development: A comparative study of financial sector reform in vietnam and china. Harvard John F Kennedy School of Government.*

71. ^*Jens Kovsted, John Rand, Finn Tarp, Dinh Tai Nguyen, Van Huong Nguyen, et al. (2003). Financial sector reforms in vietnam: Selected issues and problems.*

72. ^*Trung Viet Nguyen, Joseph McCahery. (2020). Virtual bank by FinTech firms–global trending, challenges, solutions and experience of regulating virtual banks in vietnam. Working Paper. Tilburg University, the Netherlands 2020.*

73. ^*Kim Anh Dao. (2024). Enhancing the responsibilities of data controllers in vietnam: Insights from the european general data protection regulation. VNU Journal of Science: Legal Studies. 40(1).*

74. ^*M. Rouse. (2023). Vietnam's personal data protection decree (no. 13/2023/ND-CP). 2023.*

75. ^*B. Wernerfelt. (1984). A resource-based view of the firm. Strategic Management Journal. 5(2):171–180.*

76. ^*J. B. Barney. (1991). Firm resources and sustained competitive advantage. Journal of Management. 17(1):99–120.*

77. ^*O. T. K. Vu, A. Duarte Alonso, W. Martens, L. Do, L. N. Tran, et al. (2023). Coffee and gastronomy: A potential "marriage"? The case of vietnam. International Journal of Contemporary Hospitality Management. 35(6):1943–1965.*

78. ^*A. Duarte Alonso, W. Martens, J. L. T. Ong. (2022). Food tourism development in wine regions: Perspectives from the supply side. Current Issues in Tourism. 25(12):1968–1986.*

79. ^*A. Dietrich, G. Wanzenried. (2011). Determinants of bank profitability before and during the crisis: Evidence from switzerland. Journal of International Financial Markets, Institutions and Money. 21(3):307–327.*

80. ^*N. A. B. Rahmani. (2022). Analisis pengaruh non performing loan, loan to deposit ratio, biaya operasional terhadap pendapatan operasional terhadap kinerja keuangan pada bank umum syariah. Dinamika Akuntansi Keuangan dan Perbankan. 11(1):1–12.*

81. ^*R. Guerrero, M. J. Segovia-Vargas. (2004). Productivity among the savings banks in the european union: An exploratory study before the single banking market. Applied Financial Economics. 14(13):913–922.*

82. ^*Wil Martens, Prem Yapa, Maryam Safari. (2021). Earnings management in frontier market: Do institutional settings matter? Economies. 9(1):17.*

83. a, b*Andrew Gelman, Jennifer Hill. (2006). Data analysis using regression and multilevel/hierarchical models. Cambridge university press.*

84. ^*Tom S. Clark, Drew A. Linzer. (2015). Should i use fixed or random effects? Political science research and methods. 3(2):399–408.*

85. ^*David K. Park, Andrew Gelman, Joseph Bafumi. (2006). State-level opinions from national surveys: Poststratification*

using multilevel logistic regression. Public opinion in state politics. :209–28.

86. ^R. Blundell, S. Bond. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics. 87(1):115–143.

87. ^Manuel Arellano, Stephen Bond. (1991). Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. The Review of Economic Studies. 58(2):277–297.

88. ^F. Windmeijer. (2005). A finite sample correction for the variance of linear two-step GMM estimators. Journal of Econometrics. 126(1):25–51.

89. ^T. Beck, A. Demirgüç-Kunt, O. Merrouche. (2013). Islamic vs. Conventional banking: Business model, efficiency and stability. Journal of Banking & Finance. 37(2):433–447.

90. ^S. Mollah, M. Zaman. (2015). Shari'ah supervision, corporate governance and performance: Conventional vs. Islamic banks. Journal of Banking & Finance. 58:418–435.