



**MODERATING EFFECTS OF ECONOMIC UNCERTAINTY ON COUNTRY
GOVERNANCE, GLOBALISATION, AND BANK EFFICIENCY IN ISLAMIC
AND CONVENTIONAL BANKS**

By

LUO HENG

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the
Degree of Doctor of Philosophy**

December 2024

SPE 2024 55

All material contained within the thesis, including without limitation text, logos, icons, photographs, and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non-commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright © Universiti Putra Malaysia



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree of Doctor of Philosophy

**MODERATING EFFECTS OF ECONOMIC UNCERTAINTY ON COUNTRY
GOVERNANCE, GLOBALISATION, AND BANK EFFICIENCY IN ISLAMIC
AND CONVENTIONAL BANKS**

By

LUO HENG

December 2024

Chairman : Associate Professor Fakarudin bin Kamarudin, PhD
School : Business and Economics

Banks are essential to the economy as they facilitate the financial needs of individuals and businesses, create wealth through lending and deposit-taking, and foster economic growth. The complexity of financial markets has made bank efficiency a crucial factor in assessing the efficiency of banking operations. As a result, enhancing bank efficiency has become a prominent area of academic research. Country governance (CG) also acts as a crucial framework, which constitutes banks' operational and regulatory environments that impact their overall performance and strategic choices. In addition, globalisation also makes financial markets more interconnected, leading to opportunities and challenges that have an immediate effect on the effectiveness and operations of banks. Economic policy uncertainty (EPU) also causes government policy to fluctuate, which impacts banks' risk management plans and decision-making procedures, ultimately undermining their performance and stability. This study analyses the impact of CG and

globalisation on the efficiency of conventional banks (CBs) and Islamic banks (IBs) as well as the moderating effect of EPU on the above nexus in three main Islamic hubs for the period of 2005-2021. The study includes data from 110 IBs and 353 CBs across 15 countries in the three regions. The empirical analysis consists of two stages. The first stage utilised data envelopment analysis to gauge the efficiency levels of both CBs and IBs. Following that, panel regression analysis through pooled ordinary least square, fixed effect model, and random effect model was conducted. The instrumental variables two-stage least squares method was also employed as a robustness check to address the issue of endogeneity. The study's findings indicate that CG and globalisation were important determinants of bank efficiency. This study also revealed that EPU had a significant moderating effect on the impact of CG and globalisation on banks' efficiency. The study adds to the corpus of empirical and practical knowledge already in existence. Firstly, this research contributes to expanding the existing literature on the factors influencing bank efficiency in the three main Islamic hubs. Secondly, the study emphasises the moderating role of EPU in the nexus between CG, globalisation, and bank efficiency. By examining the moderating effects, this research further enhances the understanding of the complex interactions between these variables. Finally, the findings suggest that policymakers and bank managers should pay closer attention to governance systems, the evolving global economic environment, and EPU, as these factors can significantly influence bank efficiency and overall operational performance.

Keywords: Bank Efficiency; Country Governance; Economic Policy Uncertainty; Globalisation

SDG: GOAL 8: Decent Work and Economic Growth; GOAL 16: Peace, Justice, and Strong Institutions



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KESAN PENYEDERHANAAN KETIDAKPASTIAN DASAR EKONOMI
TERHADAP TADBIR URUS NEGARA, GLOBALISASI DAN KECEKAPAN
BANK**

Oleh

LUO HENG

Disember 2024

Pengerusi : Profesor Madya Fakarudin bin Kamarudin, PhD
Sekolah : Perniagaan dan Ekonomi

Bank memainkan peranan penting dalam ekonomi dengan memenuhi keperluan kewangan individu dan perniagaan, selain menjana kekayaan melalui aktiviti pemberian pinjaman dan pengambilan deposit serta merangsang pertumbuhan ekonomi. Kepelbagaian dan kerumitan pasaran kewangan menjadikan kecekapan bank sebagai faktor utama dalam menilai keberkesanan operasi perbankan. Oleh itu, usaha untuk meningkatkan kecekapan bank kini menjadi tumpuan utama dalam penyelidikan akademik. Tadbir urus negara (CG) juga berfungsi sebagai kerangka utama yang membentuk persekitaran operasi dan kawal selia bank yang memberi kesan kepada prestasi keseluruhan dan pilihan strategik mereka. Selain itu, globalisasi semakin menghubungkan pasaran kewangan dunia, membuka peluang serta cabaran yang memberi kesan langsung terhadap keberkesanan dan operasi bank. Ketidaktastian dasar ekonomi (EPU) turut memainkan peranan dengan menyebabkan perubahan dasar kerajaan yang boleh

mempengaruhi pengurusan risiko serta keputusan bank, seterusnya menjejaskan prestasi dan kestabilan mereka. Kajian ini meneliti kesan CG dan globalisasi terhadap kecekapan bank konvensional (*CB*) dan bank Islam (*IB*), serta peranan *EPU* sebagai faktor penyederhanaan dalam hubungan tersebut di tiga hab utama perbankan Islam bagi tempoh 2005 hingga 2021. Data kajian merangkumi 110 buah *IB* dan 353 *CB* dari 15 buah negara dalam tiga wilayah yang dipilih. Analisis empirikal dijalankan dalam dua peringkat. Peringkat pertama menggunakan analisis penyampulan data bagi mengukur tahap kecekapan *CB* dan *IB*. Peringkat kedua melibatkan analisis regresi panel menggunakan kaedah pengumpulan kuasadua terkecil, model kesan tetap, dan model kesan rawak. Bagi menangani isu endogeniti, kaedah pemboleh ubah *instrumental* melalui dua peringkat kuasadua terkecil turut digunakan sebagai ujian keteguhan. Hasil kajian menunjukkan bahawa CG dan globalisasi merupakan faktor utama yang menentukan kecekapan bank. Selain itu, kajian ini juga mendapati bahawa *EPU* mempunyai kesan penyederhanaan yang ketara terhadap hubungan antara CG, globalisasi, dan kecekapan bank. Kajian ini memberi sumbangan penting kepada literatur sedia ada dalam tiga aspek utama. Pertama, ia memperluas pemahaman terhadap faktor yang mempengaruhi kecekapan bank dalam tiga hab utama perbankan Islam. Kedua, ia menekankan peranan *EPU* sebagai faktor penyederhanaan dalam hubungan antara CG, globalisasi, dan kecekapan bank. Dengan menganalisis kesan penyederhanaan ini, kajian ini memperkukuh pemahaman terhadap interaksi kompleks antara pemboleh ubah tersebut. Akhir sekali, dapatan kajian mencadangkan bahawa penggubal dasar dan pengurus bank perlu memberi perhatian lebih serius

terhadap sistem tadbir urus, perubahan dalam persekitaran ekonomi global, serta ketidakpastian dasar ekonomi, kerana semua faktor ini mampu memberi kesan besar terhadap kecekapan dan prestasi keseluruhan bank.

Kata Kunci: Kecekapan Bank; Tadbir Urus Negara; Ketidakpastian Dasar Ekonomi; Globalisasi

SDG: MATLAMAT 8: Pekerjaan yang Layak dan Pertumbuhan Ekonomi; MATLAMAT 16: Keamanan, Keadilan dan Institusi yang Kukuh



ACKNOWLEDGEMENTS

First and foremost, I extend my heartfelt gratitude to my parents, wife and children for their unwavering encouragement and boundless support.

I would also like to express my deepest appreciation to my supervisors, especially Assoc. Prof. Fakarudin Kamarudin and Dr. Normaziah Mohd Nor, for their invaluable guidance, assistance, and steadfast support throughout my graduate studies and personal life. Your mentorship has been instrumental in my journey. May God bless you always.

Finally, I wish to convey special thanks to my friends, lecturers, and everyone who has helped me, directly or indirectly, in completing my studies. Your contributions and encouragement have been greatly appreciated.

This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

Fakarudin bin Kamarudin, PhD

Associate Professor
School of Business and Economics
Universiti Putra Malaysia
(Chairman)

Normaziah binti Mohd Nor, PhD

Senior Lecturer
School of Business and Economics
Universiti Putra Malaysia
(Member)

ZALILAH MOHD SHARIFF, PhD

Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 8 May 2025

TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iv
ACKNOWLEDGEMENTS	vii
APPROVAL	viii
DECLARATION	x
LIST OF TABLES	xv
LIST OF FIGURES	xvii
LIST OF APPENDICES	xviii
LIST OF ABBREVIATIONS	xix
 CHAPTER	
 1 INTRODUCTION	 1
1.1 Introduction	1
1.2 Background of the Study	1
1.2.1 Islamic Banks' (IBs) and Conventional Banks' (CBs) Efficiency	1
1.2.2 Country Governance	7
1.2.3 Globalisation	9
1.2.4 Economic Policy Uncertainty (EPU)	11
1.3 Problem Statement	14
1.4 Research Questions	19
1.5 Objectives of the Study	19
1.6 Significance of the Study	19
1.7 Scope of the Study	22
1.8 Organisation of the Thesis and Research Framework	24
1.9 Chapter Summary	25
 2 THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE	 26
2.1 Introduction	26
2.2 Theoretical Framework	26
2.2.1 Theory of Cobb Douglas Production	27
2.2.2 Theory of Regulation	28
2.2.3 Other Competing Theory	31
2.2.4 Theory of Trade	32
2.2.5 Financial Development Theory	33
2.2.6 Social Friction Theory	34
2.2.7 Theory of Information Security	35
2.2.8 Theory of Uncertainty	36
2.3 Evolution of Bank Efficiency Studies	38
2.3.1 Financial Ratios Approach	38
2.3.2 Efficiency Frontier Approach	40
2.4 Literature Review	42

2.4.1	Efficiency of IBs and CBs	42
2.4.2	Control Variables	42
2.4.3	The Country Governance-Bank Efficiency Nexus	49
2.4.4	The Impact of Globalisation on Banks	62
2.4.5	Economic Policy Uncertainty on Bank Efficiency	76
2.5	Summary on Gaps of Literature	88
3	DATA AND RESEARCH METHODOLOGY	93
3.1	Introduction	93
3.2	Source of Data and Data Selection	93
3.3	Method of Measurement	94
3.3.1	First Stage Analysis	95
3.3.2	Second Stage Analysis	98
3.4	Hypothesis Development	111
3.4.1	Country Governance	111
3.4.2	Globalisation	113
3.4.3	Economic Policy Uncertainty	119
3.5	Chapter Summary	121
4	RESULTS AND DISCUSSIONS	123
4.1	Introduction	123
4.2	Results of DEA	123
4.2.1	Efficiency of IBs vs. CBs for Individual Year	124
4.2.2	Efficiency of IBs vs. CBs for Years 2005 to 2021	126
4.2.3	Summary on Level of Efficiency	127
4.3	Preliminary Testing before Panel Regression Analysis	128
4.3.1	Descriptive Statistics of Research Variables	128
4.3.2	Correlation Matrix	129
4.4	Results and Tests of Panel Regression Analysis	131
4.4.1	The Impact of Control Variables on IBs and CBs	131
4.4.2	Does CG Matter for Banks' Efficiency?	139
4.4.3	Does Globalisation Matter for Banks' Efficiency?	142
4.4.4	Controlling for Potential Endogeneity	151
4.4.5	Does EPU Moderate the Impact of CG on Banks' Efficiency?	157
4.4.6	Does EPU Moderate the Impact of Globalisation on Banks' Efficiency?	160
4.5	Chapter Summary	167
5	CONCLUSION AND RECOMMENDATION	171
5.1	Introduction	171
5.2	Conclusion	171
5.2.1	Research Objective 1: CG and Bank Efficiency	171
5.2.2	Research Objective 2: Globalisation and Bank Efficiency	172

5.2.3	Research Objective 3: Moderating Effect of EPU between CG and Bank Efficiency	173
5.2.4	Research Objective 4: Moderating Effect of EPU between Globalisation and Bank Efficiency	173
5.3	Contribution of the Research	174
5.3.1	Contributions to Knowledge	174
5.3.2	Contributions to Practice	175
5.3.3	Contributions to Policy	177
5.4	Limitations and Recommendations for Future Research	179
REFERENCES		181
APPENDICES		208
BIODATA OF STUDENT		245
LIST OF PUBLICATIONS		246

LIST OF TABLES

Table	Page
1.1 List of the Top 10 Largest IBs in the Sample Countries in Year 2022	5
1.2 List of the Top 10 Largest CBs in the Sample Countries in Year 2022	6
1.3 EPU of the Sample Region for Years 2005 to 2021	13
2.1 Literature Matrix for COC-Bank Efficiency Nexus	57
2.2 Literature Matrix for VA-Bank Efficiency Nexus	62
2.3 Literature Matrix for Trade Globalisation-Banks' Efficiency Nexus	65
2.4 Literature Matrix for Financial Globalisation-Banks' Efficiency Nexus	69
2.5 Literature Matrix for Interpersonal Globalisation-Banks' Efficiency Nexus	70
2.6 Literature Matrix for Informational Globalisation-Banks' Efficiency Nexus	73
2.7 Literature Matrix for Cultural Globalisation-Banks' Efficiency Nexus	75
2.8 Literature Matrix for EPU-Banks' Efficiency Nexus	86
3.1 DEA Inputs and Outputs	98
3.2 Description of the Variables Used in the Regression Models	121
3.3 Summary of Chapter Three	122
4.1 Panel Analysis on CBs and IBs' Efficiency	124
4.2 Summary Mean of IBs and CBs' Efficiency for Years 2005 to 2021	127
4.3 Summary Statistics	128
4.4 Correlation Matric	130
4.5 Regression Results of CG on CBs: All Regions	137
4.6 Regression Results of CG on IBs: All Regions	138

4.7	Regression Results of Globalisation on CBs: All Regions	149
4.8	Regression Results of Globalisation on IBs: All Regions	150
4.9	IV Estimations CB for Country Governance	152
4.10	IV Estimations IB for Country Governance	153
4.11	IV Estimations CB for Globalisation	155
4.12	IV Estimations IB for Globalisation	156
4.13	Regression Results of Moderating Effect of EPU on the Impact of CG on CBs: All Regions	159
4.14	Regression Results of Moderating Effect of EPU on the Impact of CG on IBs: All Regions	160
4.15	Regression Results of Moderating Effect of EPU on the Impact of Globalisation on CBs: All Regions	165
4.16	Regression Results of Moderating Effect of EPU on the Impact of Globalisation on IBs: All Regions	166
4.17	Summary of Chapter 4.5	169

LIST OF FIGURES

Figure	Page
1.1 Country Governance of the Sample Region for Years 2005 to 2021	9
1.2 Globalisation of the Sample Region for Years 2005 to 2021	10
1.3 World Uncertainty Index (WUI): Global Index. GDP Weighted Average. 1990Q1 to 2024Q1	12
1.4 EPU of the Sample Region for Years 2005 to 2021	13
1.5 Research Framework	25
3.1 Decision Flowchart for Model Selection	100

LIST OF APPENDICES

Appendix	Page
A KOF Globalisation Index: Variables Description	208
B Heterogeneity Analysis: Results for Sub-Regions	211
C Data for CG and Globalisation	238



LIST OF ABBREVIATIONS

BCC	Banker, Charnes, and Cooper
BP	Breusch Pagan
CBs	Conventional Banks
CCR	Charnes, Cooper, and Rhodes Model
CG	Country Governance
COC	Control of Corruption
CPI	Consumer Price Index
CRS	Constant Returns to Scale
CuGI	Cultural Globalisation
DEA	Data Envelopment Analysis
DMUs	Decision Making Units
DRS	Decreasing Returns To Scale
EIU	Economist Intelligence Unit
EPU	Economic Policy Uncertainty
FEM	Fixed Effect Model
FDI	Foreign Direct Investment
FiGI	Financial Globalisation
GCC	Gulf Cooperation Council
GE	Government Effectiveness
GFC	Global Financial Crisis
GDP	Gross Domestic Product
GDPG	Gross Domestic Product Growth
IBs	Islamic Banks
IFSI	Islamic Financial Services Industry

InGI	Informational Globalisation
IpGI	Interpersonal Globalisation
IRS	Increasing Returns to Scale
IV-2SLS	Instrumental Variables Two-Stage Least Squares
LM	Lagrangian Multiplier
MENA	Middle East and North Africa
ME	Middle East
MFIs	Microfinance Institutions
NPV	Net Present Value
OLS	Ordinary Least Square
PTE	Pure Technical Efficiency
PV	Political Stability and Absence of Violence
R&D	Research and Development
RL	Rule of Law
REM	Random Effect Model
ROA	Return on Assets
ROAA	Return on Average Assets
ROE	Return on Equity
RQ	Regulatory Quality
SA	South Asia
SEA	Southeast Asia
SE	Scale Efficiency
SFA	Stochastic Frontier Analysis
TE	Technical Efficiency
TrGI	Trade Globalisation
VA	Voice and Accountability

VRS	Variable Returns to Scale
WDI	World Development Indicators
WUI	World Uncertainty Index





CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter explains the background of the study, problem statement, research questions, research objectives, significance of the study, scope of the study, and organisation of the thesis. It gives a broad overview of conventional banks (CBs) and Islamic banks (IBs) throughout key emerging hubs of Islamic banking and finance, including the Middle East (ME), Southeast Asia (SEA) and South Asia (SA), with information on how efficient they are as significant centres for Islamic finance and banking. This chapter also discusses the effects of country governance (CG) and globalisation on the efficiency of CBs and IBs. The moderating effect of economic policy uncertainty (EPU) on the impact of CG and globalisation on the efficiency of CBs and IBs is also mentioned in this chapter. The problem statement, research questions, research objectives, significance of the study, and scope of the study are then developed around the aforementioned theme.

1.2 Background of the Study

1.2.1 Islamic Banks' (IBs) and Conventional Banks' (CBs) Efficiency

The financial system channels funds from surplus units (lenders) to deficit units (borrowers) that then enhances economic efficiency (Herring & Santomero, 1995). Borrowers borrow from lenders in financial markets directly by selling financial instruments or indirectly via financial intermediaries (such

as banks). Nowadays, indirect finance accounts for the majority of the financial system, and banks in particular play a significant role in indirect finance. Based on business orientation, banks can be divided into IBs and CBs. These banks often seek opportunities that can maximise the benefits of their shareholders to adequately allocate resources (Lazonick & O'sullivan, 2000). To note, there is no difference between these banks with regards to the role of reducing adverse selection and moral hazards brought by information asymmetry as well as transaction costs. However, there are various ways in which Islamic banking is different to conventional banking.

IBs conduct their operations without relying on interest, whereas CBs engage in borrowing and lending activities based on pre-determined interest (M. Hussain et al., 2016). IBs use a variety of arrangements on the asset side, including sales at a profit margin (Murabahah), lease (Ijarah), profit-sharing (Musharakah and Muḍarabah), and fee-based services (e.g., Wakalah) (Berger et al., 2019; M. Hussain et al., 2016). These Shariah-compliant financial principles enable IBs to align with ethical considerations, creating a distinct operational framework. In Islamic banking, every banking operation that relies on leasing or sales needs to have a foundational asset. This is different to conventional banking, where the asset's value is determined only by its ability to secure collateral.

The first and most important factor that distinguishes IBs from CBs is that interest (Riba) is forbidden in all Islamic banking operations (Khaleel et al., 2022). Another factor that distinguishes IBs from CBs is profit and loss sharing

(Naouar et al., 2024). In Islamic banking, the mechanism of profit and loss sharing complies with Islam's teaching, where profits can only be gained from a transaction where the borrower and lender own a proper proportion of risk in buying a share. Conversely, CBs gain 'risk-free' profits from the odds of a deposit and loan. Specifically, CBs can gain 100 dollars from lenders at an annual rate of 1% and lend 100 to the borrower at an annual rate of 4%, thus gaining a 3% profit without investing more. Hence, the mechanism of CBs is inconsistent with profit and loss sharing. In addition, IBs must obey the Islamic rules known as the Shariah. The behaviour of borrowing, for example, must be asset-based in IBs, where every transaction should not be based on intangible objects.

In addition to the typical risks associated with banking activities, such as credit, market, liquidity, operational, and legal concerns, the operations of IBs also include a distinct set of dangers. These dangers consist of risks associated with (1) equity investments that result from profit-sharing programmes exclusive to IBs and (2) the business model itself. For example, IBs find it more difficult to manage liquidity risk in situations where there are few or no Shariah-compliant financial markets and a lender of last resort.

In terms of assets and influence, IBs have developed from being merely a financial experiment to an indispensable part of the global economy. IBs have demonstrated advantages compared to CBs in some areas, particularly during the global financial crisis (GFC) and COVID-19 periods. In 2021, the global economy bounced back strongly with a real gross domestic product (GDP)

growth (GDPG) of 5.9% compared to a contraction of –3.1% recorded in 2020. The improvement in global financial conditions was driven mainly by a resumption of economic activities due to an intensive COVID-19 vaccine roll-out in both advanced and emerging economies. Despite the revival of the COVID-19 pandemic in 2021, the global Islamic Financial Services Industry (IFSI) showed resiliency owing to the different COVID-19 policy support measures that supported economies and maintained its growth pace. The global IFSI worth USD 3.06 trillion in December 2021 represents an increase of 11.3% in assets compared to year over year in US dollars (2020: USD 2.75 trillion) (Islamic Financial Service Board, 2022). The global IFSI sector is anticipated to be valued at USD 3.25 trillion in 2022, reflecting a more moderate year-on-year growth rate of 6.2% in USD-denominated assets compared to the previous year's USD 3.06 trillion in 2021 (Islamic Financial Service Board, 2023). The worldwide IFSI demonstrated strength and resiliency in 2022 despite difficult global financial circumstances. However, challenges to the world economy's recovery remain formidable. These challenges include overall growing inflation, skyrocketing oil and commodity prices, supply chain disruptions, and geopolitical unpredictability. The Islamic trend is similar to that of prior years, where increases in the total value of the global financial system were led by the banking and Islamic capital markets. The term 'Islamic hubs' refers to regions that serve as centres for Islamic banking and finance activities, as highlighted in previous studies (Bassens et al., 2011; Ewers et al., 2018; Noor et al., 2014). As mentioned by Khan and Bhatti (2008), the three main centres of Islamic banking and finance are ME, SEA, and SA. By the end of 2022, the Islamic banking sector held assets

amounting to USD 2.25 trillion, up from USD 2.10 trillion in 2021 (Islamic Financial Service Board, 2023). It constituted a significant proportion of the global IFSI asset value at 69.3%, marking a slight increase from the 2021 figure of 68.7% (Islamic Financial Service Board, 2023). Significant Islamic banking assets hubs include the Gulf Cooperation Council (GCC), which accounts for 59.70% of the global Islamic banking system (1342.9 USD billion), followed by ME and SA at 21.27% (478.3 USD billion), SEA at 13.66% (307.2 USD billion), Africa at 2.20% (49.6 USD billion), and others at 3.17% (71.2 USD billion) (Islamic Financial Service Board, 2023). Table 1.1 presents the top 10 largest IBs in sample countries, ranked according to their total assets in 2022 (with missing values were imputed using interpolation methods for data completion). The total asset of the top 10 IBs in the sample was USD 1,854,782 million. The Islamic Republic of Iran held eight positions among the top 10 largest IBs in the sample countries. These banks account for about 82.53% of the total assets of the top 10 IBs. Bank Mellat, with assets of USD 338,561 million (18.25%) is at the top of the list, followed by Bank Melli Iran and Al Rajhi Bank with USD 288,491 million (15.55%) and USD 203,098 million (10.95%) respectively. The Bank of Industry and Mine has a total asset of USD 117,204 million (6.32%) and is ranked last among the top 10.

Table 1.1 : List of the Top 10 Largest IBs in the Sample Countries in Year 2022

Rank	Bank	Country	Asset (m USD)
1	Bank Mellat	Islamic Republic of Iran	338,561
2	Bank Melli Iran	Islamic Republic of Iran	288,491
3	Al Rajhi Bank	Saudi Arabia	203,098
4	Bank Tejarat	Islamic Republic of Iran	182,495

Table 1.1 : Continued

Rank	Bank	Country	Asset (m USD)
5	Bank Saderat Iran	Islamic Republic of Iran	181,618
6	Pars Aryan Investment Company	Islamic Republic of Iran	158,861
7	Bank Pasargad	Islamic Republic of Iran	142,678
8	Refah Kargaran Bank	Islamic Republic of Iran	120,981
9	Kuwait Finance House	Kuwait	120,795
10	Bank of Industry and Mine	Islamic Republic of Iran	117,204

(Source: Bankfocus database)

Based on total assets, the top 10 CBs in the sample countries in 2022 are listed in Table 1.2. The total asset of the top 10 CBs in the sample is USD 2,956,545 million. DBS BANK LTD is the biggest CB in the sample countries, with total assets of USD 553,719 million (18.73%).

The conclusion that can be drawn is that even in these three main Islamic hub regions, the top 10 assets of CBs are slightly larger than that of IBs.

Table 1.2 : List of the Top 10 Largest CBs in the Sample Countries in Year 2022

Rank	Bank	Country	Asset (m USD)
1	DBS Bank Ltd	Singapore	553,719
2	Oversea-Chinese Banking Corporation Limited OCBC	Singapore	416,448
3	United Overseas Bank Limited	Singapore	375,026
4	Qatar National Bank (Q.P.S.C.)	Qatar	326,708
5	First Abu Dhabi Bank	United Arab Emirates	302,261
6	Saudi National Bank	Saudi Arabia	252,132
7	Malayan Banking Berhad - Maybank	Malaysia	214,777

Table 1.2 : Continued

Rank	Bank	Country	Asset (m USD)
8	Emirates NBD Bank PJSC	United Arab Emirates	202,031
9	National Bank of Egypt	Egypt	177,023
10	T.C. Ziraat Bankasi A.S.	Turkey	136,420

(Source: Bankfocus database)

Despite several distinctions between CBs and IBs, such as disparities in asset levels among the nations in the current study's sample, both types of banks in the global financial system base their core functions around the effective allocation of resources and risk management. Banking efficiency is now one of the most important criteria in determining the success of banks' operations as financial markets become more complex. In addition to its effect on profitability, bank efficiency is essential for both the stable growth of the macroeconomy and the efficient use of financial resources.

1.2.2 Country Governance

Prior research has demonstrated a significant association between the external regulatory environment and the efficiency of entities (Altenburg et al., 2017; Aryeetey & Ahene, 2005). The CG-shaped regulatory environment has a direct impact on banks' operational and allocation efficiency, which in turn affects their overall efficiency and ability to contribute to economic stability. CG is a key component that affects efficiency in this process. Kaufmann et al. (2009, 2010) argue that CG can be clustered into three main categories. The first concerns how governments are chosen, overseen, and changed, which includes voice and accountability (VA) and political stability and absence of

violence (PV). Secondly is how governments govern and the quality of governance, which include government effectiveness (GE) and regulatory quality (RQ). Lastly is how citizens participate in governance and their respect for institutions, which include the rule of law (RL) and control of corruption (COC). Together, these factors influence the regulatory environment in which banks function, impacting their ability to minimise risks, maintain compliance, and allocate resources as efficiently as possible.

Strong COC suggests an overly regulated workplace for managers, whose goals could change from fixing market imperfections to furthering personal interests, ultimately lowering productivity (Kamarudin et al., 2022). Strong VA, on the other hand, fosters democracy and aids in the eradication of poverty, which increases productivity (Kamarudin et al., 2018). The regulatory environment, policy implementation, and legal framework for banks are all directly impacted by the level of governance, and these factors have a significant impact on the banks' ability to manage risk, allocate resources efficiently, and compete in the financial market as a whole.

Based on the study of Barbier and Burgess (2021) and Luo et al. (2024), the average of six dimensions of CG act as the proxy of CG. Figure 1.1 presents the trend of CG in three regions. As can be observed the figure, the level of CG in SEA and SA has experienced fluctuations but shows an overall upward trend. In contrast, the level of CG in ME has also experienced fluctuations but shows an overall downward trend.

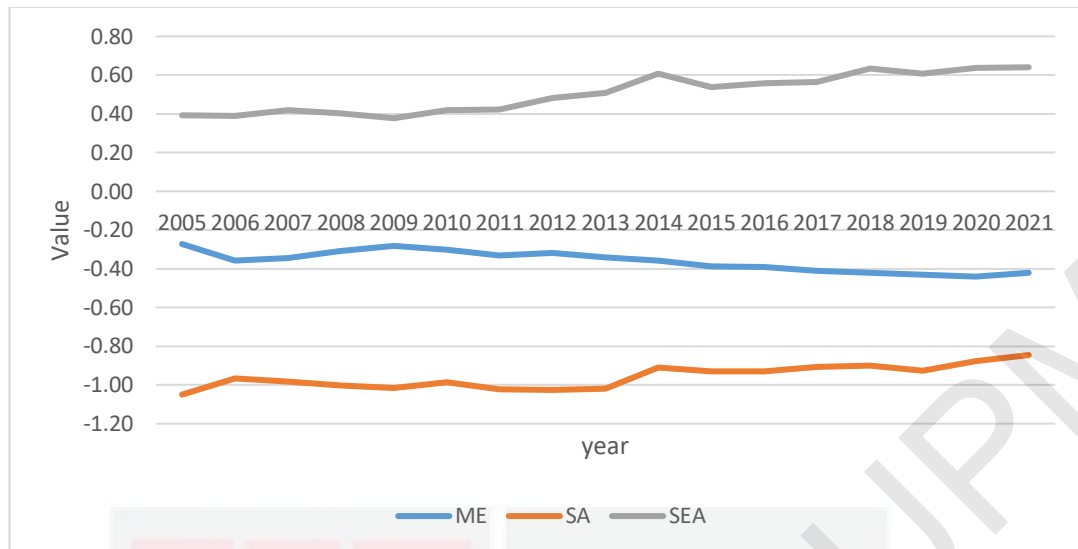


Figure 1.1 : Country Governance of the Sample Region for Years 2005 to 2021
(Source: Worldwide Governance Indicators)

1.2.3 Globalisation

Globalisation is commonly defined as the process of increasing interconnectedness and interdependence among societies, economies, and cultures worldwide. This process involves the flow of information, capital, people, and culture across borders, as well as interactions and influences among nations, businesses, and individuals on a global scale (Sufian & Kamarudin, 2016). Globalisation is essential to improving banks' competitive edge and efficiency (Sufian, 2016; Sufian & Kamarudin, 2016). Similar to more conventional elements like labour quality, capital sufficiency, and technology innovation, globalisation is now seen as a strategic enabler for financial institutions. Globalisation's strategic importance is becoming more and more clear in areas like exposure to international best practices, cross-border investments, and access to varied financial markets, all of which enhance risk management and operational efficiency (Gaies & Jahmane, 2022; Liu et al.,

2023; Sufian & Kamarudin, 2016). Furthermore, as a transformative economic force, globalisation is displacing traditional boundaries with the acceleration of financial integration and the growth of international trade. This allows banks to access dynamic markets, optimise resources, and diversify their portfolios (Liu et al., 2023; Yao et al., 2021).

As can be observed in Figure 1.2, globalisation in all three regions has experienced fluctuations. Ghosh (2016) concludes that financial globalisation has accelerated during the last 20 years, especially in developing nations with lower average incomes and dynamic markets. Globalisation offers banks enhanced access to capital, the ability to diversify their portfolios across various markets and regions, and exposure to different cultures. All the above make globalisation an important factor in influencing bank efficiency.

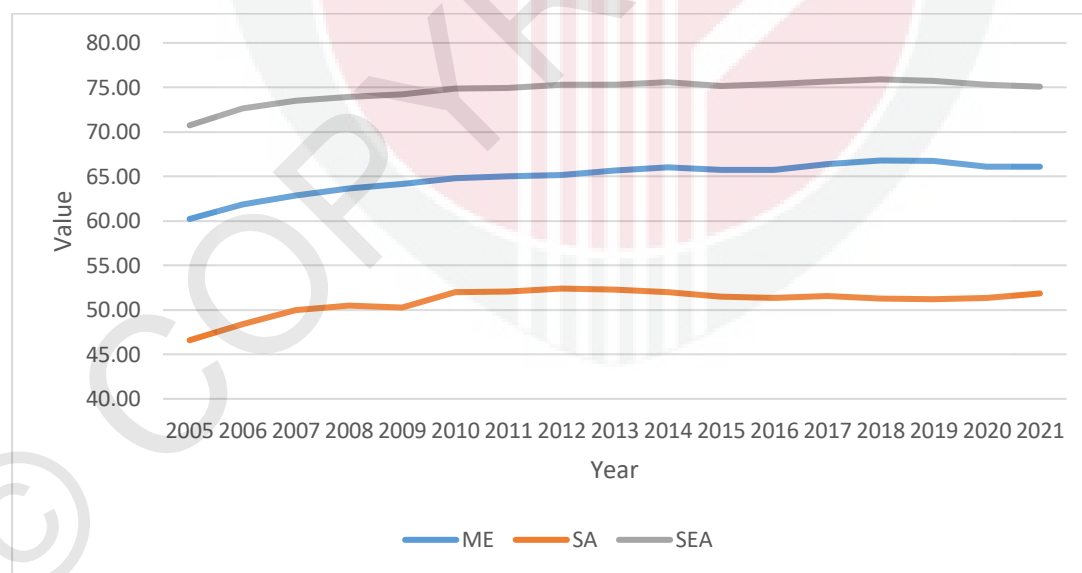


Figure 1.2 : Globalisation of the Sample Region for Years 2005 to 2021
(Source: KOF Globalisation Index)

1.2.4 Economic Policy Uncertainty (EPU)

EPU refers to the uncertainty caused by ambiguous or unpredictable economic policies, which can arise from changes in government regulations, tax laws, trade policies, and monetary interventions (Gignarta et al., 2024). Nowadays, EPU is acknowledged as one of the main causes of market volatility, which includes shifting regulations, tax laws, and monetary interventions. Its strategic influence on microscopic individuals is becoming increasingly evident, as it affects institutions' ability to allocate resources, manage risks, shape investors' decisions, and influence individual behaviours (Shabir et al., 2022; Shabir, Jiang, Shahab, et al., 2023; Wei et al., 2022). Higher EPU can also result in tighter lending requirements, less liquidity, and a reassessment of risk portfolios, all of which can affect banks' operating plans.

EPU has become an increasingly critical factor that influences the efficiency of banks. As an important aspect of the macroeconomic environment, EPU can significantly affect the stability and decision-making processes within the banking sector (Bilgin et al., 2021; Danisman & Tarazi, 2024; Nguyen, 2021). High EPU makes it difficult for banks to predict the state of the economy, which impacts their capacity to manage risks, allocate resources, and maintain profitability. Due to their worldwide interconnectedness, banks are particularly susceptible to external policy shocks that can spread internationally and increase uncertainty. Therefore, in an era of increased global economic interconnection, preserving stability and efficiency in the banking sector requires a grasp of the effects of EPU.

The World Uncertainty Index (WUI) was constructed by Ahir et al. (2022) using frequency counts of the term 'uncertainty' (and its variants) in quarterly Economist Intelligence Unit reports. This index is widely used by researchers (Cheng, 2019; Fang et al., 2022) as a proxy for EPU. Data from the WUI (Figure 1.3) indicate that the level of uncertainty has increased, and its volatility has grown since 1990. Put succinctly, the crisis increased economic uncertainty (Moore, 2017). The increased ambiguity around economic policy, in turn, made the crisis more severe and hindered recovery efforts (Arbatli et al., 2017).

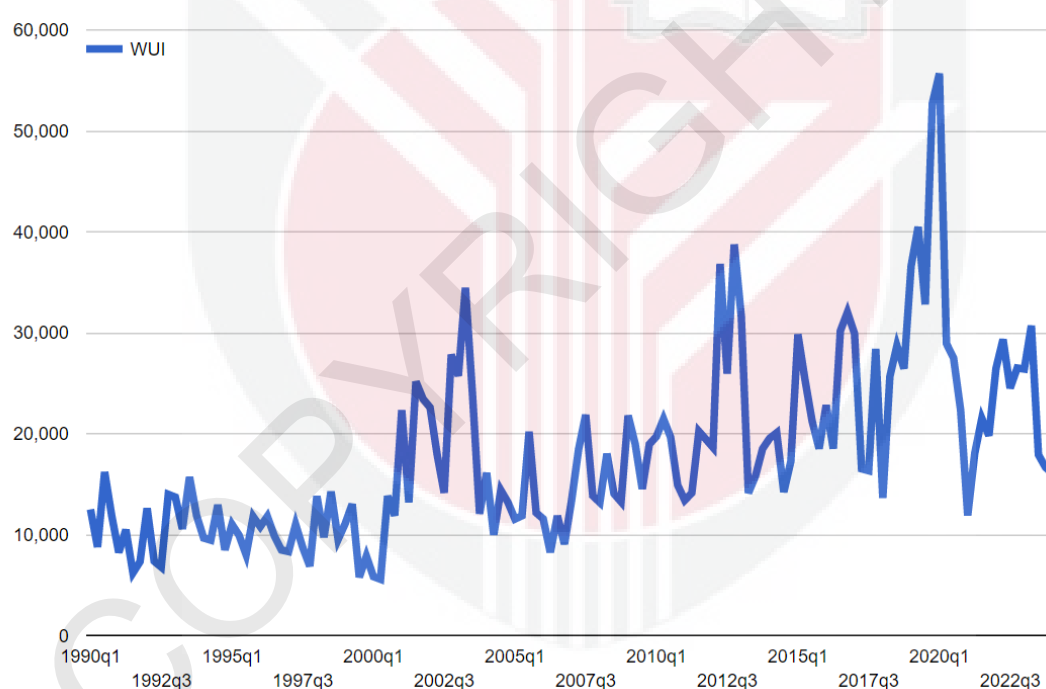


Figure 1.3 : World Uncertainty Index (WUI): Global Index. GDP Weighted Average. 1990Q1 to 2024Q1
(Source: <https://worlduncertaintyindex.com/>)

In the current study, the WUI data was aggregated quarterly to the EPU index. Figure 1.4 depicts the EPU levels in these regions from 2005 to 2021 while Table 1.3 shows the EPU levels in these regions. The EPU levels in all three

regions have been volatile, with the ME region's EPU levels being higher than the other two regions for most of the observation years.

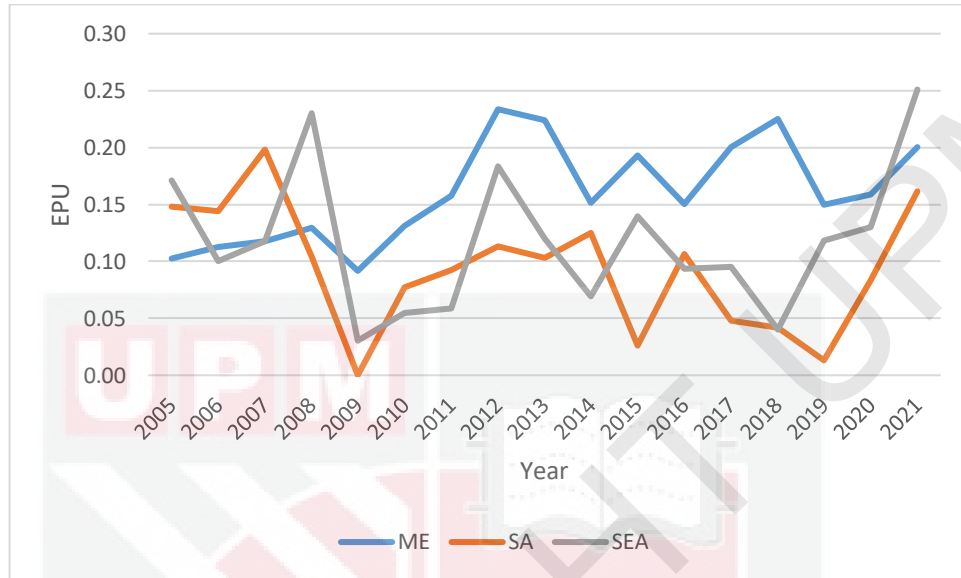


Figure 1.4 : EPU of the Sample Region for Years 2005 to 2021

Table 1.3 : EPU of the Sample Region for Years 2005 to 2021

	ME	SA	SEA
2005	0.10	0.15	0.17
2006	0.11	0.14	0.10
2007	0.12	0.20	0.12
2008	0.13	0.10	0.23
2009	0.09	0.00	0.03
2010	0.13	0.08	0.05
2011	0.16	0.09	0.06
2012	0.23	0.11	0.18
2013	0.22	0.10	0.12
2014	0.15	0.12	0.07
2015	0.19	0.03	0.14
2016	0.15	0.11	0.09
2017	0.20	0.05	0.10
2018	0.22	0.04	0.04
2019	0.15	0.01	0.12
2020	0.16	0.08	0.13
2021	0.20	0.16	0.25

1.3 Problem Statement

CG is a significant factor that influences bank efficiency globally. There are notable disparities in the results of CG despite the substantial research conducted on the subject. Some studies suggest that regions with higher levels of CG tend to have more efficient entities. For instance, Alam et al. (2020) argue that COC enhances ethical standards, expedites the efficiency of officials, and ultimately enhances business performance. Orudzheva et al. (2024) conclude that implementing COC helps companies reduce waste, manage resources more effectively, and encourage sustainability. Besides that, Kamarudin et al. (2018) argue that VA's efforts to promote democracy and eradicate poverty through the involvement of officers and citizens may have led to a rise in efficiency.

Some research have provided contrastive results on the impact of CG on entities is not as expected. For example, COC was found to not increase productivity in Vietnam (Le et al., 2021). In this kind of economy, bribery frequently acts as a dependable way to obtain limited government resources in dysfunctional market conditions, enabling businesses to get around government flaws. Kamarudin et al. (2022) argue that COC reduces bank productivity. Strong supervisors or regulators may also prioritise advancing their personal interests over resolving market failure. Bougatef (2017) contends that corruption can increase bank probability. A lack of intense competition among banks can lead to loan-related corruption, as banks may exploit such corruption to increase their profits. Cordella and Yeyati (1998)

argue that information disclosure could potentially worsen a company's situation as lack of financial expertise will lead to misunderstandings.

Without effective CG, banks cannot operate transparently, allocate resources efficiently, or manage risks appropriately. Strong governance frameworks create the necessary environment for banks to optimise their operations and enhance overall efficiency. On the other hand, poor governance, such as low level of COC, may provide gains by allowing banks to bypass regulatory or market constraints. This indicates that CG is essential for ensuring that banks operate in a manner that not only enhances their own efficiency but also supports broader economic stability. Therefore, more research is necessary to fully understand how CG affects bank efficiency. As SEA (Aljunied, 2019; Chowdhury & Haron, 2021; Lebdaoui & Wild, 2016; Mansoor Khan & Ishaq Bhatti, 2008), SA (Khan et al., 2018; Mishra, 2012), and ME (Ben Othman & Mersni, 2014; Hassan et al., 2009) act as central hubs for Islamic banking and finance, this study seeks to investigate the impact of CG on the efficiency of both IBs and CBs in these three main Islamic hubs.

One of the most popular issues in economics among scholars, decision-makers, and the public is globalisation. The term "globalisation" was originally used in economic literature by Naisbitt and Bisesi (1983) and Levitt (1983), who describe the transition from domestically operating businesses to international market participants. For micro-level businesses, globalisation has a significant effect on how well they function. Nonetheless, there are significant differences in how its effects are currently understood. Liu et al.

(2023) argue that economic globalisation tends to boost technological innovation and promotes more significant economic growth. Gaies and Jahmane (2022) point out that financial globalisation increases bank profitability. Bank profitability improves as a result of deeper integration into the global economy, which also expands banks' deposits, financial resources, and customer base.

International information significantly reduces transaction costs globally, facilitating international trade. Interpersonal globalisation eliminates barriers that previously hinder banking operations, which increases bank efficiency (W Jubilee et al., 2022). Hussain et al. (2021) argue that information globalisation increases the efficiency of microfinance institutions as the quick flow of information in complex interactions speeds up the operations of business organisations. However, Yakubu and Bunyaminu (2022) argue that financial globalisation decreases bank profitability. Due to the increase in the number of banks in the market that are driven by financial globalisation, the banking sector has become more competitive, which in turn may have reduced efficiency. Sufian and Kamarudin (2016) also point out that the impact of information globalisation on bank performance is negative, as institutions with lower skill levels typically perform worse due to the growing influx of information. Excessive protocols and complicated procedures brought about by cultural globalisation have also led to a reduction in bank productivity (W Jubilee et al., 2022).

Without globalisation, the banking sector would face limitations such as restricted market access, higher transaction costs, and reduced competition, ultimately hindering efficiency. However, globalisation also brings challenges, including heightened competition, information overload, and increasingly complex regulatory environments, all of which can negatively impact bank efficiency. This indicates that globalisation plays a crucial role in bank performance, and its effects are multifaceted, warranting a more detailed examination to fully understand its impact. The operation of banks becomes increasingly challenging, especially in the era of globalisation (Krech et al., 2018). Consequently, this study seeks to investigate the impact of globalisation on the efficiency of both types of banks' efficiency in these three main Islamic hubs.

The GFC was a major event that not only caused unprecedented challenges for banks but also significantly contributed to the rise in EPU. The crisis exposed vulnerabilities in the global financial system, leading to heightened uncertainty regarding economic policies and government interventions, which in turn increased the level of EPU. The crisis originated from the banking sector (Dungey & Gajurel, 2015), which was characterised by a cascade of events including the collapse of major financial institutions, liquidity shortages, and a credit crunch (Bernanke, 2018). There was a tremendous deal of ambiguity over how policymakers should react, as well as the potential economic fallout. With the increased uncertainty level, energy efficiency in China (Li et al., 2021; Wei et al., 2022), firm efficiency (Doan et al., 2020; Tarkom & Ujah, 2023b), informational efficiency in US (Frijns et al., 2023), and

labour investment efficiency (Luo et al., 2020) were reduced. Besides that, higher uncertainty became negatively correlated with bank lending (Shabir et al., 2022), bank stability (Nguyen, 2021) and bank profitability (Ozili & Arun, 2023). In terms of banks' efficiency, the likelihood of loan defaults rose during high EPU periods as consumers and companies became more cautious about the direction of the economy.

Bank efficiency can be negatively impacted by uncertainty through more cautious lending practices, greater default rates, and more provisioning for bad loans (Deng et al., 2023; Shabir et al., 2021). Ignoring EPU, banks may not need to maintain large buffers of liquidity, potentially allowing for more funds to be allocated to lending and investment operations. This oversight could expose banks to greater risks, ultimately diminishing their efficiency as they face challenges in managing cash flow and potential defaults. Besides that, without considering EPU, there will be a higher risk of financial instability, as the absence of sufficient liquidity could make it more challenging to manage cash flow risks in times of uncertainty. This lack of liquidity management could ultimately hinder overall bank efficiency. However, few studies have examined the moderating effect of EPU on bank efficiency. Thus, the study intended to answer the following question: in the three main Islamic banking hubs, will EPU moderate the impact of CG and globalisation on the efficiency of both types of banks?

1.4 Research Questions

Based on the above discussion, this thesis answers the following questions:

- i. Does CG affect CBs' and IBs' efficiency?
- ii. Does globalisation affect CBs' and IBs' efficiency?
- iii. Does EPU significantly moderate the impact of the CG on the efficiency of the two types of banks?
- iv. Does EPU significantly moderate the impact of the globalisation on the efficiency of the two types of banks?

1.5 Objectives of the Study

The general objective is to examine the impact of CG and globalisation on the efficiency of the two types of banks, as well as the moderating effect of EPU, on the above nexus. In detail, the objectives of the study are:

- i. To examine the impact of CG on CBs' and IBs' efficiency in ME, SEA and SA.
- ii. To examine the impact of globalisation on CBs' and IBs' efficiency in ME, SEA and SA.
- iii. To investigate the moderating effect of EPU on the impact of CG on CBs' and IBs' efficiency in ME, SEA and SA.
- iv. To investigate the moderating effect of EPU on the impact of globalisation on CBs' and IBs' efficiency in ME, SEA and SA.

1.6 Significance of the Study

The banking industry is one of the most important sectors in the context of global economic dynamics. Banks play a fundamental role in the economy by

providing financial services that facilitate economic transactions, investment, and growth. The efficiency of the banking sector is crucial as it directly impacts the allocation of resources, the flow of capital, and the overall stability of the financial system. While inefficient banks may impede growth by improperly distributing resources or failing to adequately manage risks, efficient banks make sure that funds are dispersed in a way that promotes economic progress. As a result, a country's overall economic health can be impacted by the efficiency of banks.

The external context in which banks function is represented by CG, globalisation and EPU. CG includes the political, legal, and institutional frameworks that govern the behaviour of organisations, including financial institutions. Globalisation encompasses various dimensions such as trade, finance, information, interpersonal, and cultural globalisation. It refers to the increasing interconnectedness of economies, markets, and societies worldwide. EPU pertains to the unpredictability of government policies, particularly economic and financial regulations. All these external factors—CG, globalisation, and EPU—interact and collectively influence the efficiency of banks. Therefore, this study focuses on the effect of CG and globalisation on bank efficiency and the moderating role of EPU on the above nexus by analysing CBs and IBs in three main Islamic hubs. The following factors represent this study's specific implications.

Firstly, this study contributes to the literature on bank efficiency. Although numerous studies have investigated the impact of CG on price efficiency,

revenue efficiency, and productivity in both CBs and IBs, there is limited research on the impact of CG on bank efficiency in the three main Islamic hubs. Furthermore, while the impact of globalisation on bank productivity and performance has been widely explored, studies specifically addressing the impact of globalisation on bank efficiency in these hubs are scarce. Additionally, research on the moderating role of EPU in the relationship between CG and bank efficiency, as well as between globalisation and bank efficiency, is also limited. This study is the first to examine the moderating effect of EPU on the relationship between CG and bank efficiency, as well as between globalisation and bank efficiency. It provides valuable insights for enhancing the efficiency of both CBs and IBs.

Second, by shedding light on the relationship between bank efficiency and CG, globalisation, and EPU, this study helps policymakers and financial institutions make better decisions. The significance of CG in influencing bank performance has grown significantly in importance as the world's financial markets become more interconnected. A solid legal, political, and institutional framework brought about by strong national governance helps banks manage risks, allocate resources efficiently, and conduct business openly—all of which are essential for increasing bank efficiency. Furthermore, banks are significantly impacted by globalisation, which has an impact on trade, finance, information, and cultural interchange. This is because it increases competition, expands market opportunities, and changes operational tactics. However, the growing ambiguity around EPU presents difficulties that may interfere with banks' ability to allocate resources and make decisions. From a practical

perspective, this study intends to increase bank managers' understanding of the strategic role that CG plays in influencing efficiency, the effects of globalisation on their business operations, and the necessity of tackling the difficulties brought on by the unpredictability of economic policy. It provides information that banks can use to improve their resilience and efficiency in a changing global environment.

Based on the literature review, there is a dearth of studies on the connections between EPU, CG, and globalisation in the banking sector in the three main Islamic hubs. Thus, in addition to adding to the body of knowledge, this study can shed more light on how EPU moderates CG and bank efficiency as well as globalisation and bank efficiency.

1.7 Scope of the Study

The ME, SEA, and SA are important regions with strategic and growing financial markets. These regions host a substantial portion of global Islamic banking activity, where both IBs and CBs coexist. Given the importance of these regions in the global financial landscape, examining the impact of CG, globalisation, and EPU on the banking sector is of great relevance. In order to maintain homogeneity, this study only investigated CBs and IBs.

Final data consisted of 353 CBs and 110 IBs. The Bankfocus database, collected by the Bureau van Dijk, was utilised where balance sheets and other financial indicators of banks could be located as the source of bank data from

2005-2021. The data envelopment analysis (DEA) method was used in the first stage of the analysis to calculate bank efficiency.

Besides elements for calculating efficiency, other factors that were determined as able to influence the efficiency of the two types of banks are bank-level factors and country-level factors. Due to the availability of data, three elements were included at the bank level: capitalisation (equity/total assets), bank size (natural logarithm of total assets), and the quality of loan (loan loss reserves/gross loans). Data from the World Bank was utilised to gather country-level information such as GDPG (annual %) and consumer price index (CPI). Additionally, this study incorporated COVID as the dummy variable. These bank-level and country-level variables served as control variables.

Furthermore, this study employed the pooled ordinary least square (OLS), fixed effect model (FEM), and random effect model (REM) estimation methods to examine the connections between variables. Breusch Pagan (BP) and Lagrangian Multiplier (LM) tests were used to identify whether the data were suitable to be pooled or panel, followed by the Hausman test to classify between FEM and REM. Furthermore, to obtain a robust result, the study also employed the instrumental variables two-stage least squares (IV-2SLS) technique to control for endogeneity problems.

The data used in this study were drawn from Bankfocus, which unfortunately lacked bank-level data from 2005. This restriction was important as it limited the breadth of the investigation, especially when considering the efficiency of

banks. Furthermore, the research was further reduced by the inclusion of data on CG, globalisation, and EPU, which resulted in a sample size that was restricted to banks in 15 countries. Therefore, even though the goal of the current study is to provide a thorough analysis of how CG, globalisation, and EPU affect bank efficiency, the results were inevitably limited by the data's accessibility and the sample's geographic reach. Future research could explore alternative indicators or data sources to broaden the focus and possibly yield more broadly applicable findings.

1.8 Organisation of the Thesis and Research Framework

Chapter One comprises the introduction, background of the study, problem statement, research questions, objectives of the study, significance of the study, and scope of the study. Chapter Two reviews the literature on the research, while Chapter Three focuses on the methodology, empirical model, sources of data, and description of variables. The presentation and analysis of the findings are included in Chapter Four. Chapter Five summarises the findings and discusses policy suggestions, constraints, and suggestions for further research.

In addition, the research framework for this study is shown in Figure 1.5.

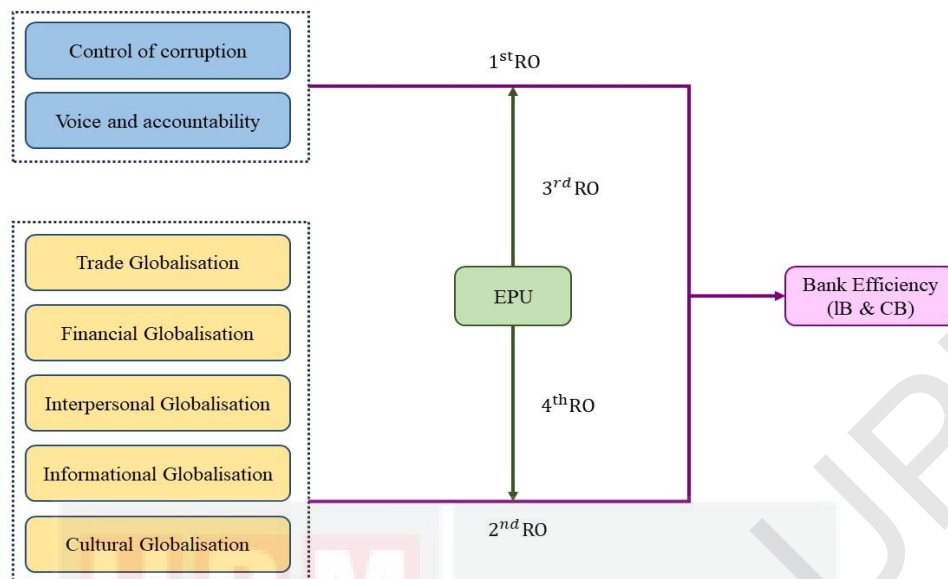


Figure 1.5 : Research Framework

1.9 Chapter Summary

Chapter 1 introduced the study by providing the background and context for exploring the efficiency of CBs and IBs, with a particular focus on the role of CG, globalisation, and EPU. It highlights the significance of these factors in shaping the efficiency of financial institutions. The problem statement identifies key gaps in the literature, while the research questions and objectives clarify the direction of the study. The chapter also discusses the relevance of the study, its contributions to the field, and the study scope. Lastly, the organisation of the thesis and research framework provides a structured approach to the ensuing analysis.

Building on the foundational elements introduced in this chapter, Chapter 2 will review the existing literature related to the key concepts of bank efficiency, CG, globalisation, and EPU, establishing the theoretical framework for the study.

CHAPTER 2

THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

2.1 Introduction

This chapter provides a comprehensive overview of the relevant literature based on the topics explored in Chapter 1. The review is supported by theories and empirical research that have been published and approved by prominent academics. There are four primary categories in this chapter: bank efficiency, EPU, globalisation, and CG. In this chapter, the knowledge gaps in existing literature are addressed to obtain a thorough grasp of the relationship between bank efficiency, EPU, globalisation, and CG. This study aims to enrich earlier studies and advance knowledge in this area by synthesising the available literature.

2.2 Theoretical Framework

Given that this study focuses on bank efficiency as the dependent variable, it is essential to first examine efficiency theories. This study adopts the Cobb Douglas Production theory, which is the most common theory, to explain the efficiency of IBs and CBs. While investigating the impact of CG on efficiency, the Theory of Regulation was used to explain the underlying mechanisms. Next, several theories were used to explain the impact of globalisation on efficiency. Finally, the Uncertainty Theory was utilised to explain the moderating impact of EPU on the impact of CG and globalisation on the efficiency in IBs and CBs.

2.2.1 Theory of Cobb Douglas Production

Cobb and Douglas (1928) attempted to assess changes in the labour and capital inputs that are required to produce the volume of goods and identify any linkages that may exist between labour, capital, and product. They developed a function as follows:

$$Q_t = f(x_t) + \varepsilon \quad (2.1)$$

$$x_t = K_t L_t \theta_t \varepsilon \quad (2.2)$$

Where;

Q_t = the actual output,

x_t = the corresponding vector of inputs that consist of K_t (capital), L_t (labour),

θ_t (set of other factors that are involved) and ε (random error term).

The function succinctly reflects some important concerns of economists as the theory lays the foundation for subsequent efficiency analysis. Based on the theory, the function that gains the most outputs in a given input is the frontier production function (Aigner & Chu, 1968), which can be considered as the best practice to measure efficiency. Farrell (1957) was the first to propose efficiency to measure the distance between the production point and the production frontier. The input-output ratio was used to measure whether an enterprise had fully utilised the existing factors of production.

Another measure of efficiency is productivity (Bain, 1982), which is an indicator of how effectively resources are combined and used to produce outputs. Based on the definition of productivity, Ruch (1982) proposed several ways to

improve productivity. However, scholars face several challenges in applying efficiency analysis to firms. For instance, the study by Farrell (1957) only measured the production efficiency of a single input and a single output, as this measurement is not applicable to multi-input and multi-output production. Burgess (1990), therefore, raised doubts on the definition and measurement of productivity.

Berger and Humphrey (1997) applied the model conceived by Cobb and Douglas (1928) to the banking sector for the purpose of analysing the efficiency of financial institutions. In this case, a functional financial sector is considered better able to allocate resources and ensure that money flows to the most successful and deserving businesses to further support economic growth.

2.2.2 Theory of Regulation

2.2.2.1 Grease the Wheels Theory

COC measures the level of controlling the use of public authority to achieve private gain, as corruption is generally seen as a barrier to better development. However, Leys (1965) raised concerns about this. Additionally, scholars like Beck and Maher (1986) and Lien (1986) posit that corruption may be positively correlated with efficiency, as the problems caused by dysfunctional systems may make corruption seem advantageous (Leff, 1964). Bardhan (2017) also cited instances from developed countries' history that show how corruption may have aided growth by enabling firms to get around bribers.

The "Grease the Wheels" theory is the most widely accepted defence of corruption's positive benefits. According to this theory, ineffective bureaucracy impede investment, and specific types of "accelerating" or "lubricating" money can assist in getting around these barriers. Simply put, the theory suggests that corruption could be a practical way to increase productivity. Corruption can counteract poor bureaucratic functioning, enhance the calibre of public servants, and improve officials' ability to make optimal decisions. This is because officials maybe be encouraged to expedite procedures through bribes; without bribes, the process would be slow (Leys, 1965; Lui, 1985). Since corruption in utility companies could help bypass onerous bureaucratic rules, this leads to faster growth (Huntington, 2006). Without the additional income that bribery provides as a supplement, competent officials may then choose to work in another field (Bayley, 1966; Leys, 1965). Therefore, corruption can raise the calibre of officials, thereby improving administrative efficiency. In addition, corruption can increase the likelihood of officials making better choices (Beck & Maher, 1986; Lien, 1986). When the market lacks sufficient information to distinguish between high and low-performing entities, the amount of bribery can serve as a measure of a company's efficiency, thus enabling officials to make more informed decisions. A study by Leff (1964) also suggests that licenses are often allocated to those who offer more bribes, as they tend to be more capable.

The examples cited below provide evidence that corruption may have positive economic and political consequences. Bayley (1966) argues that when public policies are ineffective, bribery can serve as a supplement. Corrupt practices

can thus restrict their negative impacts by merely obstructing ineffective regulations. If there is less ambiguity about investment initiatives, corruption might result in better economic consequences (Yung et al., 2023). As such, the conventional wisdom that corruption hinders investment and growth is not refuted by this hypothesis. The idea suggests that corruption may be beneficial in nations with ineffective aspects of governance but harmful in others.

2.2.2.2 Principal-Agent Theory

VA encompasses opinions on how much a nation's citizens may influence the choice of their government and express freedom of ideas. The most suitable theory for this index is the Principal-Agent theory (Fama, 1980). According to the Principal-Agent theory, a possible conflict of interest between shareholders and the management of a company results from the separation of ownership and control in the firm (Fama, 1980). More specifically, in scenarios involving public interest, the public acts as the principal, while officials serve as the agents. In an ideal situation, the interests of government officials would align directly with those of the public. However, the reality is often the opposite, as officials tend to focus on their own interests, or those of a small segment of the population, rather than the interests of the majority (Adsera et al., 2003). The absence of principals from day-to-day activities may lead to issues of information asymmetry, including problems related to moral hazard and adverse selection. These factors can potentially impede organisational efficiency. Rent-seeking, for example, is a common practice that impedes organisational efficiency, as it involves obtaining benefits at the expense of the broader public's interests (Benson, 1984).

Several researchers have demonstrated that election can be a useful tool for maintaining the principal-agent problem in public affairs (Adsera et al., 2003; Ferejohn, 1986). If public voting could determine officials' appointments, then voting based on political performance would encourage officials to improve governance (Adsera et al., 2003). The Public Choice Theory also suggests that the direction and strength of government policies are closely tied to the interests of those who hold voting power, rather than being aligned with the best interests of the public (Nordhaus, 1975).

However, elections are not always effective, and their outcomes may actually vary depending on a variety of factors. Adsera et al. (2003) argue that the level of democracy and the availability of public information are key factors that matter. As the level of democracy increases, government officials' accountability should improve, and rent-seeking behaviour should decrease. The availability of information to the public is negatively correlated with government inefficiency, which in turn reduces rent-seeking.

2.2.3 Other Competing Theory

Starting with the dysfunction of bureaucracy, the Grease the Wheels theory posits that corruption may help expedite an "exogenously" slow procedure, suggesting a potential beneficial effect of corruption in reducing bureaucratic delays. However, the concept of slowness itself might not necessarily exist; instead, it could be artificially created by civil servants seeking to extract bribes (Myrdal, 1972). Additionally, the cause of delays could stem from multi-tiered decision-making mechanisms, where each level of civil servants contributes,

to varying degrees, to overall inefficiency. Shleifer and Vishny (1993) point out that the cost of bribery to obtain project authorisation is higher when facing multiple agents compared to dealing with just one. Jain (2001) pointed out that when everyone uses bribery, the speed does not rise but rather the volume of transactions increases in comparison to the initial speed without bribery. Therefore, bribery, as a form of distortion, is detrimental to social development and has been summarised as the Sand the Wheels theory.

2.2.4 Theory of Trade

The focus of international trade theory is on how trade integration enhances the overall efficiency of economies. Trade globalisation enhances the range and quality of financial services and goods that are offered on the market (Tamirisa et al., 2000), and this enhancement also impacts the banking industry. As the range of trading partners expands and access to global markets broadens, the demand for effective banking systems to support trade financing, currency exchanges, and risk management increases.

According to the theory put forward by Schuh (1988), the benefit of trade liberalisation is that it allows a nation to employ its resources more effectively. The most widely used explanation of this is that it will allow the nation to capitalise on its comparative advantages, which are primarily described in terms of resource endowments, both natural (e.g. climate) and man-made (e.g. people and physical capital). Besides that, trade liberalisation has a favourable impact on a country's growth (Erkisi & Ceyhan, 2019; Manni & Afzal, 2012), income, and poverty-reduction (Winters & Martuscelli, 2014). The

studies by Grossman and Helpman (1991, 1993) also conclude trade can accelerate a nation's growth for several reasons. It facilitates the transmission of technology, makes a larger body of technological information accessible, encourages research, and prevents research duplication. Foreign direct investment (FDI) contributes capital, technology, and knowledge to economic growth. It allows access to international markets, fosters innovation, increases productivity, and generates jobs. Romer (2009) also argues that FDI has the ability to boost economic development and innovation rates in developing nations. The work of Keller and Yeaple (2009) concludes that FDI significantly increases domestic productivity due to technology spillovers. Reduced restrictions on foreign ownership and operations, along with improved regulatory frameworks, can make a country more attractive to foreign investors. Krueger (2019) argues that reduced restrictions have a positive impact on productivity, which inevitably contributes to higher wages and increased employment. Additionally, the impact of trade policy on productivity has been the subject of the works by Baggs and Brander (2004) and Trefler (2004).

2.2.5 Financial Development Theory

The process of removing official restrictions on the transfer of resources, including capital and trade, is defined as liberalisation (Caselli, 2012). Economic growth, investment, and cost of capital are all significantly impacted by liberalisation (Henry, 2007). When markets are liberalised, barriers to entry are reduced, allowing new entities to enter and existing entities to expand. By providing banks more access to global money, it improves their capacity to

manage assets, make loans, and provide new services. As a result, the advantages of economies of scale reduce intermediary costs, allowing banks to offer competitive products to customers (Gibson & Tsakalotos, 1994).

Competition is also encouraged by financial globalisation (Fu et al., 2010). This happens due to their need to increase their efficiency to draw in foreign investment and maintain their competitiveness in a globalised market. According to the theory put forward by Aghion et al. (2003), companies at different efficiency levels respond differently to liberalisation. On one hand, more efficient enterprises are prompted to increase their investments in technology adoption in response to the external competition brought by liberalisation. A higher level of liberalisation in turn leads to greater intensity of innovation in these efficient firms. Efficient firms can survive or deter entry by innovating. On the other hand, less efficient companies are at a disadvantage when facing competition brought by liberalisation. The benefits from their activities are then weakened.

2.2.6 Social Friction Theory

The term "friction" is defined as the mutual resistance (or opposing actions/thoughts) encountered when two or more entities from different countries come into direct contact (Luo & Shenkar, 2011). Geographical, historical, religious, and value-based variations among communities ultimately influence their formal and informal institutions, reflecting the basic circumstances of friction (Basuil & Datta, 2019; Luo & Shenkar, 2011; Ronen & Shenkar, 2013). This friction plays a critical role in shaping

interactions between local and international entities. First, the information asymmetry between local and international organisations is exacerbated by friction. It takes additional effort to manage these concerns because cultural and interpersonal friction make it harder for foreign companies to obtain resources and deal with problems locally (Jin & Wang, 2021). In addition, friction hinders the establishment of relationships between local and foreign entities, increasing the costs associated with social etiquette and relationship management (ROTTIG & REUS, 2009). Second, based on the concept of legitimacy defects, cultural differences can cause foreign entities to have cognitive legitimacy gaps, which exacerbates suspicion among local entities (Newbury et al., 2006; Xu et al., 2024). Such mistrust forces entities to rely on specific methods to address lack of trust, which in turn weakens efficiency.

2.2.7 Theory of Information Security

It is possible for data to travel across borders without either person realising it (Solove, 2009). In turn, data exchange improves efficiency, raising living standards and wellbeing (Kuner, 2010). However, countries face an increased risk of cyberattacks as the web becomes increasingly integrated into daily life (Aslan et al., 2023; Meltzer, 2015). In the case of information globalisation, the more banks interact with global data networks and share information, the greater the potential benefits (e.g., in terms of customer service or market insight). However, these externalities also lead to data security risks as more entities become involved in the information exchange process. As confirmed by Boer and Vazquez (2017) and Johnson (2015), the financial sector faces significant data vulnerabilities. In addition to the directly quantifiable costs,

there are also intangible consequences of data vulnerabilities such as the loss of customer trust, missed opportunities due to service interruptions, costs associated with detecting and rectifying incidents following cybercrime, the loss of confidential company data, and reputational damage to the compromised organisation (Lewis & Baker, 2013; Uddin et al., 2020). Besides, the data security events and news will increase the negative reaction of investors and lead to liquidity crunch (Das et al., 2012; S. Goel & Shawky, 2009).

As information technology progresses, it is imperative for the financial sector to invest in data protection (Kox, 2013). Although data risks cannot be completely eliminated through IT investments, they can be mitigated to some extent (Kesswani & Kumar, 2015). Another issue is that data security-related investments depreciate quickly due to the short lifespan of cyber technology and the rapid pace of its development (Uddin et al., 2020). In a nutshell, banks should balance the costs of purchasing the hardware, software, and system infrastructure required for data protection with the possible loss of customers brought on by data breaches (Böhme, 2010; Eling & Lehmann, 2018).

2.2.8 Theory of Uncertainty

According to the Theory of Equilibrium Value, commodities are homogeneous, and prices are determined by supply and demand. However, sometimes, the information owned by buyers and sellers is asymmetric (Abdelhafid & Mohammed, 2019). This issue is more pronounced in banking economics, where banks accept deposits from savers and transfer them to investors as

loans. Economic uncertainty can intensify information asymmetry between banks and borrowers and lead to risk aversion behaviours. Banks tend to engage in lower risk activities, leading to lower risks and lower returns (DeYoung & Roland, 2001; Meslier et al., 2014). Moreover, an increase in the level of information asymmetry leads to higher costs of monitoring and screening borrowers. This is because banks become more cautious about lending (Shabir et al., 2022), leading to decreased credit (Wu et al., 2021). This can reduce banks' efficiency as banks allocate more resources to risk management. In a nutshell, the scale of banking operations decreases as a result of the decreased demand for bank loans, prohibiting banks from taking advantage of economies of scale and requiring them to dedicate more effort in managing their clients

EPU also disrupts banks' customers and economic activities. Financial friction refers to the borrowing costs, monitoring costs, and information costs that arise in financial markets due to incomplete or asymmetric information (Calomiris & Ramirez, 1996). It causes an increase in external financing costs for companies. Uncertainty shocks can cause companies to depreciate their assets and take on more debt, which makes obtaining external financing more challenging. As a result, businesses are more likely to hold cash to deal with liquidity constraints and are less likely to invest (Bates et al., 2009). Companies experience a decline regarding their assets, which may be due to unexpected devaluation, which lowers the amount of collateral they can prepare for applying for new loans (Carrière-Swallow & Céspedes, 2013). Therefore, banks will offer less loans to the firms.

Tarkom and Ujah (2023) argue that firms may find it difficult to plan and run effectively when expected laws and practices are disrupted by uncertainty resulting from policy changes or unpredictable government actions. Moreover, economic activities tend to decline under uncertainty. For instance, D'Mello and Toscano (2020) highlight that firms' trade credit diminishes, while Krol (2018) observed reductions in products, services, and investments. Moreover, managing uncertainty takes priority, often causing governments to delay and refocus its efforts on addressing EPU (Jiang et al., 2019).

2.3 Evolution of Bank Efficiency Studies

2.3.1 Financial Ratios Approach

Based on the majority of earlier studies (Beccalli, 2007; Sherman & Gold, 1985), institutions' efficiency is assessed using financial ratios. Cost minimisation and profit maximisation are popular financial principles used to assess bank efficiency. In a given cost or profit, the way to maximise profit or minimise cost equals the way to gain efficiency. In this approach, financial ratios such as return on assets (ROA), return on average assets (ROAA), and cost-to-income ratios are utilised to measure efficiency. Using the data from financial reports, financial ratios like ROA and return on equity (ROE) can measure the advantages and disadvantages of a firm (Azhar Rosly & Afandi Abu Bakar, 2003). Furthermore, financial ratios are more readily accessible compared to elements used to generate DEA scores (Haddad et al., 2019). ROAA demonstrates the extent to which a bank efficiently uses its assets compared to other banks (Salike & Ao, 2018). The cost-to-income ratio

compares operational costs with operating income to assess efficiency (Haryanto, 2018). The cost-to-income ratio, which is computed as a proportion of the non-interest operating cost to total revenue, can be a proxy for efficiency (Albaity et al., 2019). Operating income is the main income of a bank as banks gain profit from offering loans and other items. If operating income is higher, then the bank's efficiency will be better (Sengkey et al., 2018).

While these conventional indicators provide valuable insights into bank performance, they are not without limitations. First, financial ratios like ROA are not appropriate to evaluate efficiency due to lowered overhead expenses (Azhar Rosly & Afandi Abu Bakar, 2003). Comparing ratios may also give a partial and misleading picture of how many resources are used to produce a certain output because some studies do not control product mix and input price effects (Berger & Humphrey, 1992). Cost minimisation and profit maximisation are also unlikely to be the Islamic banking sector's top priorities (Abdul-Majid et al., 2010). Second, this method may oversimplify the intricate dynamics of a bank's business. It does not give a thorough overview of the internal procedures and management techniques that increase overall effectiveness. Finally, accounting information disregards the bank's existing market worth and does not depict activity that maximises economic value (Kohers et al., 2000). In light of the aforementioned limitations, an approach called the Efficiency Frontier Approach can better measure an institution's performance, as noted by Berger and Humphrey (1997).

2.3.2 Efficiency Frontier Approach

This approach measures how a financial institution is expected to perform relative to the best-performing companies in the industry under the same market conditions. Empirical research has primarily employed two kinds of efficiency frontier approaches to evaluate banks' efficiency, namely non-parametric (mathematical-programming) and parametric (regression-based) approaches.

In terms of the latter, the Stochastic Frontier Analysis (SFA) is most common in this approach. SFA requires the production function to be built up beforehand, which may cause result divergence from model error (Wang & Yan, 2023). In terms of the former, the DEA is the most common in this approach. This method is used to assess the relative effectiveness of a group of comparable units, commonly known as decision making units (DMUs). This method has been used in the past to evaluate the relative effectiveness of non-profit institutions such as schools. However, it is now gradually being applied to research on the efficiency of profit-oriented organisations such as banks and logistics. Sherman and Gold (1985) applied this method in the bank for the first time. DEA can use multiple inputs and outputs to calculate an overall efficiency score without considering which ones are more or less important.

DEA determines which DMU forms a frontier surface. If one DMU is inside of the frontier surface, it can be considered inefficient. In this study, rather than attempt to correlate one bank's performance with financial ratios that may not be directly applicable to another bank, DEA determines whether a specific

bank is efficient or not by comparing it to other banks that are viewed as being comparable to it and hence considered to be efficient (Avkiran, 1999). Frontier surfaces can be classified into two categories: constant returns to scale (CRS) (Charnes et al., 1978) and variable returns to scale (VRS) (Banker et al., 1984). The efficiency score obtained under CRS is named technical efficiency (TE). The TE of banks refers to their capacity to convert various resources into various financial services (Bhattacharyya et al., 1997). In DEA, TE is usually divided into two subindices: pure technical efficiency (PTE) and scale efficiency (SE). These two subindices enable the exploration of the source of inefficiency. The PTE is based on the assumption of VRS as this method does not consider scale efficiency. Additionally, this index assesses the managerial performance in the daily operation of banks. $SE = TE/PTE$, which provides a measure of scale efficiency. SE helps to select the scale of production that can assess the expected production level. A bank's improper size (either too big or too little) can occasionally contribute to technical inefficiency. There are two types of technical inefficiency, namely decreasing returns to scale (DRS) and increasing returns to scale (IRS). DRS suggests that a bank is too big to fully benefit from the scale and may face disadvantages from the bigger size while IRS indicates that a bank is too small and experience economies of scale. If a bank works at CRS, then it can be considered as scale efficient.

There are several reasons for adopting the latter approach to access efficiency (Kumar & Gulati, 2008). Firstly, this method allows for the assessment of SE, PTE, and TE. Additionally, it shows whether banks are experiencing DRS or IRS. Secondly, before calculating the efficiency score, it is unnecessary to

assume the functional form such as the Cobb-Douglas functions. Thirdly, DEA can be employed in situations where there are multiple inputs and multiple outputs. Lastly, the user does not need to provide values for weights associated with input and output factors.

2.4 Literature Review

2.4.1 Efficiency of IBs and CBs

Several countries in the world have adopted a dual banking system, where Islamic and conventional banking systems coexist, such as Malaysia and the United Arab Emirates. In these countries, bank efficiency is important because it determines competitiveness and whether one kind of bank outperforms other kinds of banks. The concept of efficiency concerns how to maximise output in a given input or how to minimise input while the output is the same. Recently, the importance of bank efficiency has been given closer attention as the banking industry suffers from the GFC, COVID-19, globalisation, fierce competition, as well as an unpredictable regulation environment.

2.4.2 Control Variables

Two kinds of control variables affect the efficiency of banks in the dual banking system, namely bank-level and country-level control variables. Bank-level control variables such as the size of the bank (size), credit risk (quality), and capitalisation (capital) are internal factors. Meanwhile, country-level control variables such as economic growth (GDPG), CPI, and COVID-19 are considered country-level factors.

2.4.2.1 Bank-level Control Variables

2.4.2.1.1 Size of the Bank

A wealth of studies have supported the two contradictory views about the relationship between the size of the bank and efficiency. On one hand, larger banks may benefit from economies of scale, resulting in improved efficiency (Alqahtani et al., 2017; Barth, Lin, et al., 2013; Belasri et al., 2020; Izzeldin et al., 2021; Otero et al., 2020; Staikouras et al., 2008). Bank asset growth within a certain range has a positive effect on efficiency (Eichengreen & Gibson, 2001). Besides that, good management is associated with a larger size (Rosman et al., 2014). On the other hand, a significant asset base can lead to lower efficiency due to the complex organisational structure and multi-tiered management. Due to their failure to collect all feasible rent, larger banks with greater market power fare worse than smaller banks (Koetter et al., 2012). Small banks have closer proximity to their customers, enabling them to assess their needs and financial conditions more accurately (McNulty et al., 2001; Tan, 2016). Bigger sized banks may encounter challenges in effectively monitoring diverse profit-loss arrangements, managing issues stemming from information asymmetry, and adapting their credit risk monitoring systems, which make them less efficient (Doumpos et al., 2017). Therefore, larger banks do not necessarily equate to better efficiency (De Young, 1995; Isik & Hassan, 2003; Staub et al., 2010).

2.4.2.1.2 Credit Risk

Credit risk is measured by loss provisions over gross loan, and this ratio is also the proxy of the quality of the loan. Credit risk is often linked to bad loans, problem loans, or provisions for loan losses (Pastor, 2002). Berger and Humphrey (1997) put forward the bad luck hypothesis and bad management hypothesis to explain the relationship between credit risk and the efficiency of banks. Regarding the former, external occurrences like regional downturns resulting from 'bad luck' events can lead to the accumulation of bad loans. These bad loans, in turn, impact the efficiency of banks by necessitating additional efforts and resources to manage them, thereby incurring extra monitoring costs. In terms of the latter, poor management can be categorised as an internal issue, resulting in banks struggling to effectively handle costs and risks. Inadequate management practices contribute to inefficiency, consequently leading to lower overall efficiency levels. An increase in credit risk may force banks to increase their monitoring and provisioning expenditures, which would boost their operating expenses and result in further efficiency decreases (Zaman & Bhandari, 2022).

Credit risk is an important factor for banks' efficiency. A wealth of studies have concluded that there is a negative relationship between credit risk and banks' efficiency (Berger & DeYoung, 1997; Fukuyama & Matousek, 2017; Kamarudin et al., 2016; Ozili, 2017; Phung et al., 2022; Sufian & Habibullah, 2009; Takahashi & Vasconcelos, 2024; W Jubilee et al., 2022; Zaman & Bhandari, 2022). However, a limited number of studies have also argued for a positive relationship (Berger & DeYoung, 1997; Kamarudin et al., 2022).

2.4.2.1.3 Capitalisation

Equity over total assets is a proxy for capitalisation. If the proportion of equity in the capital structure of a bank is high, then it is more unlikely for the bank to go bankrupt as less money will be lent from outside. This view is supported by the moral hazard hypothesis, where the higher the proportion of equity, the more energy shareholders will devote to supervise the improper behaviours of managers. Bolarinwa and Soetan (2019) suggest that banks with large capitalisation are more resilient to fluctuations in risk and profit. In a similar vein, banks with enough capital have cheaper costs of funding due to fewer bankruptcy expenses. Otero et al. (2020) who examined cost efficiency during the 2005 to 2012 period found that the level of capitalisation imposes a positive effect on the cost efficiency of banks in the Middle East and North Africa (MENA) countries.

However, a negative relationship may also exist in the link between capitalisation and banks' efficiency. If the proportion of liability in the capital structure of a bank is high, they are more likely to suffer from financial distress and managers will suffer from loss of salary as well as bad reputation, which leads to a decrease in agency problems and higher efficiency. Additionally, overemphasising the ratio may cause inefficiency. A project with valuable return but minimal risk may be rejected by a bank with high equity because they are less willing to take on risk (Khan et al., 2020). High capitalisation will also result in wasteful spending and decreased efficiency (Do Van Anh, 2022). According to the Miller Modigliani theory, proper debt financing will contribute to the entire performance of a company (Brusov et al., 2018). Hence, an

optimal capital structure should be based on bankruptcy costs as well as taxes. A similar negative conclusion was also drawn for banks in Ghana (Adjei-Frimpong et al., 2014), Malaysia (Sufian, 2009), Latin America (Tabak et al., 2011), and Brazil (Takahashi & Vasconcelos, 2024).

2.4.2.2 Country-Level Control Variables

2.4.2.2.1 GDP Growth (GDPG)

GDPG is used to measure economic growth, where the positive nexus between GDPG and bank efficiency can be explained by the Theory of Financial Intermediation. Based on the theory, banks act as an intermediary in the economy by transferring money from surplus units (i.e., “lender-savers”) to deficit units as they promote economic activity. When GDP shows a positive trend, it often means that its economy is thriving and has seen an uptick in production, spending, and investment. Then, more opportunities for investment will be created and people who seek loans are less likely to default. Therefore, the quantity and quality of banks’ assets will improve, which further contributes to their efficiency. However, some studies hold a positive view on the GDPG-efficiency nexus (Barth et al., 2013b; Chen & Lu, 2021; Kamarudin et al., 2022), while others suggest a negative correlation between GDPG and banks’ efficiency (El Moussawi & Mansour, 2022; Kamarudin et al., 2016; Rashid & Jabeen, 2016).

2.4.2.2.2 Consumer Price Index (CPI)

Perry (1992) explains the two-side effect of CPI on banks' performance, where if banks predict inflation level correctly, then managers can adjust the interest accordingly and banks will earn profit. In contrast, incorrect predictions of the inflation level will harm the profits of banks. Barth et al. (2013) found that decreases in inflation are connected on average with increases in bank efficiency, which indicates that banks operating in a low inflation circumstance tend to gain high efficiency. Kamarudin et al. (2022) conducted a study on bank productivity during the period of 2006 to 2016 across Malaysia, Indonesia, Brunei, and Singapore. Their study revealed that CPI is negatively connected with banks' efficiency. This negative relationship can be attributed to unanticipated inflation and the lack of timely adjustment in operational costs, both of which contribute to a decrease in banks' profits. Kamarudin et al. (2017) explored the possible bank-level and country-level factors that may influence the productivity of banks in selected SEA countries and concluded similar negative results. Because adverse selection in the loan market is even worse during an inflation period, banks tend to issue fewer loans and charge higher risk premiums, which will drive away low-risk customer and investment. Thus, banks' profits will decline.

Tan et al. (2017) point out that banks will suffer loss because actual inflation could align with or fall below expectations. Besides that, macroeconomic and financial instability resulting from high CPI would decrease bank efficiency (Le et al., 2022). A similar conclusion was drawn in India (Maji & Saha, 2023). On the other hand, a positive relationship can be found in the studies of Sufian

and Kamarudin (2012) and W Jubilee et al. (2022). Therefore, banks can mitigate the adverse effects of CPI by accurately anticipating it and appropriately adjusting the interest rates.

2.4.2.2.3 COVID-19

Gulati et al. (2023) point out that through the implementation of a series of policy interventions and a cycle of monetary tightening by regulators, banks continue to operate normally. However, some scholars argue that the efficiency of the banking system is more or less impacted by market volatility, increased default risks, and liquidity limitations during times of economic, financial, or political crises (Arafat et al., 2021; Shabir, Jiang, Wang, et al., 2023; Yudaruddin, 2023). The COVID-19 pandemic is an extraordinary health disaster that has caused millions of people to suffer physically and lose their lives. It has also caused enormous global economic destruction, similar to what was observed during the GFC of 2007–2009. However, there is no consensus on the empirical evidence regarding whether COVID-19 has a positive or negative impact on banking efficiency.

Arafat et al. (2021) examined the impact of the pandemic on the performance and stability of CBs and IBs in the GCC region, Malaysia, and Pakistan. The regression results indicate that the pandemic is negatively correlated with profitability proxied by the ROE and ROA of both types of banks.

Yudaruddin (2023) examined the impact of COVID-19 on bank performance in Indonesia. The author collected the monthly financial data of 108 banks from

the Indonesian Financial Services Authority and chose ROA as the proxy of performance. The results revealed a negative impact of the pandemic on ROA.

Fu and Mishra (2022) documented that the pandemic significantly increased the number of people downloading bank-provided financial applications. The pandemic was found to facilitate the development of online transactions, ultimately enhancing the profitability of banks.

Following the method of Mehmood and De Luca (2023), the current study considered COVID-19 as a dummy variable, which equalled “1” if the years belonged to the COVID-19 pandemic (2020 to 2021).

2.4.3 The Country Governance-Bank Efficiency Nexus

A country's economy depends critically on its CG. An environment that fosters investor confidence, regulatory compliance, efficient risk management, contract enforcement, less corruption, and legal protections is produced by a country with a high CG index. All these elements work together to make banking operations more stable and efficient overall.

2.4.3.1 The Control of Corruption-Bank Efficiency Nexus

Kamarudin et al. (2018) analysed the impact of COC on bank price efficiency in the Gulf Cooperation Council (GCC) region. The sample data covered 74 banks from 2007 to 2016. They generated the price efficiency score by incorporating input and output price while the regression model was performed by panel regression analysis. The outcomes reveal that COC is positively

correlated with bank efficiency because the authorities can reduce corruption, which may improve the revenue efficiency of both IBs and CBs.

Gee and Abd Karim (2016) analysed the impact of COC on bank efficiency in East Asian countries from 2001 to 2008 using a sample of 261 CBs. They calculated bank efficiency using the DEA method and the Tobit model. Based on the results, COC increases bank efficiency because the expenses of bribery decrease with the increased level of COC. Additionally, corruption may result in ineffective loan offerings and have a detrimental impact on the level of market competition.

Kamarudin et al. (2016) analysed the impact of COC on revenue efficiency in the GCC region. The sample data covered 74 banks from 2007 to 2011. They found that COC is positively correlated with bank efficiency and denotes the lower private interest that public power can obtain. Because of the decrease in bank lending corruption, a strong regulatory environment that actively monitors and disciplines banks can improve the banking industry's efficiency (T. Beck et al., 2006).

Abuzayed et al. (2024) examined the impact of COC on banks' performance based on data from 160 countries for a period of 17 years, where ROA and Z-score were considered as the proxy of bank performance. Corruption was documented to decrease bank performance, and IBs were found to be less influenced by CBs. They also found that banks that operate in a more

competitive environment are less negatively impacted by corruption. Hence, the results confirm the “Sand in the Wheels” hypothesis.

Hoang et al. (2022) examined the impact of COC on private and state-owned firm performance in Vietnam. The difference-in-differences technique reveal that while COC improves the performance of private companies, it lowers state-owned companies' performance. State-owned companies frequently gain from corruption at the expense of private companies, which compels private companies to grudgingly participate in bribery. As a result, COC has a negative correlation with state-owned businesses and a positive correlation with private businesses.

Orudzheva et al. (2024) investigated the impact of COC on corporate social performance based on data of 102 of the world's largest firms. By enhancing resource management and eliminating efforts wasted by bribery or excessive commissions paid to overseas agents, COC was found to improve internal corporate efficiency. Therefore, implementing COC enables businesses to better manage resources, minimise waste, and promote sustainability.

Alam et al. (2020) examined the role of COC in firm performance proxied by ROA using a sample of 423 firms across 12 emerging countries. The results indicate that COC improves firm performance by lowering investment costs and encouraging FDI linked to innovation, thereby boosting research and development (R&D) investments. Additionally, COC enhances ethical

standards, expedites the efficiency of officials, and ultimately enhances business performance.

Kong et al. (2020) examined the impact of COC on firm productivity based on evidence of non-financial firms in China. Their quasi-natural experiment results indicate that COC help firms increase their productivity. COC activities significantly reduce officials' rent-seeking behaviours and restore the efficiency of governmental institutions, ultimately benefiting overall company productivity. Moreover, it is argued that these effects are achieved through mechanisms such as encouraging innovation and improving investment efficiency.

Le et al. (2021) examined the impact of COC on firm's productivity in Vietnam using a sample of 55,239 firms ranging from 2011 to 2017. The outcomes indicate a 1% increase in COC that is connected with a 9.1% decrease in productivity, demonstrating that COC fails to enhance productivity in transitional economies. In such economies, bribery often serves as a reliable means to secure scarce government resources in dysfunctional market environments, allowing firms to navigate past government shortcomings (e.g., rigid legal environment and weak bureaucracy).

Haschka et al. (2023) analysed the impact of COC on firm efficiency in Vietnam using sample data covering 40,000 firms from 2006 to 2013. SFA was used to calculate efficiency. The regression results indicate that COC increases firm efficiency primarily in two ways. First of all, it lessens needless

delays, expenses, and regulatory burdens. Secondly, it alleviates inefficiencies arising from financial development.

Alshubiri et al. (2023) examined the impact of COC on banking stability in 21 countries. The sample covered banks in three country groups from 2003 to 2019. COC was found to be negatively correlated with bank stability in high-income countries, which can be explained by the Grease the Wheels hypothesis, as corruption enables investors to circumvent legal restrictions to more easily accomplish their personal objectives. Put differently, corruption serves as a solution to the issue of inadequate institutional quality. In situations where the government is incapable of rectifying the institutional infrastructure, corruption can be viewed as a typical means of addressing this problem to promote growth and improve stability. However, the sign is the opposite in low-income countries. This can be explained by the Sand the Wheels hypothesis, where economic results are hampered by corruption and inefficient long-term foreign and local investment. Therefore, COC can contribute to economic growth and increase stability.

While studies specifically focusing on the COC are limited, there is a substantial body of literature examining the broader impacts of corruption on banking. These two lines of inquiry are intertwined because knowledge of the consequences of corruption offers important background information for assessing the possible advantages and workings of COC initiatives.

Barra et al. (2024) examined the impact of public corruption on bank lending in US using corruption-related convictions as the proxy of corruption. The final sample consisted of 14,762 banks with data from 1985 to 2013. Based on their study, corruption diminishes lending by intensifying information asymmetry and obstructing the approval of bank loans. Therefore, in highly developed economies like the US, limited access to bank loans may be a way for official corruption to impede local economic progress.

Liu et al. (2020) investigated the impact of corruption on firm's access on bank loans in China. They utilised World Bank survey data and conclude that there is an inverted U-shaped nexus between the two variables. This means that corrupt practices enable businesses to get bank loans and lower borrowing costs by removing ideological prejudice and overcoming market flaws. Besides that, corruption fosters credit allocation efficiency. However, higher corruption raises operating costs for businesses, skewing the distribution of bank lending resources and intensifying information asymmetry.

Bolarinwa and Soetan (2019) examined the impact of corruption on bank profitability in different corrupt environments. The final dataset included 111 banks from highly corrupt countries and 56 banks from low corruption and developed countries, covering the period from 2011 to 2017. Based on their results, only positive impacts have been confirmed in developed countries, while emerging countries have mixed results.

Akbar et al. (2024) investigated the impact of corruption on profitability in nine dual-banking countries with a sample consisting of 136 banks covering the period from 2015 to 2021. The study found that an increase in corruption leads to decreased profitability, demonstrating that corruption is one of the key factors influencing bank performance. Therefore, corruption causes lending rates to decline, ultimately reducing bank profitability.

Yakubu (2019) examined the impact of corruption on bank profitability in Ghana. The sample data covered 11 commercial banks from 2008 to 2017. They adopted ROA, ROE and Net Interest Margin as the indicators of profit. Corruption was found to be an important factor influencing bank profitability. The results indicate that corruption and bank earnings are inversely related, as banks fail to capitalise on the high levels of corruption within the country.

Bougatef (2017) analysed the impact of corruption on banks in Tunisia. The sample data covered 10 commercial banks from 2003 to 2014. The regression result indicated that corruption is positively correlated with bank profitability proxied by ROAA. Therefore, in Tunisia, a lack of intense competition among banks could result in corruption in lending, which means that banks take advantage of corruption.

Goel and Hasan (2011) analysed the impact of corruption on bad loans. Their regression results indicate that a higher rate of problematic loans is linked to corruption. This may be because some debtors are more likely to default in an

overall corrupt economy because they believe that they will eventually be apprehended and punished.

Asteriou et al. (2021) analysed the impact of corruption, economic freedom, regulation, and transparency on bank profitability in 19 Eurozone economies. The sample data covered 448 institutions from 2000 to 2018. Their regression results indicate that corruption decreases bank profitability. While corruption is generally modest, when it rises, loan rates decline, which reduces bank profitability. A similar conclusion was drawn by Pagano (2008), who investigated the impact of corruption and government control on banking lending in 18 Western hemisphere countries. The study found that the combination of substantial government involvement and corruption increase bank lending rate.

Lalountas et al. (2011) concluded that corruption can have a favourable impact on bank lending in the short run. However, corruption is not always beneficial. When bank lending increases are followed by a rise in non-performing loans, risk is elevated. Therefore, the consequences of bad loans ultimately result in losses for both banks and clients.

Hanousek et al. (2019) analysed the impact of corruption on firm efficiency in Central and Eastern European countries. Corruption was found to reduce efficiency because corruption is an extra expense that skews the best use of available resources. Competition creates incentives for businesses to produce

more effectively and improve their management techniques. However, corruption weakens competitive pressures and therefore reduces efficiency.

Ashyrov and Poltimäe (2022) examined the impact of corruption on firm energy efficiency. Their regression results indicate that corruption reduces efficiency because bribery increases the cost of energy efficiency and reduces the sustainability of firms.

Thus, to sum up, most existing studies conclude that COC is positively associated with institutions' efficiency (Haschka et al., 2023; Orudzheva et al., 2024), productivity (Kong et al., 2020), performance (Alam et al., 2020), and price efficiency (Kamarudin et al., 2018), while others find it to be negatively associated with institutions' productivity (Le et al., 2021) and stability (Alshubiri et al., 2023). Besides that, corruption may reduce institutions' efficiency and profitability (Akbar et al., 2024; Asteriou et al., 2021; Hanousek et al., 2019). However, some scholars, such as Bougatef (2017), argue that corruption can increase bank profitability. Overall, few existing studies have examined how COC affects bank efficiency in the three main Islamic hubs. Table 2.1 provides a summary of the COC-bank efficiency nexus.

Table 2.1 : Literature Matrix for COC-Bank Efficiency Nexus

Author	Country/Period	Variables	Results
Kamarudin et al. (2018)	GCC region/2007 - 2016	COC, bank price efficiency	COC is positively correlated with bank efficiency
Gee and Abd Karim (2016)	East Asian countries/ 2001-2008	COC, bank efficiency	COC increases bank efficiency
Kamarudin et al. (2016)	GCC region/2007 - 2011	COC, revenue efficiency	COC increases bank efficiency

Table 2.1 : Continued

Author	Country/Period	Variables	Results
Abuzayed et al. (2024)	160 countries/ 2000-2016	COC, banks' performance	Corruption decreases bank performance
Hoang et al. (2022)	Vietnam/ 2006-2019	COC, firm performance	COC improves private companies' and lowers state-owned companies' performance.
Orudzheva et al. (2024)	102 of the world's largest firms/ 2011 and 2013	COC, corporate social performance	COC improves internal corporate efficiency
Alam et al. (2020)	12 emerging countries/2006-2013	COC, firm performance	COC improves firm performance
Kong et al. (2020)	non-financial firms in China/2011-2017	COC, firm productivity	COC improves firm productivity
Le et al. (2021)	firms in Vietnam/ 2011-2017	COC, firm's productivity	COC decreases firm productivity
Haschka et al. (2023)	firms in Vietnam/ 2006-2013	COC, firm efficiency	COC increases firm efficiency
Alshubiri et al. (2023)	three country groups/ 2003-2019	COC, bank stability	COC reduces bank stability
Barra et al. (2024)	US/1985-2013	Corruption, bank lending	Corruption reduces bank lending
Liu et al. (2020)	China/ 2010	Corruption, firm's access on bank loan in China.	There is an inverted U-shaped nexus between corruption and firm's access on bank loan in China.
Bolarinwa and Soetan (2019)	highly corrupt countries and least corrupt and developed countries/ 2011-2017	Corruption, bank profitability	Positive impacts have been confirmed in developed countries, but emerging countries have mixed results
Akbar et al. (2024)	nine dual-banking countries/2015-2021	Corruption, bank profitability	Corruption decreases profitability
Yakubu (2019)	Ghana/2008-2017	Corruption, bank profitability	Corruption decreases profitability
Bougatef (2017)	Tunisia/2003-2014	Corruption, bank profitability	Corruption increases bank profitability
Goel and Hasan (2011)	More than 100 countries/2007	Corruption, bad loans	Corruption increases problematic loans.
Asteriou et al. (2021)	19 Eurozone economies/2000 - 2018	Corruption, on bank profitability	Corruption decreases bank profitability

Table 2.1 : Continued

Author	Country/Period	Variables	Results
Lalountas et al. (2011)	127 countries/ 2006	Corruption, bank lending	Corruption increases bank lending in the short run
Hanousek et al. (2019)	Central and Eastern European countries/ 2000-2013	Corruption, firm efficiency	Corruption reduces efficiency
Ashyrov and Poltimäe (2022)	Vietnam/ 2015	Corruption, firm energy efficiency	Corruption reduces efficiency

2.4.3.2 The Voice and Accountability-Bank Efficiency Nexus

Kamarudin et al. (2018) analysed the impact of VA on bank price efficiency in the GCC region. The sample data covered 74 banks from 2007 to 2016. Their regression results indicate that VA increases efficiency because it encourages democracy and ends poverty through the participation of individuals and officers, which may subsequently result in increased efficiency.

Alam et al. (2020) analysed the impact of VA on firm performance in 12 emerging countries. They conclude that VA is positively correlated with firm performance. VA guarantees that managers behave responsibly, which affects all kinds of investment. Besides, high VA also guarantees responsible choices, deeds, and dedication to completing an assignment. High responsibility also ensures innovation and learning inside a company.

Kamarudin et al. (2016) analysed the impact of VA on revenue efficiency in the GCC region ranging from 2007 to 2011. They found that VA is essential for higher efficiency among banks. Through the active engagement of individuals and governmental institutions, VA strives to combat poverty and

foster democracy, which can potentially enhance the revenue efficiency of banks.

A higher level of VA index is also more closely connected with transparency. Le et al. (2021) investigated the role of transparency in firm productivity based on evidence from Vietnam. They found that greater openness facilitates access to information for private businesses, particularly regarding resource allocation and policy implementation, enabling them to enjoy a more level playing field. Moreover, transparency fosters predictability in the operating environment, allowing firms to perform more efficiently.

Tadesse (2006) examined the impact of disclosure on bank stability. He concludes that disclosure increases market efficiency through the process of price discovery, which makes banks more stable. Improved knowledge about the dangers in the banking industry, sourced from increased transparency, could also assist in revealing hidden expenses.

Mehrez and Kaufmann (2000) contend that banks are more likely to counter problems due to lack of transparency. Banks are unable to discern between enterprises' quality and shocks. Under these conditions, banks could offer more credit than during the normal period and overestimate returns. Consequently, losses will increase but not be reported because banks will roll over loans, which will make whole loss greater. All in all, banks tend to extend credit beyond what is optimal in a nation where government policy is opaque,

which suggests a decline in profitability and an increased danger of financial crisis.

Akhigbe et al. (2013) analysed the impact of transparency on profit efficiency. The regression results suggest that companies with higher levels of transparency tend to be better managed, as transparency is linked to more dependable information exchange between a company's internal operations and its investors.

Kolstad and Wiig (2009) conclude that when there is a lack of transparency, corruption is perceived as less dangerous. Less transparency encourages some financial sector workers to abuse their power at the expense of other people's interest.

However, a negative impact of transparency has also been documented. For instance, Cordella and Yeyati (1998) conclude that transparency could have unfavourable effects on financial institutions that are already facing difficulties because disclosing information could exacerbate the company's situation during these challenging times. Furthermore, a lack of financial knowledge could lead to misinterpretation when trying to understand the information disclosed by financial institutions, thereby affecting institutions' productivity.

Consequently, VA may be a significant factor affecting the efficiency of institutions. Previous scholars have argued that VA is beneficial for productivity, revenue efficiency, price efficiency, and performance (Alam et al., 2020; Kamarudin et al., 2016, 2018; Le et al., 2021), or is detrimental for

productivity (Cordella & Yeyati, 1998). However, most of the research in the literature ignores how VA affects bank efficiency in the three primary Islamic hubs. Table 2.2 summarises the literature on the VA-bank efficiency nexus.

Table 2.2 : Literature Matrix for VA-Bank Efficiency Nexus

Author	Country/Period	Variables	Results
Kamarudin et al. (2018)	GCC region/2007-2016	VA, bank price efficiency	VA increases bank price efficiency.
Alam et al. (2020)	12 emerging countries/2006-2013	VA, firm performance	VA is positively correlated with firm performance.
Kamarudin et al. (2016)	GCC region/2007-2011	VA, revenue efficiency	VA increases bank efficiency.
Le et al. (2021)	Vietnam/2011–2017	Transparency, firm productivity	Transparency increases firm productivity.
Tadesse (2006)	49 countries / 1990–1997	Disclosure, bank stability	Disclosure makes banks more stable.
Mehrez and Kaufmann (2000)	56 countries / 1977- 1997	Transparency, probability of a banking crisis	Banks are more likely to counter problems due to lack of transparency
Akhigbe et al. (2013)	3603 publicly traded bank holding companies/ 1996 - 2006	Transparency, profit efficiency	Transparency increases profit efficiency
Kolstad and Wiig (2009)	Resource-rich developing countries	Transparency, corruption	Transparency reduces corruption
Cordella and Yeyati (1998)	Economic Model	Transparency, the probability of bank failures.	Transparency reduces the probability of bank failures.

2.4.4 The Impact of Globalisation on Banks

2.4.4.1 The Impact of Trade Globalisation on Banks

Yao et al. (2021) investigated the impact of trade on energy efficiency. The sample data covered 36 countries from 2000 to 2014. Trade was found to help

firms expand their product to foreign countries and gain economies of scale that improve environmental efficiency. Besides, firms obtain green technology and knowledge from outside, which enhance energy efficiency.

Akdoğan (2018) analysed the impact of globalisation on firms' efficiency in Turkey. The sample data covered 142 firms from 2001 to 2010. The regression results reveal that globalisation considerably reduces the sales of large corporations and increases the sales of smaller ones. This may be explained by the fact that competition is exacerbated by globalisation, which reduces the efficiency of big businesses. In addition, small businesses are able to enter overseas markets and grow more efficiently as they are not under as much pressure from bigger corporations.

Nguyen and Nguyen (2018) analysed the impact of globalisation on bank performance in Vietnam. The sample data covered 14 banks from 2007 to 2014. The regression results indicate that economic globalisation enhances the efficiency of banks, while higher restrictions protect banking institutions from developing countries from external shocks.

Liu et al. (2023) analysed the impact of economic globalisation on energy efficiency. The sample data covered 141 countries from 1980 to 2016. The regression results reveal that economic globalisation could increase energy efficiency. Economic globalisation, accompanied by the introduction of financial and trade, tends to stimulate technical innovation and foster more substantial economic growth. When foreign investors invest in a new country,

they often bring with them advanced and inventive techniques that use less energy than the host. Through knowledge sharing about optimal green practices, globalisation could improve energy efficiency by bringing attention to these environmental practices.

Zhang and Daly (2014) analysed the impact of economic globalisation on banks in China. The sample covered 124 banks from 2004 to 2010. The regression results indicate that economic globalisation is positively correlated with bank performance proxied by ROA. China's banking industry has been expanding due to increased trade activities. This liberalisation has made the entire banking sector more competitive, and Chinese banks have performed well in this highly competitive market. Besides that, social globalisation reduces barriers and promotes a reduction in transaction costs.

Sufian (2016) examined the impact of globalisation on bank efficiency in Malaysia. The sample data covered 34 commercial banks from 1999 to 2008. The regression results indicate that globalisation increases bank efficiency. Low finance restrictions increase bank efficiency as the liberalisation of financial services introduce competition, breaking monopolistic profits.

Sufian and Kamarudin (2016) analysed the impact of globalisation on bank performance in South Africa between 1998 and 2012. The results indicate that trade globalisation increases performance proxied by ROA. For developing nations like South Africa, trade integration can be more advantageous than detrimental. Banks in these nations can benefit from higher trade flows. Thus,

trade globalisation was found to have a significant impact on institutions' outcomes.

Most scholars indicate a positive correlation between trade globalisation and institutions' performance or efficiency (Liu et al., 2023; Sufian, 2016; Sufian & Kamarudin, 2016), whereas others (Akdoğan, 2018) produce contradictory findings. This implies that the more a country engages in international trade, the more the outcomes that micro-level entities within the country will yield. Nevertheless, few studies have investigated the impact of trade globalisation on bank efficiency in three main Islamic hubs. Table 2.3 summarizes the literature on the trade globalisation-banks' efficiency nexus.

Table 2.3 : Literature Matrix for Trade Globalisation-Banks' Efficiency Nexus

Author	Country/Period	Variables	Results
Yao et al. (2021)	36 countries/ 2000-2014	Trade, energy efficiency	Trade increases energy efficiency
Akdoğan (2018)	Turkey/2001- 2010	Globalisation, firms' efficiency	Globalisation increases firms' efficiency
Nguyen and Nguyen (2018)	Vietnam/2007- 2014	Globalisation, on bank performance	Globalisation increases bank performance
Liu et al. (2023)	141 countries /1980-2016	Economic globalisation, energy efficiency	Economic globalisation could increase energy efficiency
Zhang and Daly (2014)	China/2004- 2010	economic globalisation, bank performance	Economic globalisation increases bank performance
Sufian (2016)	Malaysia/1999- 2008	Finance restrictions, bank efficiency	Low finance restrictions increase bank efficiency
Sufian and Kamarudin (2016)	South Africa/ 1998-2012	Globalisation, bank performance	Trade globalisation increases bank performance

2.4.4.2 The Impact of Financial Globalisation on Banks

Yakubu and Bunyaminu (2022) investigated the impact of financial globalisation on bank profitability measured by ROA and ROE in Sub-Saharan Africa using a sample data of 40 banks from 2008 to 2016. The results indicate that financial globalisation is negatively correlated with bank profitability, implying that it does not motivate profitability. While financial globalisation fosters the liberalisation of the financial sector and drives higher demand, these reforms lead to increased competition in the banking industry due to the growing number of banks operating in the market.

Denizer et al. (2007) analysed the impact of financial liberalisation on bank efficiency in Turkey. The sample data covered the period of 1970 to 1994, and they used the DEA method to generate bank efficiency. The results reveal that financial liberalisation has no effect on bank efficiency.

Hermes and Nhung (2010) examined the impact of financial liberalisation on bank efficiency in Latin America and Asia. The sample covered more than 4,000 observations from 10 emerging economies from 1991 to 2000 and they used the DEA method to calculate bank efficiency. The results indicate that financial liberalisation increases bank efficiency proxied by SE, PTE, and overall TE.

Sufian and Kamarudin (2016) examined the impact of financial globalisation on bank performance proxied by ROA in South Africa. In their study, financial globalisation is found to be positively correlated with bank performance.

Usually, financial sector liberalisation comes after capital account liberalisation. Monopolistic profits typically decline with increased competition brought by financial liberalisation, reducing the exclusive advantages enjoyed by certain banking operations.

Gaies and Jahmane (2022) analysed the impact of financial globalisation on banks across 16 EU member countries. The sample covered 52 European banks from 2001 to 2018. The regression results indicate that financial globalisation promotes not only bank profitability proxied by ROA but also bank stability denoted by Z-score. Deeper integration into the global market increases banks' savings, financial resources, and customer base, thereby enhancing banks' profitability.

Karkowska and Pruszyńska (2018) analysed the impact of financial liberalisation on bank efficiency in 28 European countries. The sample data were from 1995 to 2015. Based on their findings, prior to the GFC, financial liberalisation increases bank efficiency. Therefore, effect of financial liberalisation on bank efficiency is not significant after the financial crisis. Through internal monitoring and management, the banking industry successfully controlled expenses, which is more conducive to increasing efficiency. Thus, financing liberalisation and globalisation are not the main drivers of increased bank efficiency.

Sufian and Habibullah (2012) examined the impact of globalisation on bank efficiency in Indonesia. The sample data covered the period of 1999 to 2007

and they generated efficiency using DEA. The regression results indicate that restrictions on globalisation reduce bank efficiency. Financial liberalisation facilitates the entry of external capital into the market, disrupts monopolistic profits, and intensifies competition. Banks are forced to innovate by increasing competition, and financial depth improves resource allocation and technology. Finally, the infusion of foreign banks enhances efficiency by bringing with it sophisticated operational principles and management expertise.

Sufian and Habibullah (2011) analysed the impact of globalisation on bank efficiency in China. They found that economic globalisation increases bank efficiency, so this factor is very important. However, limitations on the flow of money should also be emphasised. The liberalisation of capital accounts is typically accompanied by the liberalisation of the financial services industry, which increases competition and erodes profits.

Based on previous evidence, the current study concludes that financial globalisation is positively associated with institutions' performance, profitability, and efficiency (Gaies & Jahmane, 2022; Karkowska & Pruszyńska, 2018; Sufian & Kamarudin, 2016). However, a study examining bank profitability in Sub-Saharan Africa by Yakubu and Bunyaminu (2022) finds a negative connection. Nevertheless, few scholars have paid attention to the impact of financial globalisation on bank efficiency in three main Islamic hubs.

Table 2.4 summarises the literature on the financial globalisation-banks' efficiency nexus.

Table 2.4 : Literature Matrix for Financial Globalisation-Banks' Efficiency Nexus

Author	Country/Period	Variables	Results
Yakubu and Bunyaminu (2022)	Sub-Saharan Africa/2008-2016	Financial globalisation, bank profitability	Financial globalisation reduces bank profitability
Denizer et al. (2007)	Turkey/1970-1994	Financial liberalisation, bank efficiency	Financial liberalisation has no effect on bank efficiency
Hermes and Nhung (2010)	Latin America and Asia/1991-2000	Financial liberalisation, bank efficiency	Financial liberalisation increases bank efficiency
Sufian and Kamarudin (2016)	South Africa/1998-2012	Financial globalisation, bank performance	Financial globalisation increases bank performance
Gaies and Jahmane (2022)	EU member countries/2001-2018	financial globalisation, bank profitability, bank stability	Financial globalisation increases bank profitability and bank stability
Karkowska and Pruszyńska (2018)	28 European countries/1995-2015	Financial liberalisation, bank efficiency	Prior to the GFC, financial liberalisation increases bank efficiency
Sufian Habibullah (2012)	Indonesia/1999-2007	Financial liberalisation, bank efficiency	Financial liberalisation, increases bank efficiency
Sufian Habibullah (2011)	China/2000–2007	Economic globalisation, bank efficiency	Economic globalisation increases bank efficiency

2.4.4.3 The Impact of Interpersonal Globalisation on Banks

W Jubilee et al. (2022) examined the impact of interpersonal globalisation on bank productivity in SEA using sample data covering 55 banks from 2008 to 2017. The regression results reveal that interpersonal globalisation increases IBs' productivity. The increasingly close exchange of international information significantly reduces transaction costs globally, facilitates international trade, and eliminates barriers that previously hinder banking operations. A similar positive relationship is documented in South Africa (Sufian & Kamarudin,

2016) for bank performance and in Indonesia for bank efficiency (Sufian & Habibullah, 2012).

Sufian and Habibullah (2014) investigated the impact of economic globalisation on Malaysian banks' productivity from 1998 to 2007. They measured productivity using the Malmquist Productivity Index and conclude that economic globalisation increases productivity. Additionally, there is a negative nexus between bank productivity and personal contacts, indicating that interpersonal globalisation plays a significant role in determining an entity's productivity.

In conclusion, interpersonal globalisation has been found to positively impact institutions' performance, efficiency, and productivity (Sufian & Habibullah, 2012; Sufian & Kamarudin, 2016; W Jubilee et al., 2022), yet has opposing effect on bank productivity (Sufian & Habibullah, 2014). However, few scholars have studied the impact of interpersonal globalisation on bank efficiency in the three main Islamic hubs.

Table 2.5 summarises the literature on the interpersonal globalisation-banks' efficiency nexus.

Table 2.5 : Literature Matrix for Interpersonal Globalisation-Banks' Efficiency Nexus

Author	Country/Period	Variables	Results
W Jubilee et al. (2022)	SEA/2008- 2017	Interpersonal globalisation, bank productivity	Interpersonal globalisation increases bank productivity

Table 2.5 : Continued

Author	Country/Period	Variables	Results
Sufian and Kamarudin (2016)	South Africa/1998-2012	Interpersonal globalisation, bank performance	Interpersonal globalisation increases bank performance
Sufian and Habibullah (2012)	Indonesia/1999-2007	Interpersonal globalisation, bank efficiency	Interpersonal globalisation increases bank efficiency
Sufian and Habibullah (2014)	Malaysia/1998-2007	Personal contacts, banks' productivity	Personal contacts reduces banks' productivity

2.4.4.4 The Impact of Informational Globalisation on Banks

W Jubilee et al. (2022) examined the impact of informational globalisation on bank productivity based on bank data in SEA. Outcomes indicate that informational globalisation reduces productivity. This was because a large percentage of families lacked access to the Internet in the sample region. In actuality, a lot of consumers still see internet banking as unsafe, mostly as a result of inadequate knowledge. Besides, the lack of Internet and telecommunications specialists in developing nations contribute to the underdevelopment of technologies.

Sufian et al. (2017) analysed the impact of information globalisation on bank efficiency in Malaysia. The sample data covered 22 banks from 1999 to 2012. The regression results indicate that information globalisation has a favourable influence on efficiency. However, the sign turns negative after controlling for all the three dimensions of social globalisation. While information globalisation may lessen information asymmetry and enhance efficiency, only banks with

headquarters nearby can enjoy this benefit because of things like shared languages, cultures, and shorter travel times.

Sufian and Kamarudin (2016) analysed the impact of information globalisation on bank performance in South Africa. The results indicate that information globalisation is negatively correlated with bank performance. This means that information globalisation decreases bank efficiency. The need for skilled labour may increase as a result of technology improvements in both developed and emerging nations. While technology benefits everyone, institutions with lower levels of ability tend to gain less from the expanding flow of information, resulting in reduced performance.

Hussain et al. (2021) examined the impact of information globalisation on the efficiency of microfinance institutions (MFIs). They found that information globalisation reflects the dissemination of information and ideas across the globe through various media channels, indicating that the operations of commercial organisations are accelerated due to the faster exchange of information in complex relationships. The rapid flow of information also positively impacts firms' creativity, as employees who receive timely information are better prepared to respond quickly and plan effectively for future tasks.

Banks have to manage vast amounts of consumer data, raising issues with data privacy and legal compliance (Luo et al., 2023) that may undermine banks' profit. Moreover, many people perceive online banking as unsafe due

to their limited understanding of the internet, which also limit the development of online banking. Consequently, as highlighted by the previous studies, this dimension of globalisation is a significant determinant of institutional outcomes. Previous scholars have argued that information globalisation can either enhance (Hussain et al., 2021) or hinder (Sufian & Kamarudin, 2016; W Jubilee et al., 2022) the productivity, efficiency, or performance of institutions. However, limited research has focused on the impact of information globalisation on bank efficiency within the three major Islamic hubs, leaving this area largely overlooked.

Table 2.6 summarises the literature on the informational globalisation-banks' efficiency nexus.

Table 2.6 : Literature Matrix for Informational Globalisation-Banks' Efficiency Nexus

Author	Country/Period	Variables	Results
W Jubilee et al. (2022)	SEA/2008- 2017	Informational globalisation, bank productivity	Informational globalisation reduces bank productivity
Sufian et al. (2017)	Malaysia/1999-2012	Information globalisation, bank efficiency	Information globalisation increases bank efficiency
Sufian and Kamarudin (2016)	South Africa/1998-2012	Informational globalisation, bank performance	Informational globalisation reduces bank performance
Hussain et al. (2021)	six Asian countries/ 2011–2018	Information globalisation, the efficiency of MFIs	Information globalisation increases efficiency of MFIs

2.4.4.5 The Impact of Cultural Globalisation on Banks

Hussain et al. (2021) analysed the effect of cultural globalisation on the efficiency of MFIs in six Asian countries. The sample covers 176 MFIs ranging

from 2011 until 2018. Cultural globalisation can have a positive impact on the efficiency of MFIs in certain countries. A higher level of cultural globalisation reflects the broader dissemination of cultural and social norms, which helps reduce cultural barriers and information asymmetry between lenders and borrowers. This, in turn, lowers the transaction costs associated with processing loans and reduces the management costs of assessing borrower quality and conducting subsequent monitoring.

Nguyen and Nguyen (2018) examined the influence of cultural globalisation on bank performance based on evidence from Vietnam. Outcomes reveal that cultural proximity is negatively correlated with banks' performance. Foreign customer interaction practices may also be at odds with local managers, which hinders the development plan and impedes banks' efficiency.

W Jubilee et al. (2022) conducted a study focusing on SEA banks. They conclude that cultural globalisation lowers bank productivity and that individual attitudes toward matters and decision-making processes can be shaped by culture. The expansion of Western multinational corporations has introduced not only technology and economic benefits, but also their cultural influence, gradually eroding the traditional systems of non-Western nations. Banks in SEA, for instance, have begun to emulate Western frameworks, leading to changes in their risk management systems. As a result, these banks have become less productive due to overly complex processes and excessive protocols.

Sufian et al. (2017) examined the impact of cultural globalisation on Malaysian banks' efficiency and found that increased social integration greatly boosts Malaysian banks' efficiency. This conclusion provides evidence in favour of the global advantage hypothesis (Berger et al., 2000), whereby according to this theory, institutions can only operate more effectively than domestic banks in other countries if they benefit from specific favourable market.

According to Dreher (2006), cultural globalisation measures the prevalence of U.S. cultural products. This index encompasses trade in cultural goods, international trademarks, and McDonald's restaurants. Dreher (2006) reports that the Western culture has rapidly spread across the globe, shaping various aspects of life (Nguyen & Nguyen, 2018). In addition, current research suggests that cultural globalisation is a significant factor influencing institutional performance. While Hussain et al. (2021) and Sufian et al. (2017) argue that this indicator enhances institutional efficiency, W Jubilee et al. (2022) contends that it hinders productivity. However, the impact of cultural globalisation on bank efficiency in the three main Islamic hubs has been largely underexplored, which is the gap this study aims to address.

Table 2.7 summarises the literature on the cultural globalisation-banks' efficiency nexus.

Table 2.7 : Literature Matrix for Cultural Globalisation-Banks' Efficiency Nexus

Author	Country/Period	Variables	Results
Hussain et al. (2021)	six Asian countries/ 2011–2018	Cultural globalisation, the efficiency of MFIs	Cultural globalisation increases efficiency of MFIs

Table 2.7 : Continued

Author	Country/Period	Variables	Results
Nguyen and Nguyen (2018)	Vietnam/2007-2014	Cultural globalisation, bank performance	Cultural globalisation reduces bank performance
W Jubilee et al. (2022)	SEA/2008- 2017	Cultural globalisation, bank productivity	Cultural globalisation lowers bank productivity
Sufian et al. (2017)	Malaysia/1999-2012	Cultural globalisation, bank efficiency	Cultural globalisation increases bank efficiency

2.4.5 Economic Policy Uncertainty on Bank Efficiency

2.4.5.1 Economic Policy Uncertainty

Frank Hyneman Knight was among the earliest to distinguish between "risk" and "uncertainty" (Stigler, 1985). The quantifiability of the likelihood that an event will occur defines risk. Since risk has a known probability distribution, it falls under the category of "measurable uncertainty". Conversely, uncertainty cannot be subjected to a quantitative analysis using theories or current knowledge.

A more specific subset of uncertainty is economic uncertainty. Pastor and Veronesi (2012) conclude that political uncertainty is best described as anxiety over what the government will do next. This uncertainty originates from the challenge that economic agents have in accurately determining whether decision-making bodies will change the policies that are currently in effect. Furthermore, the type and timing of any prospective modifications, should they materialise, are also unknown (Gulen & Ion, 2016).

Countries adopt a range of economic measures to save their economy following the financial crisis of 2008. The regular introduction of new policies has led to growing uncertainty in economic policies, which have gained prominence. As a result, the academic community has started implementing techniques to measure uncertainty surrounding economic policies.

Boutchkova et al. (2012) used political elections or changes in government to measure economic uncertainty. Jens (2017) claimed that if political uncertainty influences anticipated return, businesses will postpone investing until an election. However, the approach was criticised by Gulen and Ion (2016) who believe that changes in administration or political elections alone do not always result in EPU, nor do political elections always generate it. Secondly, the fact that elections are not continuous makes their usage problematic.

A widely used index is the EPU Index constructed by Baker et al. (2016). The calculations are based on the frequency of nouns related to this topic. Among the terms that are pertinent are "economy", "policy", and "uncertainty", where "policy" refers to both the actual policy and concepts that are associated to it, including government and measurements. Reports that contain all three terms are then included to the statistical scope, and additional statistical adjustments are made to generate the EPU Index.

Another widely used index is the WUI constructed by Ahir et al. (2022). This index is constructed by tallying the number of times the term "uncertainty" (or a synonym) appears in reports from the Economist Intelligence Unit (EIU) (Ahir

et al., 2022). The latter index has several advantages over the former. Firstly, the latter is more reliable as it relies on EIU reports, whereas the former is based on counting the frequency of newspaper coverage (Bilgin et al., 2021). Secondly, while the former covers 22 countries, the latter includes 143 countries, making it more widely applicable.

2.4.5.2 The Impact of Uncertainty on Efficiency

Wei et al. (2022) analysed the impact of EPU on energy efficiency based on the data of 39 cities in China over a seventeen-year period (2003 to 2019). They concluded that EPU can impact energy efficiency through the following channels: energy prices, investors' decisions, and individuals' activities. The basic regression results indicate that EPU reduces energy efficiency while quantile regression results reveal that developed cities with more advanced technological advancements are better equipped to manage the impact of EPU on energy efficiency.

Tarkom and Ujah (2023) examined the impact of EPU on firm efficiency in the US. They collected data from various sources and ultimately obtained a sample of 12,207 US firms. The regression results indicate that EPU reduces firm efficiency by decreasing investment.

Yu et al. (2024) investigated the impact of EPU on green efficiency in China based on data from 2005 to 2021. They conclude that from the 0.05 quantile to 0.75 quantile, EPU reduces green efficiency. The existence of EPU creates uncertainty about the direction and stability of the economy, which cause

businesses to put their own interests ahead of environmental concerns. EPU was also found to boost green efficiency when it surpasses a particular threshold. This suggests that businesses are more likely to engage in low-carbon initiatives due to the higher potential returns.

Frijns et al. (2023) examined the impact of uncertainty on informational efficiency in the US. The regression results indicate that uncertainty reduces informational efficiency and the robustness test confirms this result. Uncertainty was found to act as a barrier to effectively incorporate information into stock prices, leading to increased stock mispricing and reduced informational efficiency. This occurs as uncertainty decreases the precision of value-relevant signals.

Zhou et al. (2023) investigated the impact of uncertainty on corporate innovation in China. The data consists of Chinese A-share listed companies from 2011 to 2020 and they constructed a firm-level EPU index through text mining. The results reveal that EPU reduces efficiency. R&D activities typically entail high sunk costs and are long-term in nature, rendering them more susceptible to EPU. Therefore, managers favour short-term innovation programmes over long-term innovation in the face of increased EPU levels. However, short-term programmes have lower odds to generate favourable outputs, which decrease efficiency. Heterogeneity studies show that private and high-tech companies are more likely to be affected by the uncertainty.

Li et al. (2021) examined the impact of uncertainty on energy efficiency in China. The data consisted of prefecture-level cities from 2001 to 2014. The regression results indicate that a 1% decrease in uncertainty is associated with a 1.9% increase in efficiency. The decline in EPU encourages firms to invest more, embrace new technology to create goods of greater quality, and foster corporate innovation. Furthermore, lower foreign capital inflow is accompanied with a declining EPU level, encouraging the development of green technologies. Based on the heterogeneity results, the impact of economic uncertainty on efficiency is more pronounced in provincial capitals, highly marketed cities, and cities with a manufacturing focus.

Cheng (2019) analysed the impact of EPU on capital management efficiency. The sample data consisted of listed non-financial enterprises of Shanghai and Shenzhen stock markets in China from 2000 to 2010. The results indicate that EPU reduces efficiency. EPU raises doubts about companies' projected sales, which raises the share of credit sales and lowers the effectiveness of accounts receivables turnover.

Luo et al. (2020) analysed the impact of political uncertainty on labour investment efficiency based on the data of A-share listed firms in China from 2000 to 2015. The appointment of a new communist party secretary in a city was used to gauge political uncertainty. The regression results indicate that after a new appointment, efficiency is reduced. During periods of higher uncertainty, there is a greater tolerance for managers to manipulate business operations. Managers often hire more people and expand the company below

its optimal size, which grants them more leeway to engage in opportunistic behaviour. However, efficiency was found to decline as these new hires did not necessarily translate into improved company operations.

Doan et al. (2020) analysed the impact of EPU on firms' performance in 25 countries. The data covered the period of 2007 to 2016 and consisted of small and medium enterprises. EPU data from Ozturk and Sheng (2018) were used, and EPU was concluded to reduce firms' performance. Furthermore, economic uncertainty was found to have less influence on performance in developed nations. This is attributed to advanced management practices, open-to-export markets, and advanced technology.

Kong et al. (2022) collected data on Chinese A-share listed companies from 2007 to 2019. They concluded that macro EPU increases the risk of investment while preventing enterprises from increasing the scope and efficiency of their investments.

2.4.5.3 The Impact of Uncertainty on Banks

Danisman and Tarazi (2024) analysed the impact of EPU on commercial banks' stability in US based on quarterly data from 2011Q1 to 2020Q3. The regression results indicate that higher EPU decreases bank stability. Banks lend more to risky borrowers at high levels of uncertainty. Furthermore, shareholders anticipate that earnings will respond to heightened uncertainty with a temporal lag, requiring unchanged returns. Banks are compelled by this to look for high-return investments, which frequently entail significant risk

(Dell’Ariccia et al., 2014). Finally, the stability of banks is weakened by an increase in the amount and volatility of interest rates on loans and deposits. Highly capitalised and liquid banks are expected to be less affected by EPU, whereas larger banks, on the contrary, are more susceptible.

Bilgin et al. (2021) analysed the impact of EPU on IBs and CBs’ stability. The sample consisted of 568 banks in 20 countries from 2009 to 2018. The regression results reveal that EPU reduces the stability of CBs and not for IBs. Additionally, heterogeneity tests indicate that the impact of EPU on CBs’ efficiency is more pronounced in Muslim-majority countries, common-law countries, GCC countries, and richer countries.

Ozili and Arun (2023) examined the impact of EPU on bank profitability in 22 advanced countries. The sample period was from 1998 to 2017 primarily due to data availability and to mitigate the impact of COVID-19. The regression results indicate that EPU reduces bank profitability. Customers of banks may be reluctant to use banks due to financial troubles and the subliminal idea that banks would raise service fees when EPU increases. Banks may lose noninterest income as a result of this. Besides, the characteristics of a country could mitigate the negative effects of EPU on bank profitability. EPU was found to increase the profit of banks in Asia and America because they want to please their shareholders and optimise CEO compensation.

Shabir et al. (2023) analysed the impact of EPU on banks’ risk in 19 countries. The sample data covered 574 banks from 2009 to 2020. The regression

results indicate that EPU increases banks' risk and reduces stability. Banks may engage in herding behaviours while confronting EPU as a result of inadequate risk detection capabilities. In addition, banks may finance high-risk projects to gain higher returns due to the low rates and fierce interbank competition in this the environment. In the end, however, this behaviour would result in less stability and more risk.

Nguyen (2021) analysed the impact of EPU on bank stability in eight major European countries. The sample data covered 950 commercial banks from 2005 to 2020. The regression results indicate that EPU reduces bank stability. On one hand, herding behaviour in the banking industry may worsen information asymmetry between lenders and borrowers during high EPU periods, increasing bank uniformity in loan and investing tactics. On the other, banks' profitability lowers as a result of the "prudence effect" and "delay effect" of EPU on interest spreads and overall loan demand. This causes banks to shift to higher-risk assets to increase returns, which raises yields.

Shabir et al. (2022) investigated the impact of EPU on bank lending in 19 countries from 2006 to 2018. The regression results indicate that EPU reduces bank lending. On the one hand, high EPU depresses economic activity, lowers investment levels, raises inflation expectation, and lowers household income consumption. This might have a direct influence on the credit demand of families and enterprises by sharply slowing the expansion of bank credit. Besides that, banks' non-performing loans and loan-loss provisions increase. On the other hand, high EPU affects the accuracy of banks' assessment of

borrowers' qualifications and repayment abilities, leading to cautious lending by banks. Finally, better institutional quality alleviates the negative impact while tight bank regulation strengthens the effect. Advanced countries are also more likely to be influenced.

Deng et al. (2023) analysed the impact of EPU on the liability side of banks in China. The regression results indicate that EPU reduces the size of time deposits and increases the amount of demand deposits. In order to minimise the impact of EPU, companies and individuals alter their cash-holding behaviours and mainly utilise demand deposits for cash hoarding due to preventive demand motives.

Ge et al. (2023) examined the impact of monetary policy uncertainty on bank risk-taking in China. The regression results indicate that banks in an environment of intensified competition tend to take on more risk when the level of uncertainty increases. This uncertainty leads to increased bank risk through deteriorating profitability and balance sheets.

Dang and Nguyen (2022) investigated the impact of uncertainty on bank profitability in Vietnam. The sample data consisted of 383 observations from 31 banks from 2007 to 2019. Their results indicate that net interest income is negatively correlated with a higher level of uncertainty, while non-interest income exhibits the opposite relationship. A preference for maintaining more liquid assets, which often gives lower returns, is brought on by high uncertainty. Furthermore, banks may offer lower lending rates and higher

deposit rates, which lowers net interest revenue. Besides that, higher uncertainty levels could improve the performance of non-interest income.

Wu et al. (2021) examined the impact of economic uncertainty on banks' soundness in emerging Asian economies. The sample data covered 500 banks in seven emerging countries from 2000 to 2016. EPU was found to reduce banks' soundness. This can be explained by the fact that EPU slows down the growth of bank credit and reduces interest rate spreads.

Kim et al. (2023) analysed the impact of uncertainty based on bank firm-bank matched data in Korea. They found that at higher levels of uncertainty, firms reduce their credit demand while banks reduce their credit supply. The above was achieved through the real-options channel and the financial channel.

Wang et al. (2022) analysed the impact of EPU on banks' liquidity creation in 24 countries from 1985 to 2012. The regression results indicate that liability-side liquidity creation benefits from EPU, whereas asset-side liquidity creation is harmed. Customers typically deposit money in banks out of fear and EPU depresses bank credit.

Shabir et al. (2021) investigated the impact of EPU on bank stability in 24 countries. The sample data consisted of 22,215 observations from 1,481 banks from 2005 to 2019. The regression results indicate that EPU reduces bank stability. Information asymmetries could be made worse by EPU, which heightens the issues of adverse selection and threatens the stability of the banking industry. During periods with high EPU, banks are less prone to take

risks. A high level of EPU disrupts the stock market and exchange market, leading to increased costs for bank loans and external financing for companies.

Table 2.8 summarises the literature on the EPU-banks' efficiency nexus.

Table 2.8 : Literature Matrix for EPU-Banks' Efficiency Nexus

Author	Country/Period	Variables	Results
Wei et al. (2022)	China/2003-2019	EPU, energy efficiency	EPU reduces energy efficiency
Tarkom and Ujah (2023)	US/ 1990-2018	EPU, firm efficiency	EPU reduces firm efficiency
Yu et al. (2024)	China/2005-2021	EPU, green efficiency	EPU reduces green efficiency
Frijns et al. (2023)	US/ 2010-2020	Uncertainty, informational efficiency	Uncertainty reduces informational efficiency
Zhou et al. (2023)	China/2011-2020	Uncertainty, corporate innovation efficiency	Uncertainty reduces efficiency
Li et al. (2021)	China/2001-2014	Uncertainty, energy efficiency	Uncertainty reduces energy efficiency
Cheng (2019)	China/2000-2010	EPU, capital management efficiency	EPU reduces efficiency
Luo et al. (2020)	China/2000-2015	Uncertainty, labour investment efficiency	Uncertainty reduces efficiency
Doan et al. (2020)	25 countries/2007-2016	EPU, firms' performance	EPU reduces firms' performance
Kong et al. (2022)	China/2007-2019	EPU, the risk of investment	EPU increases the risk of investment
Danisman and Tarazi (2024)	US/2011Q1 to 2020Q3	EPU, bank stability	EPU decreases bank stability
Bilgin et al. (2021)	20 countries/ 2009-2018.	EPU, bank stability	EPU reduces the stability of banks.
Ozili and Arun (2023)	22 advanced countries/1998-2017	EPU, bank profitability	EPU reduces bank profitability.
Nguyen (2021)	Eight major European countries/2005-2020	EPU, bank stability	EPU reduces bank stability

Table 2.8 : Continued

Author	Country/Period	Variables	Results
Shabir et al. (2023)	19 countries/ 2009- 2020	EPU, banks' risk	EPU increases banks' risk
Shabir et al. (2022)	19 countries/ 2006- 2018.	EPU, bank lending	EPU reduces bank lending
Deng et al. (2023)	China/2009-2017	EPU, liability side of banks	EPU reduces the size of time deposits and increases the amount of demand deposits
Ge et al. (2023)	China/ 2007–2020	Monetary policy uncertainty, bank risk-taking	This uncertainty leads to increased bank risk
Dang and Nguyen (2022)	Vietnam/2007-2019	Uncertainty, bank profitability	Net interest income is negatively correlated with a higher level of uncertainty, while non-interest income exhibits the opposite relationship
Wu et al. (2021)	Seven emerging countries/2000-2016	EPU, banks' soundness	EPU reduces banks' soundness
Kim et al. (2023)	Korea/2006-2015	Uncertainty, credit demand credit supply	At higher levels of uncertainty, firms reduce their credit demand while banks reduce credit supply.
Wang et al. (2022)	24 countries/ 1985-2012.	EPU, banks' liquidity creation	Liability-side liquidity creation benefits from EPU, whereas asset-side liquidity creation is harmed.
Shabir et al. (2021)	24 countries/2005-2019	EPU, bank stability	EPU reduces bank stability

To sum up, EPU may have a crucial moderating impact on banks' efficiency.

The majority of the research indicates that EPU is negatively correlated with institutions' soundness (Wu et al., 2021), profitability (Dang & Nguyen, 2022; Ozili & Arun, 2023), and stability (Bilgin et al., 2021; Danisman & Tarazi, 2024; Nguyen, 2021), while EPU and institutions' risk (Ge et al., 2023) are positively associated. In fact, few research examining the moderating role of EPU on the

efficiency have been discovered in the prior literature. Therefore, the current study will close that gap.

2.5 Summary on Gaps of Literature

In summary, the literature on the relationship between CG, globalisation, EPU and the entities' performance is not entirely clear, deeming further study necessary to clarify this relationship.

First, plenty of research has been done to investigate the association between COC and the entities. Some studies conclude that COC increases entities' productivity (Le et al., 2021) and stability (Alshubiri et al., 2023), supporting the Grease the Wheels theory. In contrast, other studies found that COC negatively impacts entities' efficiency (Haschka et al., 2023; Orudzheva et al., 2024), productivity (Kong et al., 2020), performance (Alam et al., 2020), and price efficiency (Kamarudin et al., 2018), which contradicts the Grease the Wheels theory. Therefore, due to the distinct banking structures and varying levels of financial development, the impact of COC on bank efficiency may differ across the three main Islamic hubs in the current study.

Second, the connection between VA and entities is the subject of a great deal of research. VA is beneficial for productivity, revenue efficiency, price efficiency, and performance (Alam et al., 2020; Kamarudin et al., 2016, 2018; Le et al., 2021), supporting the Principal-Agent Theory. However, the study by Cordella & Yeyati (1998) contradicts this theory, arguing that a more VA environment can be negatively correlated with productivity. Considering the

different methods of calculating efficiency and the distinct characteristics of the three Islamic banking hubs, the current study examines the impact of VA on bank efficiency across these three main Islamic hubs.

Third, the analysis between trade globalisation and entities has been performed by plenty of scholars. Trade globalisation and institutions' performance or efficiency have been shown to be positively correlated (Liu et al., 2023; Sufian, 2016; Sufian & Kamarudin, 2016), confirming the Theory of Trade. However, the study by Akdoğan (2018) challenges this theory, finding a negative relationship. Therefore, the current study investigates the effect of Trade globalisation on bank efficiency across these three main Islamic hubs, taking into account the various approaches used to calculate efficiency as well as the unique features of the three Islamic banking hubs.

Fourth, previous studies have investigated the impact of financial globalisation on entities. Many scholars conclude that financial globalisation is positively associated with institutions' performance, profitability, and efficiency (Gaies & Jahmane, 2022; Karkowska & Pruszyńska, 2018; Sufian & Kamarudin, 2016), supporting the Financial Development Theory. However, some empirical studies, such as those by Yakubu and Bunyaminu (2022), found a negative link, challenging this theory. Taking into consideration the distinctive characteristics of the three Islamic banking hubs, the current study examines the impact of financial globalisation on bank efficiency in three Islamic banking hubs.

Fifth, the link between interpersonal globalisation and the entities is the subject of extant research. Some scholars argue that there is a negative relationship between interpersonal globalisation and entities' productivity (Sufian & Habibullah, 2014), supporting the Social Friction Theory. However, other scholars found a positive association (Sufian & Habibullah, 2012; Sufian & Kamarudin, 2016; W Jubilee et al., 2022), contesting this viewpoint. In light of the unique features of the three Islamic banking centres, the current study investigates how interpersonal globalisation affected bank efficiency in these three hubs.

Sixth, numerous studies have examined the association between informational globalisation and entities' performance. The majority of existing research concludes that informational globalisation reduces institutions' productivity, efficiency, or performance (Sufian & Kamarudin, 2016; W Jubilee et al., 2022), supporting the Theory of Information Security. However, the analysis performed by Hussain et al. (2021) rejects this theory. Given the distinctive characteristics of the three Islamic banking hubs, the current study explores the role of informational globalisation in influencing bank efficiency across these hubs.

Seventh, the Social Friction Theory was confirmed by W Jubilee et al. (2022), who found a negative impact of cultural globalisation on bank productivity. However, this view is challenged by the positive relationship between cultural globalisation and institutional efficiency observed by Hussain et al. (2021) and Sufian et al. (2017). By combining the unique characteristics of the three

Islamic banking hubs, the current study offers a distinctive perspective on how cultural globalisation affects bank efficiency across these hubs.

Finally, regarding the moderator analysis, previous studies have evaluated the effect of EPU on institutions' soundness (Wu et al., 2021), profitability (Dang & Nguyen, 2022; Ozili & Arun, 2023), stability (Bilgin et al., 2021; Danisman & Tarazi, 2024; Nguyen, 2021) and institutions' risk (Ge et al., 2023). However, current studies have overlooked the indirect effect of EPU on the impact of CG and globalisation on banks' efficiency. According to Theory of Uncertainty, uncertainty can intensify information asymmetry between banks and borrowers. Through an analysis of a panel of three main Islamic hubs, the current study adds to the body of research on bank literature by examining the moderating effect of EPU on the impact of CG and globalisation on banks' efficiency.

The following Chapter 3 outlines the resources and methodology used to investigate these complex relationships. It begins by detailing the data collection process and the research techniques employed in this study. Specifically, the chapter introduces the two-stage analysis approach, which includes the use of the DEA model to assess bank efficiency in the first stage. In the second stage, panel regression methods, including OLS, FEM, and REM, were applied to analyse the impact of CG and globalisation on bank efficiency. To ensure robustness, the IV-2SLS technique was also employed. This methodological approach enables a thorough examination of the

research objectives and sets the foundation for the analysis and interpretation of the results, discussed in the subsequent chapter.



CHAPTER 3

DATA AND RESEARCH METHODOLOGY

3.1 Introduction

This chapter is divided into three parts. The first part provides a brief introduction of how the data was collected. The second part introduces the method of calculating the efficiency score, namely, the DEA. In the final part, a brief introduction to the second stage analysis. It also explains the use of the pooled OLS, FEM, REM, and IV-2SLS technique.

3.2 Source of Data and Data Selection

To examine the impact of EPU on the efficiency of CBs and IBs in three regions of key emerging hubs of Islamic banking and finance, data was drawn from multiple sources. First, the main variables were sourced from four databases. Data related to EPU were taken from the WUI (Ahir et al., 2022). The index is available for the period of 1952 to 2023. The globalisation index came from KOF Globalisation (Dreher, 2006; Gygli et al., 2019), which is available for the period of 1970 to 2021. The detailed description of the globalisation index can be seen in Appendix A. The CG index was from the Worldwide Governance database (Kaufmann & Kraay, 2023), which is available for the period of 1996 to 2022. Data for generating the efficiency score was from the Bank Focus database, which provided the banks' balance sheets and income statements and covered a wide range of banks around the world.

In order to maintain homogeneity, this study excluded all finance companies, insurance companies, and investment banks. All data were supplemented by a linear interpolation method. In this study, the following countries were selected: Bangladesh, Egypt, Indonesia, Iraq, Islamic Republic of Iran, Jordan, Kuwait, Lebanon, Malaysia, Pakistan, Qatar, Saudi Arabia, Singapore, Turkey, and United Arab Emirates. The unbalanced panel of 6,176 bank-year observations for 110 IBs and 353 CBs was obtained. The sample data covered the period from 2005 to 2021. While nearly 21.58% of the observations in this study related to IBs, this was considered similar to previous studies (Bakhouche et al., 2022; Izzeldin et al., 2021). The countries belonged to the regions of SA, SEA, and ME. Besides that, country-level control variables such as GDPG and CPI were retrieved from the World Development Indicators (WDI) database.

3.3 Method of Measurement

In this study, two stages of analysis were used. In the first step, the DEA method was employed to calculate the efficiency of both types of banks. In the second step of the analysis, the pooled and panel OLS, FEM, REM, and the IV-2SLS model was used. The second step was used to analyse the impact of CG and globalisation on the efficiency of both types of banks. Additionally, this study used the moderating effect of EPU on the impact of CG and globalisation on banks' efficiency.

3.3.1 First Stage Analysis

The DEA was employed in the first stage as it is widely used and accepted and does not impose particularly strong constraints. Farrell (1957) held the opinion that the main reason for people's efforts to solve the problem of production efficiency measurement is the failure to find a measurement standard that could solve multiple inputs and outputs in the past; hence, the DEA method is the solution to this problem. The most efficient level is "1", or 100%, while a level under "1" indicates inefficiency.

Charnes et al. (1978) proposed the DEA method based on previous research findings. Their findings solved the difficulty of evaluating the relative efficiency of multiple investments and products. In a set of comparable DMUs, this method can determine the DMUs that show the best practice that forms an effective frontier. The ratio of output is the relative efficiency of the structure (input) output, also known as TE, which is higher when more outputs can be generated from a given set of inputs. Sherman and Gold (1985) introduced the DEA model to evaluate the performance of banks for the first time.

There are two basic DEA models: the Charnes, Cooper, and Rhodes (CCR) model and the Banker, Charnes, and Cooper (BCC) model. The CCR model (Charnes et al., 1978) is a model under the assumption of the CRS. The BCC model (Banker et al., 1984) operates under the assumption of the VRS. This study follows the studies of Jubilee et al. (2021), Kamarudin (2015) and W Jubilee et al. (2022) in employing estimates of efficiency levels under the assumption of VRS. Because not all banks perform at their best, the VRS

technique was used. The most efficient level is “1”, or 100%, while levels under “1” indicates inefficiency.

The CCR model implies that there is no link between scale and efficiency based on the assumption of CRS. The assumption is correct in the condition that all DMUs are functioning at their best. The above condition is the ideal mode while in reality, not all DMUs operate well, which means the computed measures of TE can be tainted with scale inefficiency.

Banker et al. (1984) made an improvement to the CCR model by loosening the condition of CRS. Therefore, the efficiency of DMUs is calculated by the new model based on the assumption of VRS.

Assuming that there is a group of DMUs and they can be presented with the $\{DMU_j; j=1,2,3,4\dots n\}$, each DMU has m kinds of inputs and s kinds of outputs, where $\{x_{ij}; i=1,2,3,4\dots m\}$ and $\{y_{rj}; r=1,2,3,4\dots s\}$ are the vector of inputs and outputs.

According to Farrell (1957), efficiency is the reflection of the ability of a unit to obtain optimum output when there is a given set of inputs. When one company is assumed to use one kind of input and generates one kind of output, the following equation can be the simplest way to measure efficiency:

$$Te = \frac{y_1}{x_1} \quad (3.1)$$

to obtain the maximum output from a given set of inputs.

According to the definition of Charnes et al. (1978), the efficiency of DMUs can be expressed by the following:

$$Te = \frac{\sum_r u_r y_{rj}}{\sum_i v_i x_{ij}} \quad (3.2)$$

where:

v_i = the weight assigned to input i

x_{ij} = the level of input i used by unit j

u_r = the weight assigned to output r

y_{rj} = the level of output r produced by unit j

Researchers have not reached an agreement on the definition and measurement of bank inputs and outputs in the banking function (Sufian, 2007), and a different selection of input and output variables in analysing bank efficiency can lead to different results. The problem of the different selection of efficiency calculation worsens due to the availability of data. For instance, costs cannot be differentiated for each revenue object, making it difficult to make accurate efficiency calculations.

In the current study, banks were assumed to perform an intermediary role between borrowers and depositors. The decisions made in earlier research served as a reference for choosing the inputs, which were (1) deposits and short term funding (Alexakis et al., 2019; Barth et al., 2013; Jaffar & Manarvi, 2011; Jubilee et al., 2021; W Jubilee et al., 2022) and (2) fixed assets (Alexakis et al., 2019; Barth et al., 2013; Haque & Brown, 2017; Jaffar & Manarvi, 2011; Jubilee et al., 2021; Mirzaei et al., 2022; Shahwan & Habib, 2023; W Jubilee

et al., 2022). In line with the work of past researchers (Haque & Brown, 2017; Mateev et al., 2022; Mirzaei et al., 2022; T. L. A. Nguyen, 2018; W Jubilee et al., 2022), (1) loans and (2) total financial assets (securities) were chosen as the output variable. CBs earn money from the spread between lending interest and borrowing interest rates. IBs have a similar spread which is defined in terms of profit share ratios between entrepreneurs (borrowers) and depositors (lenders). Fixed assets were included to represent one kind of input like houses and machines. All the variables used in the DEA models in first stage of analysis are listed in Table 3.1.

Table 3.1 : DEA Inputs and Outputs

	Variables	Definition	Reference
	Inputs		
X1	Deposits	Deposits & short-term funding	(Alexakis et al., 2019; Barth, Lin, et al., 2013; Jaffar & Manarvi, 2011; Jubilee et al., 2021; W Jubilee et al., 2022)
X2	Physical capital	Fixed Assets	(Alexakis et al., 2019; Barth et al., 2013; Haque & Brown, 2017; Jaffar & Manarvi, 2011; Jubilee et al., 2021; Mirzaei et al., 2022; Shahwan & Habib, 2023; W Jubilee et al., 2022)
	Outputs		
Y1	Loan	Gross loans	(Haque & Brown, 2017; Mateev et al., 2022)
Y2	Investment	Total financial assets: securities	(Mirzaei et al., 2022; W Jubilee et al., 2022)

3.3.2 Second Stage Analysis

In order to investigate the relationship between CG, globalisation, EPU and bank efficiency, the second stage of data analysis includes panel regression analysis. This stage examines the impact of CG on bank efficiency and the impact of globalisation on bank efficiency. This stage also examines the

moderating influence of EPU on the relationship between CG and bank efficiency as well as the moderating influence of EPU on the relationship between globalisation and bank efficiency. Additionally, a robustness test provided by the IV-2SLS estimate model was developed.

3.3.2.1 Regression Model

3.3.2.1.1 Panel Regression Analysis

In this stage, the impact of CG (first objective) and globalisation (second objective) on the efficiency of both types of banks were examined. Additionally, the moderating effect of EPU on the impact of CG (third objective) and globalisation (fourth objective) on banks' efficiency were examined. All regression tests applied the stepwise regression approach in the estimation to address the high multicollinearity (more than 0.8) issue.

Three methods were utilised for data analysis, which were pooled OLS, FEM, and REM. To determine the appropriate approach for the analysis, the BP and LM tests were first conducted to decide whether pooled data or panel data was more suitable. In general, if the p-value of the BP and LM Chi-Square (X^2) tests is significant, panel data is preferred over pooled data. Next, the Hausman test was used to identify the most appropriate model between FEM and REM for the panel data. The null hypothesis of the Hausman test suggests that FEM and REM models do not differ significantly. If the Hausman test result is significant at the 1% or 5% level, FEM is chosen; otherwise, the REM is deemed more appropriate (Kamarudin et al., 2022). Figure 3.1 depicts the decision flowchart for model selection.

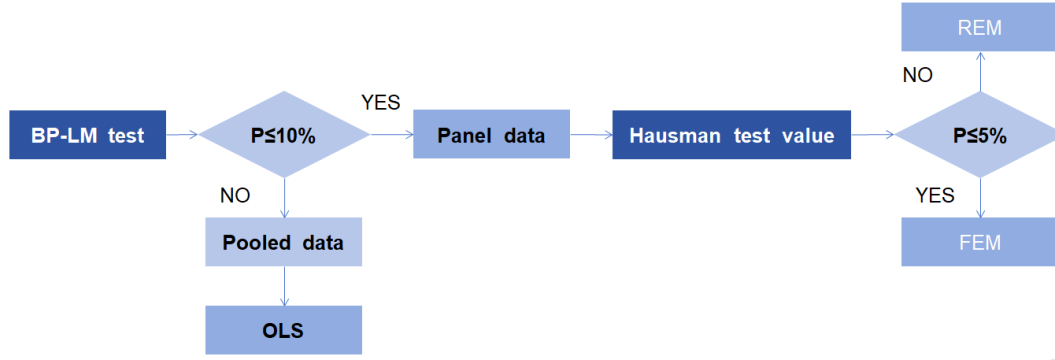


Figure 3.1 : Decision Flowchart for Model Selection

To find the link between the variables of this study and the efficiency of both types of banks, the following empirical equation was proposed:

Objective 1: To measure the effect of CG on bank efficiency.

Equation to test the relationship between CG and bank efficiency:

$$te_{it} = \alpha_0 + \alpha_1 COC_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.3)$$

$$te_{it} = \alpha_0 + \alpha_1 VA_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.4)$$

Objective 2: To measure the effect of globalisation on bank efficiency.

Equation to test the relationship between globalisation and bank efficiency:

$$te_{it} = \alpha_0 + \alpha_1 TrGI_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.5)$$

$$te_{it} = \alpha_0 + \alpha_1 FiGI_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.6)$$

$$te_{it} = \alpha_0 + \alpha_1 IpGI_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.7)$$

$$te_{it} = \alpha_0 + \alpha_1 InGI_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.8)$$

$$te_{it} = \alpha_0 + \alpha_1 CuGI_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.9)$$

Objective 3: To measure the moderation effect of EPU on the impact of CG on bank efficiency.

Equation to test the moderation effect of EPU on the impact of CG on bank efficiency:

$$te_{it} = \alpha_0 + \alpha_1 COC_{jt} + \delta_1 EPU_{jt} + \phi_1 COC_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.10)$$

$$te_{it} = \alpha_0 + \alpha_1 VA_{jt} + \delta_1 EPU_{jt} + \phi_1 VA_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.11)$$

Objective 4: To measure the moderation effect of EPU on the impact of globalisation on bank efficiency.

Equation to test the moderation effect of EPU on the impact of globalisation on bank efficiency:

$$te_{it} = \alpha_0 + \alpha_1 TrGI_{jt} + \delta_1 EPU_{jt} + \phi_1 TrGI_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.12)$$

$$te_{it} = \alpha_0 + \alpha_1 FiGI_{jt} + \delta_1 EPU_{jt} + \phi_1 FiGI_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.13)$$

$$te_{it} = \alpha_0 + \alpha_1 IpGI_{jt} + \delta_1 EPU_{jt} + \phi_1 IpGI_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.14)$$

$$te_{it} = \alpha_0 + \alpha_1 InGI_{jt} + \delta_1 EPU_{jt} + \phi_1 InGI_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.15)$$

$$te_{it} = \alpha_0 + \alpha_1 CuGI_{jt} + \delta_1 EPU_{jt} + \phi_1 CuGI_{jt} * EPU_{jt} + \beta_1 size_{it} + \beta_2 capital_{it} + \beta_3 quality_{it} + \chi_1 CPI_{jt} + \chi_2 GDPG_{jt} + \chi_3 COVID_{jt} + \varepsilon_{it} \quad (3.16)$$

where:

te_{it} = Technical efficiency of bank i at

time t

COC_{jt}	Control of corruption of country j at time t
VA_{jt}	Voice and accountability of country j at time t
$TrGI_{jt}$	Trade globalisation of country j at time t
$FiGI_{jt}$	Financial globalisation of country j at time t
$IpGI_{jt}$	Interpersonal globalisation of country j at time t
$InGI_{jt}$	Informational globalisation of country j at time t
$CuGI_{jt}$	Cultural globalisation of country j at time t
EPU_{jt}	Economic policy uncertainty of country j at time t
$size_{it}$	The total asset of bank i at time t(log term)
$capital_{it}$	Equity over total assets of bank i at time t
$quality_{it}$	Loan loss reserve over gross loan of bank i at time t
$GDPG_{jt}$	Gross domestic production growth of country j at time t
CPI_{jt}	Consumer price index of country j at time t
$COVID_{jt}$	COVID of country j at time t

The equation for assessing the impact of CG on bank efficiency is shown in equation (3.3) and equation (3.4). Equations (3.5) to (3.9) illustrate the model used to quantify how globalisation affects bank efficiency. Additionally, equations (3.10) and (3.11) illustrate how EPU moderates the relationship between CG and bank efficiency. Finally, equations (3.12) to (3.16) illustrate how EPU moderates the relationship between globalisation and bank efficiency.

3.3.2.1.2 Robustness Test

When the independent variables in a regression equation are correlated with the disturbance term, the IV and 2SLS techniques are useful (Sohail & Din, 2024). Reiersøl (1941) proposed the IV method, which can correct for endogeneity arising from measurement errors in the independent variables. An IV is a variable that is correlated with the "endogenous" independent variable but uncorrelated with the disturbance term. The method involves fitting the instrumental variables to the endogenous variables. Then, IV must be combined with 2SLS, resulting in the IV-2SLS method. The process of this method is as follows: in the first stage, the endogenous variables are predicted using the instrumental variables. In the second stage, the predicted values of the endogenous variables from the first stage are used as explanatory variables in a regression model with the dependent variable.

To overcome endogeneity concerns, based on past research (Ju et al., 2023; Xu et al., 2022) the IV-2SLS was employed in the current study. Lagged independent variables were used as instruments in the current study in accordance with earlier research (Kpognon, 2022). Because lagged variables only represent previous states, they were unlikely to have a direct correlation with the current error term, but they usually have a high correlation with the current independent variables.

3.3.2.2 Variables Description

This study included five types of variables, namely (1) bank-level control variables, (2) country-level control variables, (3) CG, (4) globalisation and (5)

EPU. The bank-level control variables encompassed bank size (size), capitalisation (capital), and credit risk (quality). The country-level control variables encompassed GDPG, CPI and COVID. CG consisted of COC and VA. Globalisation consisted of trade globalisation (denoted as TrGI), financial globalisation (denoted as FiGI), interpersonal globalisation (denoted as IpGI), informational globalisation (denoted as InGI), and cultural globalisation (denoted as CuGI). EPU was measured via the WUI.

3.3.2.2.1 Bank-Level Control Variables

3.3.2.2.1.1 Bank Size

Bank size was measured by using the natural logarithm of total asset and the sign was expected to be positive or negative. A positive sign means increases in the size of banks are associated on average with increases in banks' efficiency. A positive sign may indicate that advantages such as economies of scale (Alqahtani et al., 2017) and good management (Rosman et al., 2014) are associated with a larger size, which outweighs the drawbacks. Eichengreen and Gibson (2001) concluded that bank asset growth within a certain range has a positive effect on efficiency, but exceeding this range may lead to negative effects due to bureaucratic or other factors. All in all, two impacts of the size of banks were expected. This factor may either enhance the efficiency of banks due to economies of scale or hinder efficiency due to managerial problems (Isik & Hassan, 2003) and challenges in monitoring (Doumplos et al., 2017).

3.3.2.2.1.2 Credit Risk

Credit risk (quality) was represented by loan loss provision over gross loans. This ratio measures the proportion of loan loss provisions to gross loans and is an indicator of asset quality. This variable was expected to exhibit either a positive or negative correlation with the efficiency of banks (Berger & DeYoung, 1997; Kamarudin et al., 2016, 2022; Sufian, 2007; Sufian & Habibullah, 2009; W Jubilee et al., 2022). A higher credit risk indicates that the loans applied by customers will be a bad loan and worsen the quality of banks' asset. Additionally, higher credit risk can be associated with poorer management, which will lead to a higher managerial cost. However, the skimping hypothesis, as proposed by Berger and DeYoung (1997), suggests that banks can enhance their performance in a short time by reducing the monitoring costs associated with loans.

3.3.2.2.1.3 Capitalisation

The proportion of equity in the number of total assets was selected to measure the level of capitalisation (capital). The sign of this variable was expected to be positive or negative. On one hand, a positive sign means a higher level of capitalisation can foster banks' efficiency, which can contribute to a stable operating environment because less money will be lent from outside. A higher proportion of equity will also encourage shareholders to invest more effort in monitoring managers' actions, thereby mitigating agency problems and improving efficiency. On the other hand, some researchers (Alqahtani et al., 2017; Safiullah, 2021; VanHoose, 2007) reported a negative relationship as

focusing too much on this ratio may make banks operate too cautiously and miss the opportunity to access some profitable programmes (Alqahtani et al., 2017). Additionally, according to Miller Modigliani's theory, proper debt financing will contribute to the entire performance of the company. The optimal capital structure should also be based on bankruptcy costs as well as taxes.

3.3.2.2.2 Country-level Control Variables

3.3.2.2.2.1 Economic Growth

GDPG is the real GDPG rate. This ratio was included as the proxy of economic growth in the regression model and was expected to be positive or negative. When the GDP shows a good trend, firms will have more opportunities for investment and borrowers will be less likely to default on their debts. If economic conditions worsen, the public's income stability may be compromised, leading to a potential deterioration in credit quality and a higher ratio of loan defaults. Banks tend to absorb more deposits and produce more cash flows in high-income countries (Srairi, 2010). However, the negative sign has also been documented in the link between economic growth and bank efficiency. If firms invest more in high-risk programmes in good economic conditions, the financing provided by banks will be more frequently defaulted. Therefore, banks will suffer the aftermath of the failure in investment and decreased efficiency (El Moussawi & Mansour, 2022). Favourable economic trends also bolster corporate funding, with low-cost and low-risk internal financing reducing reliance on external financing channels including banks, which leads to decreased profitability (Kamarudin et al., 2016).

3.3.2.2.2 Inflation

CPI was selected to measure the level of inflation, which is proxied by consumer price index. The sign of this variable was expected to be positive or negative. Perry (1992) explained the two-side effect of CPI on banks' performance, where if banks predict inflation level correctly, then managers can adjust the interest accordingly and banks will earn profit. In contrast, incorrect predictions of the inflation level will harm the profits of banks. On the one hand, the negative impact of information asymmetry will deteriorate and banks will operate more cautiously and cut some uncertain or risky programmes during the inflation period (Kamarudin et al., 2017). On the other hand, a positive relationship can also be found in the studies of Sufian and Kamarudin (2012) and W Jubilee et al. (2022). Banks can mitigate the adverse effects of CPI by accurately anticipating it and appropriately adjusting the interest rates.

3.3.2.2.3 COVID

The outside environment that encompasses the economic, financial, or political environment that banks operate in may influence the daily operation of banks. The COVID-19 epidemic, being a significant health catastrophe, has garnered widespread scholarly attention and has notably impacted the efficiency of banks. Some scholars contend that the event has no impact on banks, as documented by Gulati et al. (2023) who highlighted that through the implementation of a series of policy interventions and a cycle of monetary tightening by regulators, banks continue to operate normally. However, a

negative relationship can also be found in the studies of Arafat et al. (2021) and Shabir et al. (2023) who opined that the pandemic had increased the probability of defaults, leading to a deterioration in the asset quality of banks. Additionally, a positive correlation was also documented. In line with Mehmood and De Luca (2023), the current study considered COVID as a dummy variable that equals “1” if the years belonged to the COVID-19 pandemic period (2020-2021).

3.3.2.2.3 Country Governance

CG data was sourced from the WGI dataset (Kaufmann & Kraay, 2023), a global dataset that aggregates perceptions of governance quality from households, businesses, and citizens worldwide. The information from the WGI dataset reflects the various perspectives on governance held by numerous global stakeholders, including thousands of experts and survey participants.

These data were selected based on three main standards: they were updated on a regular basis, they were produced by reliable organisations, and they offered comparable cross-national data. CG data ranged from -2.5 to 2.5, with higher values indicating better CG. To examine the impact of CG on banks' efficiency, the current study used COC and VA as dimensions of CG.

The perceptions of the degree to which a nation's population can choose their government, as well as freedom of expression, freedom of association, and free media, are captured by VA (Kaufmann & Kraay, 2023). The perceptions

of the degree to which public power is used for personal benefit, including both small-scale and large-scale corruption, as well as the "capturing" of the state by elites and private interests, are captured by the COC (Kaufmann & Kraay, 2023).

3.3.2.2.4 Globalisation

The KOF globalisation index is a dataset introduced by Dreher (2006) and developed by Gygli et al. (2019). This study chose TrGI, FiGI, IpGI, InGI, and CuGI as the dependent variables. Based on the database, every variable is transformed into an index with a scale from 1 to 100, where a higher value indicates a higher level of globalisation. Detailed information about these indices is as follows: (i) trade globalisation (income payments to foreign nationals, portfolio investment, FDI, and trade); (ii) financial globalisation (hidden tariff rates, mean tariff rates, taxes on international trade, and capital account restrictions); (iii) interpersonal globalisation (international trade, foreign population, international tourism, transfer, telephone traffic); (iv) informational globalisation (trade in newspapers, television, internet users); and (v) cultural globalisation (number of trade-in books, IKEA outlets, and McDonald's restaurants).

3.3.2.2.5 EPU

EPU is designed to show the level of uncertainty. EPU can be accessed in the WUI database, which was constructed by Ahir et al. (2022). This index comprises data of 143 countries from 1950s onwards. This index was constructed by tallying the number of times the term "uncertainty" (or a

synonym) appears in reports from the EIU (Ahir et al., 2022; Luo et al., 2024). The EPU index has several advantages. First, during large uncertainty-generating events such as the 9/11 attacks, SARS epidemic, and US presidential elections, the EPU index is able to capture the worldwide peaks of uncertainty surrounding these events (Ahir et al., 2022). Second, this index is continuous and can reflect uncertainty during both normal and abnormal times, making it more useful than a dummy variable. Third, the data comes from a single source (the EIU), renowned for its exceptionally high accuracy. Another economic uncertainty index constructed by Baker et al. (2016) is less reliable since they count newspaper coverage frequency, where a higher value reveals a more uncertain environment. Following the study of Bilgin et al. (2021), this study averaged quarterly data to generate yearly data.

To examine the moderating effect of EPU on the impact of CG and globalisation on banks' efficiency, this study came up with interaction variables (COC* EPU, VA* EPU, TrGI* EPU, FiGI* EPU, IpGI* EPU, InGI* EPU, CuGI* EPU). It was anticipated that these interaction variables would have heterogeneous coefficient signs. Consistent signs would indicate that EPU reinforces the relationship between CG and globalisation and banks' efficiency, whereas opposing signs would suggest that EPU weakens this relationship.

3.4 Hypothesis Development

3.4.1 Country Governance

3.4.1.1 Control of Corruption

COC captures the perception of the extent to which public power is abused for personal benefit, including both petty and grand corruption, as well as the "state capture" by elites and private interests (Kaufmann & Kraay, 2023). The COC indicator incorporates a variety of data sources, including the Gallup World Poll, which measures the level of corruption in government institutions; the EIU, which evaluates corruption among public officials; and the Global Competitiveness Survey, which identifies irregular payments and diversion of public funds. These sites cover a wide range of corruption topics, including business bribery and public officials abusing their position of authority. Le et al. (2021) argued COC reduce firm's productivity in Vietnam. In dysfunctional market contexts, bribery frequently provides a dependable way to obtain limited government resources, enabling businesses to get around government flaws. Alshubiri et al. (2023) found that COC reduces banking stability in high-income countries. Investors can more readily achieve their personal goals by evading legal limits due to corruption (Alshubiri et al., 2023). Bougatef (2017) concluded that corruption increases banks' profitability in Tunisia as lack of fierce bank competition in Tunisia may lead to loan corruption, which leads to profiting from corruption.

According to the "Grease the Wheels" theory, corruption may positively influence a bank's efficiency. Therefore, the COC is negatively correlated with a bank's efficiency. Accordingly, the following hypotheses were formulated:

H1(1a): COC has a negative influence on CBs' efficiency.

H1(1b): COC has a negative influence on IBs' efficiency.

3.4.1.2 Voice and Accountability

The VA indicator measures freedoms of expression, association, and the media, as well as the degree to which individuals can choose their government (Kaufmann & Kraay, 2023). The VA indicator draws on a wide range of data sources, such as the EIU, which evaluates democracy and accountability; Freedom House, which assesses political rights and civil liberties; and the Gallup World Poll, which measures confidence in elections and satisfaction with democratic processes. Since individuals' capacity to hold governments responsible and obtain free, varied information promotes openness, lowers policy uncertainty, and builds institutional confidence, the VA indicator is essential for analysing its impact on bank efficiency.

The VA metric offers crucial insights into the larger governance environment influencing financial and institutional performance by reflecting the calibre of governance and public participation. For example, VA fosters democracy and reduces poverty by encouraging active participation from both officials and citizens, thereby enhancing bank price efficiency (Kamarudin et al., 2018). Similarly, Kamarudin et al. (2016) argue that VA works to fight poverty and promote democracy through the active participation of people and

governmental organisations, which may improve banks' revenue efficiency. Another study by Alam et al. (2020) concluded that VA is positively correlated with firm performance. Managers are held accountable by VA, which impacts all types of investments. Furthermore, high VA also ensures responsible decisions, actions, and commitment to finishing the task and indicates higher democracy and transparency. Akhigbe et al. (2013) argue that transparency increases profit efficiency. Since transparency is associated with more reliable information sharing between a company's internal processes and its investors, it improves management. According to the Principal-Agent theory, higher VA enhances the availability of public information and reduces conflicts between the government and the public in public governance. Consequently, this fosters improvements in entities' efficiency. Accordingly, the following hypotheses were formulated:

H1(2a): VA has a significant positive influence on CBs' efficiency.

H1(2b): VA has a significant positive influence on IBs' efficiency.

3.4.2 Globalisation

3.4.2.1 Trade Globalisation

Trade globalisation involves several dimensions, each playing a role in the interconnectedness of economies and impacting banking efficiency. Key aspects include trade in goods and services (measuring the ratio of goods and services trade to GDP) as well as trade agreements and partner diversity (reflecting the breadth and strength of international trade relationships) (Dreher, 2006; Gygli et al., 2019). These factors influence various aspects of

a country's economy and can further affect bank efficiency. Zhang and Daly (2014) argue that economic globalisation increases banks' performance. Increased trade activity helps banks' bottom lines. Furthermore, the banking industry is now more competitive as a result of this liberalisation. Similarly, Sufian (2016) concluded that globalisation increases bank efficiency due to intensified competition and the erosion of monopolistic profits. Sufian and Kamarudin (2016) also conclude that globalisation is positively correlated with bank performance due to the benefits from higher trade flows. Besides that, trade globalisation can drive technological innovation and promote stronger economic growth, potentially enhancing banks' efficiency (Liu et al., 2023). A study by Yao et al. (2021) found that trade increases energy efficiency due to economies of scale, green technology, and knowledge from outside. Based on the Theory of Trade, trade globalisation can stimulate economic growth, which may increase the demand for banking services. Therefore, bank efficiency can be improved. Accordingly, the following hypotheses were formulated:

H2(1a): Trade globalisation has a significant positive influence on CBs' efficiency.

H2(1b): Trade globalisation has a significant positive influence on IBs' efficiency.

3.4.2.2 Financial Globalisation

Financial globalisation encompasses a range of factors that shape cross-border financial integration and influence banking efficiency. Key components include FDI (reflecting the stock of foreign investment relative to GDP) and

portfolio investment (measuring international equity investments relative to GDP) (Dreher, 2006; Gygli et al., 2019). These components demonstrate the extent of financial openness and connectedness, which has a direct bearing on banks' productivity and competitiveness. Sufian and Kamarudin (2016) concluded that financial globalisation is positively correlated with bank performance. Capital account liberalisation is followed by financial sector liberalisation. When financial liberalisation increases competition, monopolistic profits usually decrease. Another study conducted by Gaies and Jahmane (2022) also confirms the positive impact of financial globalisation on bank profitability. Banks' savings, financial resources, and client base grew as a result of further integration into the global economy, which improved banks' profitability. Furthermore, there is a negative correlation between bank efficiency and constraints on globalisation as argued by Sufian and Habibullah (2012). According to Financial Development Theory, financial globalisation stimulates competition and enables institutions to benefit from economies of scale, thereby enhancing bank efficiency. Accordingly, the following hypotheses were formulated:

H2(2a): Financial globalisation has a significant positive influence on CBs' efficiency.

H2(2b): Financial globalisation has a significant positive influence on IBs' efficiency.

3.4.2.3 Interpersonal Globalisation

The term "interpersonal globalisation" refers to the growing cross-border connectivity of people and cultures through various social and personal

interactions. Key elements include migration trends, which indicate the percentage of residents born outside the country, and international voice traffic, which measures international telephone communication relative to the population (Dreher, 2006; Gygli et al., 2019). These factors underscore the importance of human mobility and communication, as they shape the social and economic landscape, thereby influencing the efficiency of financial institutions. Interpersonal globalisation can affect bank efficiency in a number of ways. Excessive interpersonal globalisation without integration can also reduce bank efficiency. Foreign customer interaction practices may be at odds with local managers, which would hinder the development plan and impede banks' efficiency (Nguyen & Nguyen, 2018). According to the Social Friction Theory, interpersonal globalisation exacerbates information asymmetry (Jin & Wang, 2021) and increases the cost for social relationship management (ROTTIG & REUS, 2009), which may deteriorate bank operations. Accordingly, the following hypotheses were formulated:

H2(3a): Interpersonal globalisation has a significant negative influence on CBs' efficiency.

H2(3b): Interpersonal globalisation has a significant negative influence on IBs' efficiency.

3.4.2.4 Informational Globalisation

The term "information globalisation" refers to the increasing cross-border movement and accessibility of information, driven by advancements in communication and technology. Key components include internet bandwidth, which measures the overall capacity of international internet usage relative to

the population, and internet access, which tracks the proportion of the population using the internet (Dreher, 2006; Gygli et al., 2019). These elements facilitate data flow, which in turn can influence banking efficiency. Informational globalisation can affect bank efficiency in a number of ways. A lot of consumers in SEA still view internet banking as unsafe, mostly as a result of inadequate knowledge (W Jubilee et al., 2022). The lack of Internet and telecommunications specialists in developing nations also contribute to the underdevelopment of technologies. Therefore, informational globalisation may reduce bank efficiency. In addition, managing massive amounts of consumer data raises concerns about data privacy and regulatory compliance, which can increase costs and potentially reduce efficiency (Luo et al., 2023). Everyone benefits from technology, but those with higher levels of ability often gain more from the increasing information flows that come with increased globalisation (Sufian & Kamarudin, 2016). According to Theory of Information Security, informational globalisation introduces data security challenges, accompanied by the loss of customer trust, missed opportunities due to service interruptions, and costs associated with updating IT investments (Johnson, 2015; Uddin et al., 2020). Accordingly, the following hypotheses were formulated:

H2(4a): Informational globalisation has a significant negative influence on CBs' efficiency.

H2(4b): Informational globalisation has a significant negative influence on IBs' efficiency.

3.4.2.5 Cultural Globalisation

The term "cultural globalisation" refers to the increasing cross-border exchange and fusion of cultural elements influenced by social and economic factors. The number of McDonald's restaurants and IKEA stores is a key indicator of the expansion of global consumer culture (Dreher, 2006; Gygli et al., 2019). By fostering a more interconnected, diverse, and innovative environment, cultural globalisation can impact economic systems, particularly banking efficiency.

Cultural globalisation can affect bank efficiency in a number of ways. Sufian et al. (2017) contended that only banks with headquarters nearby can benefit from cultural globalisation due to aspects like shared languages and cultures as well as shorter travel times. Banks in SEA are inefficient due to lengthy procedures and excessive protocol introduced by Western country cultures (W Jubilee et al., 2022). According to the Social Friction Theory, cultural differences exacerbate suspicion among local entities (Newburry et al., 2006; Xu et al., 2024), requiring additional efforts to address this mistrust, which in turn undermines efficiency. Accordingly, the following hypotheses were formulated:

H2(5a): Cultural globalisation has a significant negative influence on CBs' efficiency.

H2(5b): Cultural globalisation has a significant negative influence on IBs' efficiency.

3.4.3 Economic Policy Uncertainty

EPU serves as the moderator in this study. Previous studies have established a negative association between EPU and bank behaviour. According to the Theory of Uncertainty, for firms, based on the Real Options Theory (Leslie & Michaels, 1997), the holder of a real option has some reactive flexibility; they can choose to invest or wait. Banks' profitability is lowered as a result of the "prudence effect" and "delay effect" of EPU on interest spreads and overall loan demand (Nguyen, 2021). Besides that, EPU can affect the creditworthiness of borrowers. Banks may need to increase provisions for loan losses, which can reduce their profitability and efficiency (Shabir et al., 2022). Finally, information asymmetries can be made worse by EPU (Brogaard & Detzel, 2015). The presence of asymmetric information increases banks' monitoring costs (Calomiris & Ramirez, 1996), thereby reducing their efficiency. EPU as a moderator is a strong determining or influencing factor within the bank. Although no previous study has examined this relationship, EPU could strengthen or weaken the relationship between CG and globalisation with bank efficiency. Therefore, a significant influence of EPU in the nexus was predicted.

Accordingly, the following hypotheses were formulated:

- H3(1a): There is a significant moderating role of EPU on the nexus between COC and CBs' efficiency.
- H3(1b): There is a significant moderating role of EPU on the nexus between COC and IBs' efficiency.

H3(2a): There is a significant moderating role of EPU on the nexus between VA and CBs' efficiency.

H3(2b): There is a significant moderating role of EPU on the nexus between VA and IBs' efficiency.

H4(1a): There is a significant moderating role of EPU on the nexus between trade globalisation and CBs' efficiency.

H4(1b): There is a significant moderating role of EPU on the nexus between trade globalisation and IBs' efficiency.

H4(2a): There is a significant moderating role of EPU on the nexus between financial globalisation and CBs' efficiency.

H4(2b): There is a significant moderating role of EPU on the nexus between financial globalisation and IBs' efficiency.

H4(3a): There is a significant moderating role of EPU on the nexus between interpersonal globalisation and CBs' efficiency.

H4(3b): There is a significant moderating role of EPU on the nexus between interpersonal globalisation and IBs' efficiency.

H4(4a): There is a significant moderating role of EPU on the nexus between informational globalisation and CBs' efficiency.

H4(4b): There is a significant moderating role of EPU on the nexus between informational globalisation and IBs' efficiency.

H4(5a): There is a significant moderating role of EPU on the nexus between cultural globalisation and CBs' efficiency.

H4(5b): There is a significant moderating role of EPU on the nexus between cultural globalisation and IBs' efficiency.

The summary of the description of the variables used in the regression models and hypothesised relationship are presented in Table 3.2.

Table 3.2 : Description of the Variables Used in the Regression Models

Variable	Description	Hypothesised Relationship
Dependent variable		
te	Efficiency	NA
Independent variable		
Country governance		
COC	Control of corruption	-
VA	Voice and accountability	+
Globalisation		
TrGI	Trade Globalisation	+
FiGI	Financial Globalisation	+
IpGI	Interpersonal Globalisation	-
InGI	Informational Globalisation	-
CuGI	Cultural Globalisation	-
Moderating variable		
EPU	The World Uncertainty Index	NA
Moderating effect		
CG* EPU	Country governance variables interact with economic policy uncertainty	+/-
Globalisation* EPU	Globalisation variables interact with economic policy uncertainty	+/-
Bank-level control variable		
size	ln(Total assets)	+/-
capital(Capitalisation)	Equity over total assets	+/-
quality (Credit risk)	Loan loss reserve over gross loan	+/-
Country-level control variable		
GDPG	GDP growth rate	+/-
CPI	Consumer price index	+/-
COVID	equals 1 if the years belong to the COVID-19 pandemic period (2020-2021)	+/-

3.5 Chapter Summary

This chapter outlined the resources and data gathering used in this study, along with the research technique used. A broad summary of the study methodology and the two stages of analysis were also provided in this section. The first stage employed the DEA model to generate bank efficiency score. In order to examine the impact of CG and globalisation on bank efficiency, as well as the moderating influence of EPU on these associations, the second step involved panel regression analysis based on OLS, FEM, and REM.

Additionally, to obtain more robust results, this study employed the IV-2SLS technique to examine the impact of CG and globalisation on bank efficiency.

The findings from these analytical methods are discussed in Chapter 4, where the results of the regression analyses are presented, followed by an in-depth discussion of how the empirical evidence aligns with or deviates from the theoretical expectations.

Table 3.3 provides a summary of Chapter Three.

Table 3.3 : Summary of Chapter Three

1. Data sources and selection		
1) Data about banks were obtained from BankFocus.		
2) Information about country-level control variables was obtained from the WDI database.		
3) Data about KOF Globalisation are available online at http://www.kof.ethz.ch/globalisation/ . Data about country governance were taken from the WGI dataset at www.govindicators.org . All data regarding EPU can be obtained from https://worlduncertaintyindex.com/data/ .		
Data were selected from three regions that represent the key emerging hubs of Islamic banking and finance from 2005 to 2021.		
The sample data covered 463 banks (110 IBs and 353 CBs) from 15 countries and to maintain homogeneity, this study excluded all finance companies, insurance companies, and investment banks.		
2. Methodology		
Stage of Analysis	First Stage	Second Stage
Estimation Method	Data Envelopment Analysis (DEA)	Panel Regression Analysis including OLS, FEM, REM.
		First Test
		Breush Pagan and Lagrangian Multiplier, Hausman Test
		Second Test
		IV-2SLS

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the empirical results of the study. First, the chapter shows the data on the DEA scores. Second, the DEA score, CG, globalisation, EPU, bank-level control variables, and country-level variables in the regression models are given. The impacts of CG and globalisation on the efficiency of both types of banks are examined. Subsequently, a more robust result of the research models under the panel regression using the IV-2SLS is presented. Next, the moderating impact of EPU on the impact of CG as well as globalisation on banks' efficiency are examined. Finally, this chapter summarises the results of the regression results.

4.2 Results of DEA

Following the suggestions put forward by Cooper et al. (2007), the precondition of running DEA is that the number of DMUs should be larger than three times the sum of the number of input and output variables as well as the product of the number of input and output variables. Since the number of input and output variable is 2, and the number of DMUs is 463, which is bigger than 12 (2×2 & $3 \times (2+2)$), this study meets the standard and the selection of variables is justifiable.

4.2.1 Efficiency of IBs vs. CBs for Individual Year

This section presents the different levels of efficiency between IBs and CBs categorised by year and region. The total number of banks, the mean value of efficiency, as well as the standard deviation are reported separately in Table 4.1. Generally, the average efficiency across all IB areas peaked in 2005 while the lowest was in 2021. Meanwhile, the average efficiency across all CB areas also peaked in 2005 while the lowest was in 2021. In ME, the average efficiency for IB areas peaked in 2005 while the lowest was in 2021. Meanwhile, the average efficiency for CBs peaked in 2005 with the lowest in 2021. In SA, the average efficiency for CBs peaked in 2009 while the lowest was in 2021. In SA, the average efficiency for IBs peaked in 2007, while the lowest was in 2021. In SEA, the average efficiency for CBs peaked in 2005, while the lowest was in 2021. In SEA, the average efficiency for IBs peaked in 2009, while the lowest was in 2021.

Table 4.1 : Panel Analysis on CBs and IBs' Efficiency

	CBs	No.	IBs	No.
2005				
ME	0.775	82	0.777	16
SA	0.810	24	0.919	2
SEA	0.804	53	0.783	2
All	0.790	159	0.792	20
2006				
ME	0.426	88	0.438	17
SA	0.462	30	0.767	2
SEA	0.399	56	0.463	3
All	0.423	174	0.471	22
2007				
ME	0.661	95	0.705	22
SA	0.738	33	0.941	3
SEA	0.707	64	0.827	4
All	0.690	192	0.747	29

Table 4.1 : Continued

	CBs	No.	IBs	No.
2008				
ME	0.666	99	0.647	26
SA	0.710	36	0.753	4
SEA	0.749	72	0.736	8
All	0.702	207	0.677	38
2009				
ME	0.762	110	0.705	33
SA	0.818	41	0.869	4
SEA	0.782	75	0.859	13
All	0.779	226	0.758	50
2010				
ME	0.490	118	0.455	45
SA	0.528	53	0.668	6
SEA	0.483	82	0.533	17
All	0.495	253	0.493	68
2011				
ME	0.644	128	0.542	50
SA	0.689	55	0.750	8
SEA	0.697	91	0.758	25
All	0.670	274	0.627	83
2012				
ME	0.684	132	0.609	55
SA	0.730	56	0.860	9
SEA	0.670	104	0.681	25
All	0.688	292	0.655	89
2013				
ME	0.405	136	0.402	57
SA	0.436	60	0.449	10
SEA	0.442	118	0.430	25
All	0.425	314	0.415	92
2014				
ME	0.347	140	0.210	60
SA	0.350	64	0.500	10
SEA	0.384	124	0.526	25
All	0.362	328	0.324	95
2015				
ME	0.302	142	0.246	63
SA	0.362	65	0.521	11
SEA	0.402	130	0.466	26
All	0.352	337	0.333	100
2016				
ME	0.464	144	0.416	69
SA	0.495	67	0.593	11

Table 4.1 : Continued

	CBs	No.	IBs	No.
SEA	0.501	130	0.544	26
All	0.484	341	0.465	106
2017				
ME	0.394	146	0.314	70
SA	0.409	66	0.480	11
SEA	0.443	132	0.500	26
All	0.416	344	0.376	107
2018				
ME	0.148	147	0.132	72
SA	0.229	67	0.441	11
SEA	0.204	134	0.327	27
All	0.185	348	0.211	110
2019				
ME	0.137	152	0.087	69
SA	0.164	67	0.262	11
SEA	0.149	134	0.261	27
All	0.146	353	0.149	107
2020				
ME	0.222	150	0.145	71
SA	0.252	67	0.360	11
SEA	0.300	134	0.372	27
All	0.257	351	0.223	109
2021				
ME	0.115	149	0.057	70
SA	0.137	68	0.220	11
SEA	0.114	133	0.214	27
All	0.119	350	0.113	108

4.2.2 Efficiency of IBs vs. CBs for Years 2005 to 2021

Table 4.2 shows the means of the IBs and CBs' efficiency, which were 0.43 vs. 0.39 for CBs and IBs, respectively. This indicated that CBs and IBs were not operating at full efficiency. This result shows that CBs generated more output compared to IBs due to the higher efficiency of CBs. In the ME region, the statistical means for efficiencies indicated that CBs were higher than IBs by 0.09. This shows that in the ME region, CBs produced larger outputs than

IBs when using the same volume of inputs. In other regions, IBs yielded higher efficiency compared to CBs, which indicated that IBs were more productive when facing the same input constraints. In conclusion, the results indicate that CBs were more efficient than IBs in most regions (ME and all regions).

Table 4.2 : Summary Mean of IBs and CBs' Efficiency for Years 2005 to 2021

Region	CBs	IBs
Middle East	0.421	0.333
South Asia	0.444	0.530
Southeast Asia	0.438	0.490
All	0.432	0.392

4.2.3 Summary on Level of Efficiency

All in all, CBs were found to be more efficient than IBs. CBs possessed extensive operating experience and knowledge, primarily relied on interest-based revenue, maintained substantial cash reserves, operated on a larger scale, and leveraged more advanced technology. As argued by Srairi (2010), CBs are also more efficient due to the scale of economy. Besides that, IBs are constrained by technology, indicating that these two types of banks did not have the same access to technology. IBs face higher costs of accessing technology brought by the rule of Shariah practitioners such as Shariah advisors as well as Shariah auditors, and individual product specificities such as the musharaka project (Abdul-Majid et al., 2017). Finally, the higher efficiency of CBs is attributed to the engagement of risky investments that is prohibited in IBs (Mobarek & Kalonov, 2014).

4.3 Preliminary Testing before Panel Regression Analysis

4.3.1 Descriptive Statistics of Research Variables

This analysis consisted of 6,176 observations in total (refer to Table 4.3). The mean efficiency of banks was 0.423, as shown in Table 4.3 below. The COC had an average value of -0.346 while VA had an average value of -0.575. Moreover, the size of bank had minimum and maximum values of 14.17 and 26.95. Capital had a maximum value of 46.09 and a minimum of 3.763. Quality had a minimum value of 0.093 and a maximum value of 22.48. Other control variables, comprising CPI, COVID and GDPG, had mean values of 141.9, 0.149 and 4.063 respectively.

Table 4.3 : Summary Statistics

variable	N	mean	sd	min	max
COC	6176	-0.346	0.724	-1.462	2.232
VA	6176	-0.575	0.516	-1.907	0.185
TrGI	6176	57.31	18.89	20.55	96.39
FiGI	6176	55.21	17.06	23.7	93.06
IpGI	6176	52.48	17.42	21.52	89.44
InGI	6176	69.34	11.72	28.03	89.89
CuGI	6176	55.71	16.95	21.58	87.73
EPU	6176	0.157	0.134	0	0.736
te	6176	0.423	0.286	0	1
size	6176	21.87	1.903	14.17	26.95
capital	6176	14.32	10.13	3.763	46.09
quality	6176	4.814	5.23	0.093	22.48
CPI	6176	141.9	95.68	49.41	1032
GDPG	6176	3.961	4.063	-21.4	26.17
COVID	6176	0.149	0.356	0	1

4.3.2 Correlation Matrix

Before addressing all objectives, this study first examined the degree of multicollinearity in the variables. According to Wooldridge (2002), multicollinearity is defined as the correlation among selected variables in the regression model. This happens when there is a linear relationship between the variables. It is considered a serious issue if the variable coefficient exceeds 0.8 (Gujarati & Porter, 2009; Kennedy, 2008). The VIF test is an additional supplemental technique for identifying multicollinearity. Following the test, multicollinearity occurs if the VIF value is greater than 10. If multicollinearity is discovered in a variable, it can be eliminated by changing the variable's functional form inside the equation or by applying different transformations (Wooldridge, 2002).

The correlation matrix of the variables is revealed in Table 4.4. As shown, most of the coefficients were below 0.8, indicating the absence of multicollinearity.

The result of VIF tests of each regression model is shown in regression table, where the max value of this test did not exceed 10, indicating that multicollinearity did not exist.

Table 4.4 : Correlation Matric

Variable	COC	VA	TrGI	FIGI	IpGI	lnGI	CuGI	EPU	te	size	capital	quality	CPI	GDPG	COVID
COC	1														
VA	-0.003	1													
TrGI	0.735***	0.063***	1												
FIGI	0.739***	0.149***	0.919***	1											
IpGI	0.729***	-0.262***	0.779***	0.715***	1										
lnGI	0.601***	-0.096***	0.658***	0.666***	0.807***	1									
CuGI	0.800***	0.204***	0.780***	0.804***	0.758***	0.782***	1								
EPU	-0.088***	0.016	0.072***	0.065***	0.078***	0.210***	0.062***	1							
te	-0.008	0.146***	0.087***	0.053***	-0.039***	-0.291***	-0.048***	-0.049***	1						
size	0.370***	-0.242***	0.272***	0.285***	0.435***	0.375***	0.348***	0.063***	-0.298***	1					
capital	-0.067***	-0.013	0.026**	-0.072***	-0.140***	-0.087***	-0.122***	-0.049***	0.083***	-0.509***	1				
quality	-0.185***	-0.202***	-0.069***	-0.116***	-0.086***	-0.069***	-0.248***	0.031**	-0.021*	-0.164***	0.153***	1			
CPI	-0.229***	-0.270***	-0.321***	-0.291***	-0.062***	0.160***	-0.152***	0.176***	-0.359***	0.115***	-0.102***	0.062***	1		
GDPG	0.041***	0.124***	-0.072***	-0.128***	-0.104***	-0.287***	-0.064***	-0.086***	0.204***	-0.078***	-0.031**	-0.155***	-0.160***	1	
COVID	-0.032**	-0.054***	-0.093***	-0.044***	-0.053***	0.178***	0.008	0.051***	-0.351***	0.041***	0.030**	0.098***	0.379***	-0.353***	1

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.4 Results and Tests of Panel Regression Analysis

4.4.1 The Impact of Control Variables on IBs and CBs

After computing the DEA score, the link between the bank-level and country-level factors was established with the main independent variable to the efficiency score. To examine this relationship, the MRPA technique was employed. The results of the second-stage analysis for IBs and CBs in all regions are presented in Tables 4.5 and 4.6, respectively.

As indicated by the BP LM and Hausman tests of Model 1 and 2 presented in Tables 4.5 and 4.6, combined with the decision rules outlined in Section 3.3.2.1.1 (Panel Regression Analysis), FEM regression analysis was determined to be the final outcome for Model 1 and 2.

As shown in Model 1 and 2, the coefficient of size was negatively correlated with the efficiency of both types of banks. The negative parameter implies the larger the bank size, the lower efficiency of the bank. Large banks with more clout in the market perform worse than smaller banks since they do not aim to collect all possible rent (Koetter et al., 2012). Managers of banks are highly motivated to maximise profits in markets that are competitive. However, in an oligopolistic market, powerful executives are generally more interested in enjoying the “quiet life” than in maximising profits. Besides that, small banks have access to more information for assessing and keeping track of loan quality. The senior management is typically closer to commercial loan customers due to a flatter management structure, which allows for more

accurate assessments (McNulty et al., 2001; Tan, 2016). This closeness can lessen issues with asymmetric information.

In addition, more effort needs to be made to deal with diverse business, suggesting that bigger does not mean better (De Young, 1995). Bigger sized banks may encounter challenges in effectively monitoring diverse profit-loss arrangements, managing issues stemming from information asymmetry, and adapting their credit risk monitoring systems, which make them less efficient (Douplos et al., 2017). A similar conclusion is documented in the context of Hong Kong (Kwan, 2006), Ukraine (Mertens & Urga, 2001), Thailand (Chansarn, 2008), transition countries (Djalilov & Piesse, 2016), Japan (Drake & Hall, 2003), GCC countries (Srairi, 2010), Vietnam (Le et al., 2020), and China (Ariff & Can, 2008; Tan, 2016). Regarding the larger coefficient for CBs, this may be because CBs have larger assets in the sample countries compared to IBs, which exposes them to more challenges stemming from their diverse business operations.

Credit risk had a negative and statistically significant impact on the efficiency of both CBs and IBs. This indicates that as a bank's credit risk increases, its efficiency declines. The negative sign of credit risk can be explained by the bad luck hypothesis and bad management hypothesis (Berger & DeYoung, 1997). Exogenous shocks have the potential to increase the number of nonperforming loans, and the extra expenses associated with overseeing and managing these loans reduce their efficiency (Berger & DeYoung, 1997). Therefore, the banks may have to spend more on monitoring and provisioning

as a result of an increase in credit risk, which would raise their operating costs that may cause additional declines in efficiency (Zaman & Bhandari, 2022). A similar negative conclusion have also been drawn for banks in Japan (Fukuyama & Matousek, 2017), Brazil (Takahashi & Vasconcelos, 2024), India (Zaman & Bhandari, 2022), and the US (Phung et al., 2022). The parameter of IB was larger than CBs regarding the impact of credit risk. CBs benefit from greater flexibility in risk management strategies (Hasan & Dridi, 2010), enabling them to manage and absorb credit risk more effectively. Because of this, credit risk has a less negative effect on their efficiency than it does on IBs.

Concerning the impact of capitalisation on bank efficiency, it can be observed from Tables 4.5 and 4.6 that for CBs and IBs, the coefficient of capitalisation had a negative value. The negative findings suggest that banks with comparatively greater (lower) capitalisation levels typically report lower (higher) levels of efficiency. A bank with high equity may be less inclined to take on risk, which could lead them to reject a project with a high net present value (NPV) but low risk (Khan et al., 2020). Besides that, managers may have more money to invest due to increased equity capital and lesser debt pressure, which can result in wasteful spending and decreased efficiency (Do Van Anh, 2022). Equity participation and risk-sharing are encouraged in banks; hence banks may have a larger percentage of equity in their capital structure. While equity capital offers stability and lower risk, it can also be more expensive than borrowing from outside (Adjei-Frimpong et al., 2014). Based on the Miller Modigliani theory, proper debt financing will contribute to the entire performance of a company (Brusov et al., 2018). An optimal capital structure

should be based on bankruptcy costs as well as taxes. A similar negative conclusion is also drawn for banks in Ghana (Adjei-Frimpong et al., 2014), Malaysia (Sufian, 2009), Latin American (Tabak et al., 2011), and Brazil (Takahashi & Vasconcelos, 2024). However, the parameter of CBs was larger than that of IB. Due to its more complicated capital structure, CBs may depend more on equity financing than debt financing as capitalisation levels rise. This could result in higher capital costs and a decrease in the bank's efficiency.

In terms of GDP growth, its impact was positive for IBs but not statistically significant for CBs. GDP growth had a positive and significant association with IBs. To explain this result, banks often take in more deposits and generate higher cash flows (Srairi, 2010). A positive trend in GDP typically signifies a well-functioning economy, marked by increased investment, expenditure, and production. As a result, investment opportunities grow, the default rate among loan applicants declines, and banks benefit from higher-quality assets and larger asset volumes. Some studies hold a positive view on the GDPG-efficiency nexus (Barth et al., 2013b; Chen & Lu, 2021; Kamarudin et al., 2022). For the insignificant impact of GDP growth on CBs, this may be because CBs may use a wider variety of financial services and products and are therefore less susceptible to changes in GDP growth.

With regards to the relationship between CPI and efficiency, the regression results indicated that a higher CPI level was associated with lower efficiency. The coefficients were also found to be statistically significant. To explain this, the management of banks can predict and adjust the bank's operations in

response to inflation. The profitability of the bank will then be influenced by the interest rates modified by the bank management when actual inflation aligns with or falls below expectations (Tan et al., 2017). However, when actual inflation surpasses predicted inflation, bank managers may face difficulties. In certain situations, bank managers' adjustments to interest rates based on anticipated inflation may not be sufficient, which would lower bank profitability. Besides that, a high CPI directly affects macroeconomic and financial instability, which would decrease bank efficiency (Le et al., 2022). Additionally, increased inflation tends to reduce efficiency because risk-averse people would shorten their contracts to minimise losses from actual inflation deviating from expectations (Umar et al., 2014). Banks can also operate more efficiently in a climate with less inflation (Barth, Lin, et al., 2013). A similar conclusion is drawn in the contexts of India (Maji & Saha, 2023) and Vietnam (Le et al., 2022). The coefficient of CB was larger than that of IB. Adjustments to interest rates are a key instrument used by CBs to control the effects of inflation on efficiency. When inflation exceeds expectations, CB managers may struggle to align their interest rates with actual inflation, leading to lower profitability and efficiency. However, due to the profit-sharing model, IBs are less dependent on changes in interest rates.

Additionally, the observed negative value of the COVID shows that the efficiency of both kinds of banks is negatively correlated. The negative association indicate the COVID lower the efficiency. A number of economic areas, including financial markets, sports, tourism, and exports, were influenced by COVID (Arafat et al., 2021). Profits also declined due to COVID

as the number of confirmed cases increased, significantly impacting economic activities (Yudaruiddin, 2023). A similar negative relationship was observed in the contexts of Indonesia (Yudaruiddin, 2023) and GCC Region, Malaysia, and Pakistan (Arafat et al., 2021). Regarding the larger coefficient for IBs, this may be because CBs often utilise advanced risk-reduction strategies, such as derivatives, which do not adhere to Shariah law. As a result, Islamic institutions may be less equipped to manage the financial risks associated with COVID.



Table 4.5 : Regression Results of CG on CBs: All Regions

Variable	Model1			Model2			Model3			Model4		
	ols	Fe	re	ols	fe	re	ols	fe	re	ols	fe	re
COC							0.014** (0.01)	-0.082*** (0.02)	0.014** (0.01)			
VA										-0.018** (0.01)	0.082*** (0.03)	-0.022** (0.01)
size	-0.049*** (0.00)	-0.267*** (0.01)	-0.067*** (0.00)	-0.047*** (0.00)	-0.194*** (0.01)	-0.052*** (0.00)	-0.050*** (0.00)	-0.187*** (0.01)	-0.053*** (0.00)	-0.048*** (0.00)	-0.195*** (0.01)	-0.053*** (0.00)
capital	-0.003*** (0.00)	-0.008*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.007*** (0.00)	-0.003*** (0.00)
quality	-0.003*** (0.00)	-0.008*** (0.00)	-0.004*** (0.00)	0.001 (0.00)	-0.002* (0.00)	0.000 (0.00)	0.001 (0.00)	-0.002* (0.00)	0.001 (0.00)	0.000 (0.00)	-0.002** (0.00)	-0.000 (0.00)
CPI				-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
GDPG				0.003*** (0.00)	0.000 (0.00)	0.003*** (0.00)	0.003*** (0.00)	0.001 (0.00)	0.003*** (0.00)	0.003*** (0.00)	0.001 (0.00)	0.003*** (0.00)
COVID				-0.153*** (0.01)	-0.085*** (0.01)	-0.145*** (0.01)	-0.155*** (0.01)	-0.085*** (0.01)	-0.148*** (0.01)	-0.151*** (0.01)	-0.083*** (0.01)	-0.144*** (0.01)
cons	1.552*** (0.06)	6.425*** (0.17)	1.962*** (0.08)	1.683*** (0.05)	4.965*** (0.17)	1.796*** (0.06)	1.741*** (0.06)	4.773*** (0.18)	1.837*** (0.07)	1.714*** (0.05)	5.031*** (0.17)	1.833*** (0.06)
N	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843
r2	0.083	0.230		0.269	0.336		0.270	0.337		0.270	0.337	
r2 a	0.082	0.168		0.268	0.282		0.269	0.283		0.269	0.283	
F/ VIF	145.041***	445.536***	1.24	297.143***	377.087***	1.29	255.814***	325.715***	1.36	255.654***	325.470***	1.31
BP LM	chibar2(01) =16.97***			chibar2(01) = 32.49***			chibar2(01) = 30.36***			chibar2(01) = 33.45***		
chi2		445.579***				1784.703***			1789.180***			1792.293***
Hausman		chi2(3) = 758.33***			chi2(6) = 489.68***			chi2(7) =518.39***			chi2(7) = 493.81***	

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.6 : Regression Results of CG on IBs: All Regions

Variable	Model1			Model2			Model3			Model4		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
COC							0.032 ^{***} (0.01)	-0.048 (0.04)	0.035 ^{**} (0.02)			
VA										0.010 (0.01)	-0.024 (0.05)	-0.006 (0.02)
size	-0.066 ^{***} (0.00)	-0.219 ^{***} (0.01)	-0.092 ^{***} (0.01)	-0.051 ^{***} (0.00)	-0.145 ^{***} (0.02)	-0.057 ^{***} (0.01)	-0.056 ^{***} (0.00)	-0.145 ^{***} (0.02)	-0.062 ^{***} (0.01)	-0.050 ^{***} (0.00)	-0.145 ^{***} (0.02)	-0.058 ^{***} (0.01)
capital	-0.002 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{**} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{**} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{**} (0.00)	-0.003 ^{***} (0.00)
quality	-0.006 ^{***} (0.00)	-0.011 ^{***} (0.00)	-0.008 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{**} (0.00)	-0.003 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{**} (0.00)	-0.003 ^{**} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{**} (0.00)
CPI				-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)
GDPG				0.007 ^{***} (0.00)	0.006 ^{***} (0.00)	0.007 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.007 ^{***} (0.00)
COVID				-0.152 ^{***} (0.02)	-0.100 ^{***} (0.02)	-0.141 ^{***} (0.02)	-0.161 ^{***} (0.02)	-0.098 ^{***} (0.02)	-0.146 ^{***} (0.02)	-0.155 ^{***} (0.02)	-0.101 ^{***} (0.02)	-0.140 ^{***} (0.02)
cons	1.892 ^{***} (0.10)	5.308 ^{***} (0.31)	2.479 ^{***} (0.17)	1.636 ^{***} (0.10)	3.698 ^{***} (0.34)	1.776 ^{***} (0.14)	1.743 ^{***} (0.10)	3.690 ^{***} (0.34)	1.880 ^{***} (0.15)	1.617 ^{***} (0.10)	3.672 ^{***} (0.35)	1.784 ^{***} (0.15)
N	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333
r2	0.167	0.185		0.304	0.248		0.308	0.249		0.304	0.248	
r2 a	0.165	0.108		0.301	0.175		0.304	0.175		0.300	0.174	
F/VIF	88.701 ^{***}	91.848 ^{***}	1.31	96.382 ^{***}	66.676 ^{***}	1.29	84.109 ^{***}	57.349 ^{***}	1.43	82.646 ^{***}	57.141 ^{***}	1.39
BP LM	chibar2(01) = 153.49 ^{***}			chibar2(01) = 131.68 ^{***}			chibar2(01) = 126.99 ^{***}			chibar2(01) = 129.51 ^{***}		
chi2			181.703 ^{***}			453.868 ^{***}			461.717 ^{***}			453.700 ^{***}
Hausman			chi2(3) = 112.95 ^{***}			chi2(6) = 49.00 ^{***}			chi2(7) = 49.56 ^{***}			chi2(7) = 50.27 ^{***}

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.4.2 Does CG Matter for Banks' Efficiency?

FEM regression analysis was found to be the ultimate result for Models 3 and 4 in Tables 4.5 and 4.6, as supported by the outcomes of the BP LM and Hausman tests in Tables 4.5 and 4.6, as well as the choice guidelines described in Section 3.3.2.1.1 (Panel Regression Analysis). According to FEM, COC was negatively correlated with banks' efficiency whereas VA was positively correlated with banks' efficiency. However, the coefficient was significant for CBs and insignificant for IBs.

The negative impact of COC could be explained by the Grease the Wheels theory (Méon & Weill, 2010). Corruption can counteract poor bureaucratic functioning and help officers to make optimal decisions. Corruption occurs in scenarios where politicians act as agents and the public is viewed as the principal. Corruption also arises when agents seek personal benefits (Shleifer & Vishny, 1993). The allowance of corruption expedites the allocation procedure (Lui, 1985). This means that resources can start to flow towards more profitable endeavours as a result of corruption, rather than being allocated in accordance with efficiency or equity standards. This could enhance efficiency because entities such as banks may engage in bribery to obtain additional capital, which can then be utilised for more prosperous commercial endeavours. Besides that, corruption has been found to be positively correlated with growth, as documented in studies focusing on Indonesia (Vial & Hanoteau, 2010) and China (Li & Wu, 2007). As economies grow, there is usually a corresponding increase in the demand for financial

services, leading to higher loan quality and quantity (Garza-García, 2012). This, in turn, can enhance the efficiency of banks.

In addition, agents that seek illegal benefits can be considered as rent-seeking. According to Tullock (1967), when the benefit of a behaviour is over the cost of the behaviour, the overall result is positive for economic activities. Banks have some expenses when they approach politicians for help, but there are advantages as well. For example, corruption makes it possible for investors to get around the law and more readily achieve their own goals (Alshubiri et al., 2023) and overcome delay (Haschka et al., 2023). Corruption is frequently used as a solution to problems caused by the failure of government regulatory authorities (Alshubiri et al., 2023). Bank efficiency will increase if the benefits surpass the expenses.

Finally, a higher COC value indicates a strong supervisory agency and a high level of restrictions. Excessive authority can benefit loyal supporters, draw funding for campaigns, and encourage corruption (Barth et al., 2013). Restrictions also make it harder for banks to handle client information and offer efficient services to customers, which in turn restricts their operations and eventually lowers bank efficiency (Kamarudin et al., 2022). The negative relationship has also been documented in SEA countries (Kamarudin et al., 2022) and Tunisia (Bougatef, 2017).

The insignificance of the impact of COC on IBs can be attributed to their operation under Shariah principles, which emphasise ethical behaviour,

transparency, and fairness. Compared to CBs, the impact of external corruption control measures may be lessened because these principles naturally prohibit corrupt actions in IBs (Ghafran & Yasmin, 2020). These robust internal Shariah governance mechanisms act as an effective safeguard, diminishing the reliance on external corruption control to maintain business continuity.

VA represents a nation's citizens' freedom of expression, freedom of association, freedom of the press, and choice of government (Uddin et al., 2020). The positive impact of VA can be explained by Theory of Principal-Agent theory. Election and voting power can mitigate the absence of principals from day-to-day activities and curb rent-seeking practices. Besides that, an effective accountability system can reduce misconduct and negligence related to duties, while strengthening administrative order. This approach promotes positive expectations for stabilising the economic system and expedites the recovery of economic and social order (Liu et al., 2024), which would increase the investments from firms. Besides that, banks are unable to discern between enterprises' quality and shocks in an environment that lacks transparency (Mehrez & Kaufmann, 2000). Under these conditions, banks could offer more credit than the normal period and overestimate returns. These result in a less efficient bank. Finally, companies with higher levels of transparency tend to be better managed, as transparency is linked to more dependable information exchange between a company's internal operations and its investors (Akhigbe et al., 2013).

A higher VA index can create accountability and credibility of governance. A well-functioning voice system can effectively reduce information asymmetry, create open information channels, stabilise market sentiment, and reduce panic (Liu et al., 2024), which will increase the demand for banking services. Apart from that, increased information accessibility through media independence brought by VA can lower bank costs and improve bank industry performance as a whole (Uddin et al., 2020). The positive impact of VA has also been documented in the GCC region (Kamarudin et al., 2018).

The insignificant coefficient for IBs may stem from their prioritisation of financial stability and adherence to religious principles over broader political participation. The broader influence of VA is likely overshadowed by IBs' focus on fostering stakeholder relationships through profit-sharing and ethical finance.

4.4.3 Does Globalisation Matter for Banks' Efficiency?

The results of the BP LM and Hausman tests in Tables 4.7 and 4.8, along with the selection criteria outlined in Section 3.3.2.1.1 (Panel Regression Analysis) confirmed that FEM regression analysis was the final outcome for Models 1 through 5 in Tables 4.7 and 4.8.

FEM in Tables 4.7 and 4.8 indicate that trade globalisation and financial globalisation was positively correlated with both types of banks' efficiency. However, the impact of financial globalisation on IBs' efficiency was not

significant. Interpersonal globalisation, informational globalisation, and cultural globalisation decreased both types of banks' efficiency.

Trade globalisation was found to be positively correlated with two types of banks' efficiency. This can be explained by Theory of Trade. According to this theory, high trade globalisation drives higher demand for banking services, fuelled by the expansion of international trade and economic growth. Increased international trade also leads to an expansion of banking operations, thereby enhancing bank efficiency (Zhang & Daly, 2014). Trade globalisation enhances the range and quality of financial services and goods that are offered on the market (Tamirisa et al., 2000). As trade between countries grows, there is a greater need for trade finance services such as letters of credit, trade loans, and currency exchange. Banks can boost their efficiency by attracting more business from traders by providing dependable and efficient trade finance services. Increased risk diversification for banks can also result from trade liberalisation (Ashraf, 2018). Banks with a diversified portfolio may be more resistant to market fluctuations than those in a single market, which can improve overall efficiency. Besides that, trade liberalisation has a favourable impact on a country's growth (Erkisi & Ceyhan, 2019; Manni & Afzal, 2012), income, and poverty-reduction (Winters & Martuscelli, 2014). Economic growth, and an increased customer base resulting from poverty reduction, leads to higher demand for banking services, allowing banks to benefit from economies of scale. A similar conclusion has been drawn for Malaysia (Sufian & Habibullah, 2014) and Vietnam (Nguyen & Nguyen, 2018). The larger parameter for IBs may be attributed to their focus on Shariah-

compliant trade finance instruments (HAQUE, 2016; Zubair, 2022). Instruments such as Murabaha (cost-plus financing) and Salam (forward contracts) are especially prevalent in international trade.

Financial globalisation was found to be positively correlated with CBs' efficiency. The positive sign revealed that higher financial globalisation in a country leads to higher efficiency of CBs. This can be explained by the Financial Development Theory. According to this theory, financial globalisation leads to greater access to external capital, advanced knowledge, and intensified competition. Gaies and Jahmane (2022) suggest that banks should have more access to external capital markets as a result of higher levels of financial globalisation. Deeper integration into the global market increases banks' savings, financial resources, and customer base (Gaies & Jahmane, 2022). Consequently, banks can benefit from economies of scale, leading to cost reductions. Foreign banks can improve domestic efficiency through their infusion of sophisticated operational principles and management knowledge (Sufian & Habibullah, 2012). Besides, financial globalisation exposes banks to greater competition from both domestic and international financial institutions (Akdoğan, 2018; Zhang & Daly, 2014).

In order to stand out in a highly competitive environment, banks may develop novel products that are more effective, or which better fit the demands of their clients. Furthermore, heightened competition may prompt banks to look for methods to cut down on costs. This can entail simplifying their organisational structure, automating jobs with technology, or putting more effective

procedures in place. Finally, competition may force banks to concentrate more on offering top-notch customer service, which may boost productivity by lowering the need for rework or handling client complaints. The insignificant parameter for IBs may be due to differences in their operating scope. IBs primarily operate under Shariah-compliant principles, which restrict the types of financial instruments they can utilise. The need for Shariah-compliant funding sources may limit IBs' ability to access external capital to the same extent as CBs, which have full access to global capital markets.

Interpersonal globalisation has a negative impact on the efficiency of both types of banks. This can be explained by the Social Friction Theory. This theory holds that communication costs rise as a result of interpersonal friction increasing as a result of globalisation. Nguyen and Nguyen (2018) contend that interpersonal globalisation promotes an increase in the proportion of foreigners working in banks operating in one country. Banks have more managers from overseas, and foreign banks have also entered the local market, employing many locals in foreign banks. The clash of ideas between foreign and the local banks has led to high friction costs, thereby reducing the efficiency of banks. Hussain et al. (2021) also contend that every country has distinct behaviours, inconsistencies and differences in interpersonal relationships between the home and host countries among the senior management, which may pose difficulties for firms. In addition, insufficient tolerance may make things worse. Local managers may come into conflicts with foreign managers, thereby affecting efficiency. A similar negative sign of interpersonal globalisation has also been documented in Asia (Hussain et al.,

2021). Given the greater impact of interpersonal globalisation on IBs, this could be attributed to their ethical and religious foundations. If foreign entrants fail to fully understand these principles, IB operations may be more severely affected by disputes or misalignments over business practices or decision-making.

A negative sign was observed in the relationship between informational globalisation and the efficiency of both types of banks. The negative nexus can be explained by Theory of Information Security. This theory states that information exchange raises data hazards, endangering banking operations. This calls for banks to make ongoing investments in data security, frequently with little apparent impact. Informational globalisation refers to the spread of information and ideas globally. The banking industry has undergone significant transformation in management practices and customer interactions due to the development of ICT. Banks have to manage massive amounts of consumer data due to the adoption of ICT, which raises questions regarding data privacy and regulatory compliance. Wide-ranging data exchanges are involved in the spread of ICT. This heightens worries about data security in the financial industry (Boer & Vazquez, 2017). Banks may have ongoing costs to deal with hackers to meet the growing worries about data security (Uddin et al., 2020). Besides, Luo et al. (2023) contended that competition between banks could increase as they strive to provide advanced services and enhance customer satisfaction. As a result of increased competition, banks may find it difficult to sustain their previous cost levels. A similar conclusion was also drawn by Luo et al. (2023). The larger coefficient for IBs may stem from the complexity of

their IT-related operations. The development of the information system for Islamic financial institutions will require consideration of Shariah requirements (Ayedh et al., 2021). The difficulties relating to data security and regulatory compliance may be made worse by these extra obligations.

Finally, cultural globalisation had a negative and significant relationship with both types of banks' efficiency. This can be explained by the Social Friction Theory. According to this theory, cultural differences can exacerbate suspicion and lead to friction between local and international entities. Cultural globalisation measures the diffusion of cultures and social norms. Misunderstandings and inefficiencies in teamwork and decision-making processes can result from cultural differences in customs and communication styles among personnel (Hussain et al., 2021). Cultural differences in moral norms and behaviours can make it difficult to uphold integrity and compliance, which could result in legal problems that could hinder efficiency. For example, Xu et al. (2024) argue that local entities may become more suspicious of foreign entities due to cultural differences that result in cognitive legitimacy gaps. Efficiency is weakened as a result of this mistrust, which compels organisations to use particular strategies to overcome it. Nguyen and Nguyen (2018) also contend that the development strategy may be affected because people from different cultures may hold different views on marketing, credit growth policies, and risk management policies, and these differences may be reflected in practice. Nguyen and Nguyen (2018) and Hussain et al. (2021) also reported a negative relationship between cultural globalisation and efficiency. In terms of the larger influence of cultural globalisation on IB, this

may contribute to Shariah-compliant frameworks. IBs operate under religious and ethical guidelines that may not align with the western cultural norms, which may exacerbate friction and reduce efficiency.



Table 4.7 : Regression Results of Globalisation on CBs: All Regions

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	Re	ols	fe	re	ols	fe	re
TrGI	0.002*** (0.00)	0.010*** (0.00)	0.002*** (0.00)												
FIGI				0.001*** (0.00)	0.002** (0.00)	0.001*** (0.00)									
IpGI							0.001*** (0.00)	-0.003** (0.00)	0.001*** (0.00)						
InGI										-0.003*** (0.00)	-0.015*** (0.00)	-0.004*** (0.00)			
CuGI													0.000 (0.00)	-0.008*** (0.00)	0.000 (0.00)
size	-0.054*** (0.00)	-0.169*** (0.01)	-0.060*** (0.00)	-0.051*** (0.00)	-0.192*** (0.01)	-0.055*** (0.00)	-0.052*** (0.00)	-0.189*** (0.01)	-0.057*** (0.00)	-0.040*** (0.00)	-0.097*** (0.01)	-0.041*** (0.00)	-0.048*** (0.00)	-0.174*** (0.01)	-0.051*** (0.00)
capital	-0.003*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.003*** (0.00)	-0.005*** (0.00)	-0.003*** (0.00)
quality	0.001 (0.00)	-0.003*** (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002** (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002** (0.00)	0.001 (0.00)	-0.000 (0.00)	-0.003** (0.00)	-0.001 (0.00)	0.001 (0.00)	-0.004*** (0.00)	0.001 (0.00)
CPI	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
GDPG	0.004*** (0.00)	-0.001 (0.00)	0.004*** (0.00)	0.004*** (0.00)	0.001 (0.00)	0.004*** (0.00)	0.003*** (0.00)	0.001 (0.00)	0.003*** (0.00)	0.001 (0.00)	-0.002** (0.00)	0.000 (0.00)	0.003*** (0.00)	-0.001 (0.00)	0.003*** (0.00)
COVID	-0.144*** (0.01)	-0.058*** (0.01)	-0.136*** (0.01)	-0.150*** (0.01)	-0.086*** (0.01)	-0.144*** (0.01)	-0.146*** (0.01)	-0.094*** (0.01)	-0.140*** (0.01)	-0.153*** (0.01)	-0.084*** (0.01)	-0.143*** (0.01)	-0.153*** (0.01)	-0.097*** (0.01)	-0.146*** (0.01)
cons	1.728*** (0.05)	3.810*** (0.20)	1.841*** (0.06)	1.680*** (0.05)	4.813*** (0.18)	1.776*** (0.06)	1.738*** (0.05)	4.983*** (0.17)	1.836*** (0.06)	1.706*** (0.05)	3.753*** (0.17)	1.840*** (0.06)	1.687*** (0.05)	4.968*** (0.16)	1.788*** (0.06)
N	4843 (0.278)	4843 (0.352)	4843 (0.278)	4843 (0.273)	4843 (0.336)	4843 (0.282)	4843 (0.274)	4843 (0.336)	4843 (0.282)	4843 (0.279)	4843 (0.390)	4843 (0.340)	4843 (0.270)	4843 (0.349)	4843 (0.296)
r ² a	0.277	0.299		0.272	0.282		0.273	0.282		0.278	0.340		0.268	0.296	
F/VIF	266.472***	347.317***	1.36	259.711***	324.139***	1.34	260.118***	324.021***	1.34	267.171***	408.451***	1.36	254.889***	342.609***	1.34
BP LM		chibar2(01) = 40.29***			chibar2(01) = 32.39***			chibar2(01) = 26.51***			chibar2(01) = 97.81***			chibar2(01) = 29.81***	
chi2															
Hausman		chi2(7) = 546.91***			chi2(7) = 489.86***			chi2(7) = 496.66***			chi2(7) = 730.15***			chi2(7) = 589.54***	

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.8 : Regression Results of Globalisation on IBs: All Regions

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	0.001 ^{***} (0.00)	0.012 ^{***} (0.00)	0.002 ^{***} (0.00)												
FIGI				0.001 ^{***} (0.00)	0.002 (0.00)	0.002 ^{**} (0.00)									
IpGI							0.002 ^{***} (0.00)	-0.012 ^{***} (0.00)	0.002 ^{***} (0.00)						
lnGI										-0.002 ^{***} (0.00)	-0.018 ^{***} (0.00)	-0.007 ^{***} (0.00)			
CuGI													0.001 ^{***} (0.00)	-0.019 ^{***} (0.00)	0.001 (0.00)
size	-0.055 ^{***} (0.00)	-0.148 ^{***} (0.02)	-0.061 ^{***} (0.01)	-0.055 ^{***} (0.00)	-0.146 ^{***} (0.02)	-0.061 ^{***} (0.01)	-0.062 ^{***} (0.00)	-0.146 ^{***} (0.02)	-0.066 ^{***} (0.01)	-0.047 ^{***} (0.00)	-0.113 ^{***} (0.01)	-0.043 ^{***} (0.01)	-0.055 ^{***} (0.00)	-0.146 ^{***} (0.01)	-0.059 ^{***} (0.01)
capital	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)
quality	-0.003 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.009 ^{***} (0.00)	-0.004 ^{***} (0.00)
CPI	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	0.000 (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)
GDPG	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	0.005 ^{***} (0.00)	0.006 ^{***} (0.00)	0.006 ^{***} (0.00)	-0.001 ^{***} (0.00)	0.005 ^{***} (0.00)	0.006 ^{***} (0.00)	0.003 ^{***} (0.00)	0.007 ^{***} (0.00)
COVID	-0.165 ^{***} (0.02)	-0.052 ^{***} (0.02)	-0.146 ^{***} (0.02)	-0.166 ^{***} (0.02)	-0.103 ^{***} (0.02)	-0.149 ^{***} (0.02)	-0.154 ^{***} (0.02)	-0.139 ^{***} (0.02)	-0.138 ^{***} (0.02)	-0.144 ^{***} (0.02)	-0.109 ^{***} (0.02)	-0.128 ^{***} (0.02)	-0.163 ^{***} (0.02)	-0.100 ^{***} (0.02)	-0.143 ^{***} (0.02)
cons	1.659 ^{***} (0.10)	3.148 ^{***} (0.35)	1.775 ^{***} (0.14)	1.648 ^{***} (0.10)	3.609 ^{***} (0.35)	1.768 ^{***} (0.14)	1.735 ^{***} (0.10)	4.439 ^{***} (0.37)	1.828 ^{***} (0.14)	1.671 ^{***} (0.10)	4.197 ^{***} (0.32)	1.934 ^{***} (0.15)	1.649 ^{***} (0.10)	4.783 ^{***} (0.35)	1.775 ^{***} (0.14)
N	1333 (0.10)	1333 (0.35)	1333 (0.14)	1333 (0.10)	1333 (0.35)	1333 (0.14)	1333 (0.10)	1333 (0.37)	1333 (0.14)	1333 (0.10)	1333 (0.32)	1333 (0.15)	1333 (0.10)	1333 (0.35)	1333 (0.14)
r2	0.310 (0.10)	0.266 (0.35)		0.309 (0.10)	0.249 (0.35)		0.317 (0.10)	0.262 (0.37)		0.307 (0.10)	0.358 (0.32)		0.308 (0.10)	0.292 (0.35)	
r2 a	0.306 (0.10)	0.194 (0.35)		0.306 (0.10)	0.175 (0.35)		0.314 (0.10)	0.189 (0.37)		0.304 (0.10)	0.295 (0.32)		0.305 (0.10)	0.223 (0.35)	
FMI/F	85.040 ^{***} (0.10)	62.831 ^{***} (0.35)	1.41 (0.14)	84.833 ^{***} (0.10)	57.325 ^{***} (0.35)	1.41 (0.14)	88.030 ^{***} (0.10)	61.434 ^{***} (0.37)	1.42 (0.14)	83.969 ^{***} (0.10)	96.480 ^{***} (0.32)	1.34 (0.15)	84.434 ^{***} (0.10)	71.547 ^{***} (0.35)	1.38 (0.14)
BPLM	chibar2(01) = 125.77 ^{***}			chibar2(01) = 122.32 ^{***}			chibar2(01) = 102.86 ^{***}			chibar2(01) = 168.68 ^{***}			chibar2(01) = 113.60 ^{***}		
chi2	468.754 ^{***}			465.577 ^{***}			477.792 ^{***}			520.572 ^{***}			456.422 ^{***}		
Hausman	chi2(7) = 76.04 ^{***}			chi2(7) = 49.46 ^{***}			chi2(7) = 75.70 ^{***}			chi2(7) = 181.71 ^{***}			chi2(7) = 126.16 ^{***}		

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.4.4 Controlling for Potential Endogeneity

Overall, the initial findings show that the efficiency of CBs has been significantly impacted by COC, VA and all aspects of globalisation. Furthermore, trade Globalisation, informational Globalisation, interpersonal Globalisation, and cultural Globalisation are all significantly correlated with the efficiency of IBs. To get reliable results, this study performs the IV-2SLS estimation approach.

4.4.4.1 IV-2SLS Outcomes for CG-Bank efficiency

According to Model 1 and 2 in Table 4.9 and 4.10, the null hypothesis is rejected when the Anderson canonical correlations likelihood ratio (LM) test shows a p-value less than 0.05, indicating that there is no problem with underidentification. Furthermore, the null hypothesis of weak instruments should be rejected since the Cragg-Donald Wald F statistic exceeds the threshold values (16.38). Both of above indicate that IV met the correlation assumption. As a result, the IV-2SLS estimate method was determined as suitable.

The second stage in Model 1 as depicted in Table 4.9, determined that the impact of COC remained negative for CBs and that the impact was significant.

Model 1 in Table 4.10 shows that for IBs, COC became negative and that the impact was significant at 1% level. IBs are governed by a dual governance system, which includes regulatory frameworks and Shariah-compliance boards (Fatmawati et al., 2022). Similar to CBs, regulatory frameworks in IBs are subject to the same influences, supporting the Grease the Wheels theory.

However, the lower coefficient for IBs suggests that due to the institutional and religious norms that govern their operations, they are less prone to engage in corrupt practices.

Regarding the impact of VA, second stage outcomes in model 2 in Table 4.9, and Table 4.10 indicate that the impact of VA is not significant for both types of banks. VA may not be as important to the immediate efficiency improvement of both kinds of banks since they may place more emphasis on internal governance frameworks like risk management and regulatory compliance than on broader political involvement.

Table 4.9 : IV Estimations CB for Country Governance

Variable	Model 1		Model 2	
	First	Second	First	Second
COC		-0.286*** (0.04)		
L.COC	0.657*** (0.01)			
VA				-0.028 (0.04)
L.VA			0.785*** (0.00)	
Anderson canon. corr. LM statistic	2012.48 [0.0000]		2730.65 [0.0000]	
Cragg-Donald Wald F statistic	3918.48 {16.38}		8045.46 {16.38}	
Control	YES	YES	YES	YES
N	4483	4483	4483	4483

Standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table 4.10 : IV Estimations IB for Country Governance

Variable	Model 1		Model 2	
	First	Second	First	Second
COC		-0.117***		
		(0.06)		
L.COC	0.683***			
	(0.02)			
VA				-0.072
				(0.07)
L.VA			0.764***	
			(0.00)	
Anderson canon. corr. LM statistic	582.02 [0.0000]		699.85 [0.0000]	
Cragg-Donald Wald F statistic	1218.32		1887.88	
	{16.38}		{16.38}	
Control	YES	YES	YES	YES
N	1218	1218	1218	1218

Standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

4.4.4.2 IV-2SLS Outcomes for Globalisation-Bank Efficiency

According to Model 1- 5 in Table 4.11 and 4.12, the null hypothesis is rejected when the Anderson canonical correlations likelihood ratio (LM) test shows a p-value less than 0.05, indicating that there is no problem with underidentification. Furthermore, the null hypothesis of weak instruments should be rejected since the Cragg-Donald Wald F statistic exceeds the threshold value (16.38). Both of above indicate that IV met the correlation assumption. As a result, the IV-2SLS estimate method can be considered as the final outcome.

Regarding the impact of different dimensions of globalisation on CBs, the results indicate that the sign for trade globalisation, financial globalisation, interpersonal globalisation, cultural globalisation, and informational

globalisation remain consistent with the basic regression and are statistically significant.

Regarding the impact of different dimensions of globalisation on IBs, the results indicate that the sign for trade globalisation, interpersonal globalisation, cultural globalisation, and informational globalisation remain consistent with the basic regression and are statistically significant. However, the impact of financial globalisation on IBs turns positive and becomes statistically significant. Increased competition from both domestic and foreign financial institutions is a result of financial globalisation (Akdoğan, 2018; Zhang & Daly, 2014). IBs may innovate their service offerings, enhance client service, and implement more effective operating models in order to stay competitive. These actions can lead to increased efficiency.

Table 4.11 : IV Estimations CB for Globalisation

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	First	Second	First	Second	First	Second	First	Second	First	Second
TrGI		0.013*** (0.00)								
I. TrGI	0.726*** (0.01)									
FiGI				0.007*** (0.00)						
I. FiGI			0.656*** (0.00)							
IpGI						-0.007*** (0.00)				
I. IpGI					0.713*** (0.00)					
InGI								-0.015*** (0.00)		
I. InGI						0.783*** (0.00)				
CuGI										-0.005*** (0.00)
I. CuGI									0.760*** (0.00)	
Anderson canon. corr. LM statistic	2306.24 [0.0000]		2059.47 [0.0000]		2886.87 [0.0000]		3249.97 [0.0000]		2708.54 [0.0000]	
Cragg-Donald Wald F statistic	5213.74 {16.38}		4100.99 {16.38}		9574.70 {16.38}		15226.33 {16.38}		7856.24 {16.38}	
Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	4483	4483	4483	4483	4483	4483	4483	4483	4483	4483

Standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table 4.12 : IV Estimations IB for Globalisation

Variable	Model 1		Model 2		Model 3		Model 4		Model 5	
	First	Second	First	Second	First	Second	First	Second	First	Second
TrGI		0.026*** (0.00)								
I. TrGI	0.621*** (0.02)									
FiGI				0.008** (0.00)						
I. FiGI			0.589*** (0.02)							
IpGI						-0.021*** (0.00)				
I. IpGI					0.671*** (0.01)					
InGI								-0.022*** (0.00)		
I. InGI							0.790*** (0.01)			
CuGI										-0.025*** (0.00)
I. CuGI									0.732*** (0.02)	
Anderson canon. corr. LM statistic	487.04 [0.0000]		435.08 [0.0000]		750.95 [0.0000]		840.46 [0.0000]		672.01 [0.0000]	
Cragg-Donald Wald F statistic	863.56 {16.38}		711.86 {16.38}		2315.67 {16.38}		3458.78 {16.38}		1697.00 {16.38}	
Control	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	1218	1218	1218	1218	1218	1218	1218	1218	1218	1218

Standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

4.4.5 Does EPU Moderate the Impact of CG on Banks' Efficiency?

FEM regression analysis was found to be the ultimate result for Models 1 and 2 in Tables 4.13 and 4.14, as demonstrated by the BP LM and Hausman tests of Models 1 and 2 shown in Tables 4.13 and 4.14, in conjunction with the decision rules described in Section 3.3.2.1.1 (Panel Regression Analysis).

FEM outcomes in Table 4.13 indicate that EPU weakened the negative impact of COC on CBs' efficiency based on Model 1, however, the moderating effect of EPU on the impact of COC on IBs' efficiency is not significant as demonstrated in Models 1 of Table 4.14.

The Theory of Uncertainty states that controlling uncertainty should be the primary goal of the government. In times of uncertainty, governments may be more inclined to streamline regulations and reduce bureaucratic obstacles, which can help banks operate more efficiently despite the constraints imposed by COC measures. Jiang et al. (2019) argue that EPU generally leads the government to postpone and redirect its efforts towards mitigating other issues, as managing uncertainty should be the foremost priority. Consequently, all resources are focused on maintaining economic stability. EPU reduces the government's allocation of resources towards controlling corruption, leading bank personnel to enhance efficiency through rent-seeking behaviour. Furthermore, the government's focus on economic stability leads to the relaxation of previous strong supervisory model and high-level restrictions. Banks, as financial pillars, can enjoy more freedom and autonomy in their operations. In order to better serve their clients, banks can improve

their resource management, asset allocation, and service organisation. This increased independence allows banks to innovate and respond more quickly to changing market conditions, potentially enhancing their productivity and competitiveness.

Regarding the insignificant coefficient of $COC*EPU$ for IBs, this can be explained as follows: IBs operate under Shariah principles, which inherently emphasise transparency, justice, and ethical behaviour (Dhumale & Sapcanin, 1998; Menne et al., 2024). These strong internal Shariah governance mechanisms may limit the extent to which the combined effect of COC and EPU can influence their operations.

Table 4.13 : Regression Results of Moderating Effect of EPU on the Impact of CG on CBs: All Regions

Variable	Model 1			Model 2		
	ols	fe	re	ols	fe	re
EPU	0.103*** (0.03)	0.025 (0.04)	0.084** (0.03)	0.153*** (0.05)	0.053 (0.05)	0.133*** (0.05)
COC	0.006 (0.01)	-0.120*** (0.03)	0.005 (0.01)			
COC*EPU	0.065 (0.04)	0.188** (0.05)	0.072 (0.05)			
VA				-0.042*** (0.01)	0.049* (0.03)	-0.047*** (0.01)
VA*EPU				0.170** (0.08)	0.220*** (0.08)	0.183** (0.08)
size	-0.050*** (0.00)	-0.187*** (0.01)	-0.054*** (0.00)	-0.048*** (0.00)	-0.194*** (0.01)	-0.053*** (0.00)
capital	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.007*** (0.00)	-0.003*** (0.00)
quality	0.001 (0.00)	-0.002** (0.00)	0.001 (0.00)	0.000 (0.00)	-0.002** (0.00)	-0.000 (0.00)
CPI	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
GDPG	0.003*** (0.00)	0.001 (0.00)	0.002*** (0.00)	0.003*** (0.00)	0.001 (0.00)	0.003*** (0.00)
COVID	-0.155*** (0.01)	-0.085*** (0.01)	-0.149*** (0.01)	-0.150*** (0.01)	-0.081*** (0.01)	-0.144*** (0.01)
_cons	1.735*** (0.06)	4.774*** (0.18)	1.835*** (0.07)	1.688*** (0.06)	5.000*** (0.17)	1.807*** (0.06)
N	4843	4843	4843	4843	4843	4843
r2	0.272	0.340		0.272	0.339	
r2_a	0.270	0.286		0.271	0.285	
F/VIF	200.425***	256.312***	1.79	200.604***	254.828***	2.27
BP LM	chibar2(01) = 23.64***			chibar2(01) = 26.80***		
chi2			1796.651***			1802.275***
Hausman		chi2(9) = 529.53***			chi2(9) = 502.01***	

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.14 : Regression Results of Moderating Effect of EPU on the Impact of CG on IBs: All Regions

Variable	Model 1			Model 2		
	ols	fe	re	ols	fe	re
EPU	-0.208*** (0.07)	-0.156** (0.08)	-0.186** (0.07)	0.061 (0.12)	0.174 (0.12)	0.122 (0.12)
COC	0.034** (0.02)	-0.038 (0.04)	0.039* (0.02)			
COC*EPU	-0.017 (0.10)	-0.019 (0.11)	-0.025 (0.11)			
VA				-0.029 (0.02)	-0.020 (0.06)	-0.044* (0.03)
VA*EPU				0.371*** (0.13)	0.446*** (0.13)	0.397*** (0.13)
size	-0.055*** (0.00)	-0.146*** (0.02)	-0.061*** (0.01)	-0.048*** (0.00)	-0.148*** (0.02)	-0.056*** (0.01)
capital	-0.002*** (0.00)	-0.003** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)
quality	-0.003*** (0.00)	-0.006*** (0.00)	-0.004** (0.00)	-0.003** (0.00)	-0.005*** (0.00)	-0.003** (0.00)
CPI	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000** (0.00)	-0.000*** (0.00)
GDPG	0.006*** (0.00)	0.006*** (0.00)	0.006*** (0.00)	0.005*** (0.00)	0.005*** (0.00)	0.006*** (0.00)
COVID	-0.157*** (0.02)	-0.095*** (0.02)	-0.143*** (0.02)	-0.165*** (0.02)	-0.112*** (0.02)	-0.153*** (0.02)
_cons	1.740*** (0.10)	3.734*** (0.34)	1.875*** (0.15)	1.551*** (0.10)	3.763*** (0.35)	1.712*** (0.14)
N	1333	1333	1333	1333	1333	1333
r2	0.313	0.252		0.313	0.258	
r2_a	0.308	0.177		0.309	0.184	
F/VIF	66.975***	45.245***	2.13	67.117***	46.813***	2.96
BP LM	chibar2(01) = 122.67***			chibar2(01) = 125.98**		
chi2			475.974***			479.308***
Hausman		chi2(9) = 53.24***			chi2(9) = 57.07***	

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.4.6 Does EPU Moderate the Impact of Globalisation on Banks' Efficiency?

The BP LM test and Hausman test outcomes indicate that FEM is the final outcome from Model 1-5 in Tables 15 and 16. The FEM outcome indicates that EPU weakens the positive impact of financial globalisation and trade globalisation on CBs' efficiency. However, EPU strengthens the negative impact of interpersonal globalisation on both types of banks' efficiency. Finally,

EPU strengthens the negative impact of interpersonal globalisation on CBs' efficiency.

EPU weakens the positive impact of trade globalisation on CBs' efficiency. According to Theory of Uncertainty, EPU will reduce economic activities. For instance, D'Mello and Toscano (2020) argue that firms' trade credit decline significantly when EPU increases and this reduction effect is achieved through relation-specific investments and financial limitations. The reduced business volume can limit the potential gains that banks could achieve from offering these services and prevent banks from enjoying the benefits of economies of scale. Besides that, Krol (2018) argues that products, services, and investments across international borders are negatively impacted by uncertainty. When there are sunk costs involved in taking action, entrepreneurs choose to wait rather than take action, which lowers both domestic and international trade. Businesses may delay or reduce their trade activities, further impacting the demand for banking services and overall efficiency. Finally, trade liberalisation may have benefits for risk diversification, but these may be outweighed by greater market volatility brought on by EPU. Even banks with diversified portfolios may find it difficult to adequately manage risks in erratic markets, which could reduce their efficiency.

Since IBs follow Shariah-compliant business models, their operations may be more insulated from the effects of economic policy shifts that directly affect trade relations. Therefore, the interaction between EPU and trade globalisation may not significantly alter their efficiency.

EPU weakens the positive impact of financial globalisation on CBs' efficiency. According to Theory of Uncertainty, EPU will strengthen information asymmetry and risk aversion. Although financial globalisation provides banks with many benefits, during periods of high economic uncertainty, banks tend to become more risk-averse, which offsets the benefits brought by a globalised environment. For example, banks are increasingly engaging in trading, derivatives, and commission- and fee-based activities rather than traditional lending, leading to lower risks and lower returns (DeYoung & Roland, 2001; Meslier et al., 2014). They may hold more reserves or conservative investments, which can reduce their efficiency as they prioritise safety over profitability. A preference for maintaining more liquid assets, which often give lower returns, is caused by high uncertainty. High EPU also affects the accuracy of banks' assessment of borrowers' qualifications and repayment abilities, leading to cautious lending by banks (Shabir et al., 2022). Finally, EPU slows down the growth of bank credit (Wu et al., 2021). All the above effects of EPU will reduce the impact of financial globalisation on banks' efficiency. In addition, since IBs follow Sharia-compliant business models, their operations may be more insulated from the effects of economic policy shifts that directly affect financial activities. Therefore, the interaction between EPU and trade globalisation may not significantly alter their efficiency.

EPU strengthens the negative impact of interpersonal globalisation on both types of banks' efficiency. This can be explained by the following. According to the Theory of Uncertainty, daily planning and firm operations become increasingly complex, requiring greater coordination. EPU can increase the

complexity of managing diverse interpersonal relationships within banks, especially between local and foreign managers. The uncertainty surrounding economic policies may lead to conflicting views and strategies among managers, resulting in inefficiencies in decision-making and operations.

EPU strengthens the negative impact of informational globalisation on CBs' efficiency. According to the Theory of Uncertainty, managing uncertainty becomes the government's central focus, while businesses experience disruptions in their daily operations. High EPU can cause governments to prioritise solving more urgent economic issues above enforcing or implementing regulations. The inability to predict the exact date and method of regulation implementation resulting from this delay may make it more difficult for banks to adhere to data privacy and other legal requirements. When policies related to data security change, banks may need to incur high costs to restructure their systems to ensure compliance with new regulations and standards. This restructuring may involve updating and upgrading existing technology and facilities, procuring new software and hardware, and providing training and education to employees to adapt to new data security requirements. Information asymmetries can also be made worse by EPU (Brogaard & Detzel, 2015). The competition between banks has intensified as the consequences of bad debts resulting from information asymmetries make high-quality customers more sought after. Fierce competition leads to higher costs, which will deteriorate bank efficiency.

In conclusion, for CBs, changes in regulations regarding data privacy and security may necessitate costly restructuring, leading to inefficiencies. However, IBs are often already operating within a framework that is more stable and aligned with ethical investment principles, reducing their exposure to costs associated with adapting to changing information security regulations or policy shifts. This leads to an insignificant impact of EPU on the impact of informational globalisation for IBs.

EPU strengthens the negative impact of cultural globalisation on CBs' efficiency. According to the Theory of Uncertainty, firms experience disruptions in their daily operations due to EPU. EPU increases the need for banks to continuously adjust their development strategies in response to uncertain economic conditions. This adjustment process can lead to increased frequency of friction among management personnel from different cultures, as they may have varying views on how to navigate these uncertainties. This friction can arise from differences in cultural norms, communication styles, and approaches to decision-making, which could impede banks' efficiency.

For the insignificant moderating effect of EPU on the impact of cultural globalisation on IBs' efficiency, this may contribute to the inherent principle of IBs. The operating system's degrees of freedom are likewise constrained in IBs since all methods must adhere to the Shariah (Ahmad, 1994). While EPU may introduce external pressures and the need for adjustments, the operations of IBs are typically not impacted by these adjustments due to internal consistency and standardisation brought by the Shariah.

Table 4.15 : Regression Results of Moderating Effect of EPU on the Impact of Globalisation on CBs: All Regions

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	0.712*** (0.12)	0.488*** (0.13)	0.705*** (0.13)	0.794*** (0.11)	0.587*** (0.13)	0.808*** (0.12)	0.983*** (0.13)	0.676*** (0.13)	0.992*** (0.13)	1.670*** (0.20)	0.498*** (0.20)	1.599*** (0.20)	0.733*** (0.12)	0.204 (0.13)	0.764*** (0.13)
TrGI	0.003*** (0.00)	0.012*** (0.00)	0.004*** (0.00)												
TrGI*EPU	-0.011*** (0.00)	-0.009*** (0.00)	-0.011*** (0.00)												
FIGI				0.003*** (0.00)	0.004*** (0.00)	0.003*** (0.00)									
FIGI*EPU				-0.013*** (0.00)	-0.011*** (0.00)	-0.013*** (0.00)									
IpGI							0.003*** (0.00)	0.000 (0.00)	0.003*** (0.00)						
IpGI*EPU							-0.017*** (0.00)	-0.013*** (0.00)	-0.017*** (0.00)						
InGI										-0.000 (0.00)	-0.013*** (0.00)	-0.001*** (0.00)			
InGI*EPU										-0.021*** (0.00)	-0.007*** (0.00)	-0.021*** (0.00)			
CuGI													0.002*** (0.00)	-0.008*** (0.00)	0.002*** (0.00)
CuGI*EPU													-0.012*** (0.00)	-0.005*** (0.00)	-0.013*** (0.00)
size	-0.055*** (0.01)	-0.166*** (0.01)	-0.061*** (0.01)	-0.052*** (0.01)	-0.189*** (0.01)	-0.057*** (0.01)	-0.053*** (0.01)	-0.185*** (0.01)	-0.057*** (0.01)	-0.040*** (0.01)	-0.096*** (0.01)	-0.041*** (0.01)	-0.047*** (0.01)	-0.171*** (0.01)	-0.051*** (0.01)
capital	-0.003*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.005*** (0.00)	-0.003*** (0.00)
quality	0.001*** (0.00)	-0.003*** (0.00)	0.001*** (0.00)	0.002*** (0.00)	-0.002*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	-0.002*** (0.00)	0.001*** (0.00)	0.000 (0.00)	-0.003*** (0.00)	-0.000 (0.00)	0.001*** (0.00)	-0.004*** (0.00)	0.001*** (0.00)
CPI	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
GDPG	0.004*** (0.00)	-0.000 (0.00)	0.004*** (0.00)	0.003*** (0.00)	0.001*** (0.00)	0.003*** (0.00)	0.003*** (0.00)	0.001*** (0.00)	0.003*** (0.00)	0.000 (0.00)	-0.002*** (0.00)	-0.000 (0.00)	0.003*** (0.00)	-0.001*** (0.00)	0.003*** (0.00)
COVID	-0.143*** (0.01)	-0.054*** (0.01)	-0.134*** (0.01)	-0.151*** (0.01)	-0.084*** (0.01)	-0.145*** (0.01)	-0.144*** (0.01)	-0.084*** (0.01)	-0.137*** (0.01)	-0.155*** (0.01)	-0.084*** (0.01)	-0.146*** (0.01)	-0.150*** (0.01)	-0.095*** (0.01)	-0.145*** (0.01)
cons	1.670*** (0.05)	3.677*** (0.20)	1.784*** (0.06)	1.633*** (0.05)	4.642*** (0.18)	1.727*** (0.06)	1.625*** (0.06)	4.750*** (0.17)	1.716*** (0.06)	1.487*** (0.06)	3.634*** (0.18)	1.614*** (0.07)	1.585*** (0.06)	4.869*** (0.17)	1.680*** (0.06)
N	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843	4843
r2	0.283	0.355		0.280	0.341		0.283	0.342		0.291	0.391		0.275	0.350	
r2 a	0.282	0.303		0.279	0.287		0.281	0.288		0.290	0.341		0.274	0.297	
FVIF	212.320***	274.181***	6.94	209.331***	256.853***	6.08	211.469***	258.078***	7.35	220.770***	318.955***	7.54	203.791***	267.897***	6.78
BP LM		chibar2(01) = 37.37***			chibar2(01) = 29.91***			chibar2(01) = 26.35***			chibar2(01) = 79.83***			chibar2(01) = 29.37***	
chi2		1921.202***			1883.585***			1898.380***			2050.279***			1833.643***	
Hausman		chi2(9) = 539.75***			chi2(9) = 472.79***			chi2(9) = 476.25***			chi2(9) = 677.94***			chi2(9) = 565.22***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.16 : Regression Results of Moderating Effect of EPU on the Impact of Globalisation on IBs: All Regions

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	-0.343 [*] (0.18)	-0.350 [*] (0.18)	-0.358 ^{**} (0.18)	-0.254 [*] (0.20)	-0.375 [*] (0.21)	-0.250 [*] (0.19)	-0.027 (0.29)	0.419 (0.28)	0.125 (0.28)	0.612 (0.46)	-0.125 (0.51)	0.311 (0.49)	-0.187 (0.22)	-0.389 [*] (0.23)	
TrGI	0.001 [*] (0.00)	0.010 ^{***} (0.00)	0.001 [*] (0.00)												
TrGI*EPU	0.002 (0.00)	0.004 (0.00)	0.003 (0.00)												
FIGI				0.001 ^{**} (0.00)	0.000 (0.00)	0.001 (0.00)									
FIGI*EPU				0.001 (0.00)	0.004 (0.00)	0.002 (0.00)									
IpGI							0.003 ^{***} (0.00)	-0.011 ^{***} (0.00)	0.003 ^{***} (0.00)						
IpGI*EPU							-0.003 (0.00)	-0.009 ^{**} (0.00)	-0.005 (0.00)						
InGI										-0.017 ^{***} (0.00)		-0.005 ^{***} (0.00)			
InGI*EPU										-0.001 (0.00)	-0.008 (0.01)	-0.006 (0.01)			
CuGI													0.001 (0.00)	-0.019 ^{***} (0.00)	
CuGI*EPU													0.005 (0.00)	0.002 (0.00)	
size	-0.054 ^{***} (0.00)	-0.150 ^{***} (0.02)	-0.059 ^{***} (0.01)	-0.054 ^{***} (0.00)	-0.148 ^{***} (0.02)	-0.059 ^{***} (0.01)	-0.061 ^{***} (0.00)	-0.146 ^{***} (0.02)	-0.065 ^{***} (0.01)	-0.046 ^{***} (0.00)	-0.110 ^{***} (0.01)	-0.043 ^{***} (0.01)	-0.054 ^{***} (0.00)	-0.058 ^{***} (0.01)	
capital	-0.003 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	
quality	-0.003 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.006 ^{***} (0.00)	-0.004 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.002 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	-0.003 ^{***} (0.00)	
CPI	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	-0.000 ^{***} (0.00)	
GDPG	0.005 ^{**} (0.00)	0.005 ^{**} (0.00)	0.006 ^{**} (0.00)	0.006 ^{**} (0.00)	0.006 ^{**} (0.00)	0.006 ^{**} (0.00)	0.006 ^{**} (0.00)	0.005 ^{**} (0.00)	0.006 ^{**} (0.00)	0.006 ^{**} (0.00)	-0.001 (0.00)	0.005 ^{**} (0.00)	0.003 ^{**} (0.00)	0.006 ^{**} (0.00)	
COVID	-0.167 ^{***} (0.02)	-0.060 [*] (0.02)	-0.151 ^{***} (0.02)	-0.165 ^{***} (0.02)	-0.105 ^{***} (0.02)	-0.150 ^{***} (0.02)	-0.150 ^{***} (0.02)	-0.131 ^{***} (0.02)	-0.133 ^{***} (0.02)	-0.142 ^{***} (0.02)	-0.105 ^{***} (0.02)	-0.124 ^{***} (0.02)	-0.167 ^{***} (0.02)	-0.147 ^{***} (0.02)	
cons	1.666 ^{**} (0.10)	3.275 ^{**} (0.36)	1.775 ^{**} (0.13)	1.647 ^{**} (0.10)	3.762 ^{**} (0.36)	1.765 ^{**} (0.14)	1.714 ^{**} (0.10)	4.403 ^{**} (0.37)	1.786 ^{**} (0.14)	1.656 ^{**} (0.11)	4.100 ^{**} (0.33)	1.849 ^{**} (0.15)	4.805 ^{**} (0.35)	1.776 ^{**} (0.14)	
N	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	1333	
r2	0.316	0.269		0.314	0.252		0.323	0.266		0.312	0.359		0.293		
r2 a	0.311	0.197		0.310	0.178		0.318	0.193		0.307	0.295		0.223		
FVIF	67.910 ^{***}	49.640 ^{***}	3.86	67.420 ^{***}	45.390 ^{***}	4.15	70.148 ^{***}	48.882 ^{***}	7.49	66.529 ^{**}	75.271 ^{***}	7.91	55.869 ^{**}	5.36	
BP LM		chibar2(01) = 120.32 ^{***}			chibar2(01) = 117.72 ^{***}			chibar2(01) = 100.28 ^{***}			chibar2(01) = 158.71 ^{***}		chibar2(01) = 106.04 ^{***}		
chi2			488.895 ^{***}			479.743 ^{**}			497.838 ^{***}			523.447 ^{***}		476.825 ^{***}	
Hausman		chi2(9) = 84.29 ^{***}			chi2(9) = 55.65 ^{***}			chi2(9) = 82.52 ^{***}			chi2(9) = 193.90 ^{***}		chi2(9) = 132.32 ^{***}		

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.5 Chapter Summary

This chapter provided the analysis of data and examined the four research objectives. DEA was employed to generate bank efficiency in the first stage. In the second stage, the OLS, FEM and REM were performed to examine the impact of CG on bank efficiency (Research Objective 1) and the impact of globalisation on bank efficiency (Research Objective 2). To achieve a more robust outcome, the IV-2SLS technique was performed. This study further examined the moderating effect of EPU on the impact of CG on bank efficiency (Research Objective 3) and the moderating effect of EPU on the impact of globalisation on bank efficiency (Research Objective 4).

With regards to the first research objective, by summarising the outcomes, it was observed that higher COC was associated with lower efficiency for both types of banks. However, the impact of VA was not significant for both types of banks. For the second research objective, outcomes indicated that trade globalisation and financial globalisation had a positive relationship whereas interpersonal globalisation, cultural globalisation, and informational globalisation had a negative relationship with both types of banks' efficiency. This study also provided an overview of specific world regions (ME, SEA, and SA) to conduct heterogeneity analysis in Appendix B. For the third research objective, the moderating effect of EPU on CG was also examined. EPU was found to weaken the negative impact of COC on CBs' efficiency while the moderating effect of EPU on the impact of COC on IBs' efficiency was not significant. For the fourth research objective, the moderating effect of EPU on globalisation was investigated. EPU weakened the positive impact of financial

globalisation and trade globalisation on CBs' efficiency. However, EPU strengthened the negative impact of interpersonal globalisation on both types of banks' efficiency. Finally, EPU strengthened the negative impact of interpersonal globalisation and cultural globalisation on CBs' efficiency.

Table 4.17 provides a concise overview of research objectives, hypotheses, findings, and the direction of results.

The following Chapter 5 provides a comprehensive conclusion, beginning with a clear restatement of the research objectives and summarising the key findings from this study. The contributions of the research will be organised into three areas: contributions to knowledge, practice, and policy. The chapter will also discuss the study's limitations and suggestions for future research.

Table 4.17 : Summary of Chapter 4.5

Research objectives	Hypotheses	Outcomes
RO1: To examine the impact of CG on CB and IB efficiency in ME, SEA and SA.	H1(1a): COC has a negative influence on CBs' efficiency.	Support/Significant -0.286***
	H1(1b): COC has a negative influence on IBs' efficiency.	Support/Significant -0.117***
	H1(2a): VA has a significant positive influence on CBs' efficiency.	Not Support/Insignificant -0.028
	H1(2b): VA has a significant positive influence on IBs' efficiency.	Not Support/Insignificant -0.072
RO2: To examine the impact of globalisation on CB and IB efficiency in ME, SEA and SA.	H2(1a): Trade globalisation has a significant positive influence on CBs' efficiency.	Support/Significant 0.013***
	H2(1b): Trade globalisation has a significant positive influence on IBs' efficiency.	Support/Significant 0.026***
	H2(2a): Financial globalisation has a significant positive influence on CBs' efficiency.	Support/Significant 0.007***
	H2(2b): Financial globalisation has a significant positive influence on IBs' efficiency.	Support/Significant 0.008**
	H2(3a): Interpersonal globalisation has a significant negative influence on CBs' efficiency.	Support/Significant -0.007***
	H2(3b): Interpersonal globalisation has a significant negative influence on IBs' efficiency.	Support/Significant -0.021***
	H2(4a): Informational globalisation has a significant negative influence on CBs' efficiency.	Support/Significant -0.015***
	H2(4b): Informational globalisation has a significant negative influence on IBs' efficiency.	Support/Significant -0.022***
	H2(5a): Cultural globalisation has a significant negative influence on CBs' efficiency.	Support/Significant -0.005***
	H2(5b): Cultural globalisation has a significant negative influence on IBs' efficiency.	Support/Significant -0.025***

Table 4.17 : Continued

Research objectives	Hypotheses	Outcomes
RO3: To investigate the moderating effect of EPU on the impact of CG on CB and IB efficiency in ME, SEA and SA.	H3(1a): There is a significant moderating role of EPU on the nexus between COC and CBs' efficiency.	Support/Significant 0.188***
	H3(1b): There is a significant moderating role of EPU on the nexus between COC and IBs' efficiency.	Not Support/Insignificant -0.019
	H3(2a): There is a significant moderating role of EPU on the nexus between VA and CBs' efficiency.	Not applicable
	H3(2b): There is a significant moderating role of EPU on the nexus between VA and IBs' efficiency.	Not applicable
	H4(1a): There is a significant moderating role of EPU on the nexus between trade globalisation and CBs' efficiency.	Support/Significant -0.009***
RO4: To investigate the moderating effect of EPU on the impact of globalisation on CB and IB efficiency in ME, SEA and SA.	H4(1b): There is a significant moderating role of EPU on the nexus between trade globalisation and IBs' efficiency.	Not Support/Insignificant 0.004
	H4(2a): There is a significant moderating role of EPU on the nexus between financial globalisation and CBs' efficiency.	Support/Significant -0.011***
	H4(2b): There is a significant moderating role of EPU on the nexus between financial globalisation and IBs' efficiency.	Not Support/Insignificant 0.004
	H4(3a): There is a significant moderating role of EPU on the nexus between interpersonal globalisation and CBs' efficiency.	Support/Significant -0.013***
	H4(3b): There is a significant moderating role of EPU on the nexus between interpersonal globalisation and IBs' efficiency.	Support/Significant -0.009**
	H4(4a): There is a significant moderating role of EPU on the nexus between informational globalisation and CBs' efficiency.	Support/Significant -0.007***
	H4(4b): There is a significant moderating role of EPU on the nexus between informational globalisation and IBs' efficiency.	Not Support/Insignificant -0.008
	H4(5a): There is a significant moderating role of EPU on the nexus between cultural globalisation and CBs' efficiency.	Support/Significant -0.005**
	H4(5b): There is a significant moderating role of EPU on the nexus between cultural globalisation and IBs' efficiency.	Not Support/Insignificant 0.002

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

First, this chapter offers a broad overview of the research findings in line with the four research objectives. Next, the main contributions of this research to knowledge, practice, and policy are highlighted. The final section delves into the study's limitations and provides recommendations for future research.

5.2 Conclusion

This study is an empirical study that investigated bank efficiency issues across three main Islamic hubs to add to the body of literature under the four objectives of this research. First, this research focuses on the effect of CG on bank efficiency, followed by the impact of globalisation on bank efficiency. Next, it examines the moderating effect of EPU on the relationship between CG and bank efficiency, and finally, the moderating effect of EPU on the relationship between globalisation and bank efficiency. Consequently, this section presents an overview of the findings from each research goal.

5.2.1 Research Objective 1: CG and Bank Efficiency

To examine these objectives, comprehensive analyses were conducted and presented in Chapter 4. Related to the first objective, several conclusions were drawn from the econometric research that was conducted. First, the outcomes provide evidence that a negative nexus exists for COC and both types of banks'

efficiency. The negative relationship aligns with the Grease the Wheels theory, which suggests that corruption can act as a lubricant to overcome bureaucratic obstacles. Second, the effect of VA on both types of banks' efficiency is not significant. Banks in these countries may prioritise internal governance systems like risk management and regulatory compliance above more extensive political participation. The insignificant effect of VA on bank efficiency contradicts the Principal-Agent theory.

5.2.2 Research Objective 2: Globalisation and Bank Efficiency

For the second objective, the estimation results provide evidence for the impact of globalisation. First, trade globalisation positively influences the efficiency of both types of banks. This conclusion echoes the Theory of Trade, which suggests that trade globalisation drives the rise of international trade and economic growth, thereby stimulating greater financial demand. Second, financial globalisation positively influences the efficiency of both types of banks, validating the Financial Development Theory. According to this theory, financial globalisation enhances access to external capital, facilitates the acquisition of advanced knowledge, and intensifies competition, all of which contribute to improved bank efficiency. Third, interpersonal globalisation and cultural globalisation exhibit a negative association with the efficiency of both types of banks, supporting the Social Friction Theory. This theory posits that interpersonal and cultural frictions increase operational costs for banks, ultimately reducing their efficiency. Fourth, informational globalisation negatively affects the efficiency of both types of banks, a finding aligned with the Theory of Information Security. This theory suggests that increased

information exchange compels banks to make continuous investments in data security, thereby incurring additional costs and operational burdens.

5.2.3 Research Objective 3: Moderating Effect of EPU between CG and Bank Efficiency

For the third objective, the analysis provides the outcomes for the moderating effect of EPU on the relationship between CG and bank efficiency. First, EPU weakens the negative impact of COC on CBs' efficiency while the moderating effect of EPU on the impact of COC on IBs' efficiency is not significant. According to the Theory of Uncertainty, controlling uncertainty should be a primary goal of government policy. In some contexts, encouraging rent-seeking behaviour among banks to "grease the wheels" and enhance efficiency may be seen as a temporary measure. This can help banks navigate bureaucratic hurdles and improve decision-making speed, ultimately boosting short-term efficiency.

5.2.4 Research Objective 4: Moderating Effect of EPU between Globalisation and Bank Efficiency

For the fourth objective, the analysis provides the outcomes for the moderating effect of EPU on the relationship between globalisation and bank efficiency. EPU weakens the positive impact of trade globalisation and financial globalisation on CBs' efficiency and strengthens the negative impact of information globalisation and cultural globalisation on CBs' efficiency. Besides that, EPU strengthens the negative impact of interpersonal globalisation on both types of banks' efficiency. According to Theory of Uncertainty, in a more uncertain environment, economic activities will be reduced while information

asymmetry and risk aversion will be amplified. Therefore, the positive impact of trade globalisation and financial globalisation on CBs' efficiency are weakened by EPU. Additionally, the Theory of Uncertainty states that as everyday planning and business operations grow more complicated, more coordination is needed. This, in turn, can exacerbate the negative effects of interpersonal globalisation and cultural globalisation. Finally, the Theory of Uncertainty argues that while managing uncertainty should be the primary focus, enforcing or implementing information security regulations becomes secondary. The inability to predict the exact timing and method of implementing information security regulations further strengthen the negative impact of information globalisation on bank efficiency.

5.3 Contribution of the Research

Given the wealth of previous studies on the factors influencing bank efficiency, this study examines the impact of CG and globalisation on bank efficiency. Additionally, incorporating EPU as a moderator provides insights into the underlying mechanisms. The sample consists of 110 IBs and 353 CBs from three main Islamic hubs. Several contributions to knowledge, practice, and policy are made by this research during the examination process.

5.3.1 Contributions to Knowledge

From a theoretical standpoint, this study examines the effects of CG and globalisation on bank efficiency, while introducing EPU as a moderator in the three main Islamic hubs, thus enriching the existing literature on bank efficiency. Furthermore, this study differs from earlier related research, which

primarily focuses on price efficiency, revenue efficiency, or productivity. Additionally, the theoretical foundation of this study diverges from previous work by combining the Grease the Wheels theory, the Principal-Agent Theory, the Theory of Trade, the Financial Development Theory, the Social Friction Theory, the Theory of Information Security, and the Theory of Uncertainty. These novel contributions offer a valuable addition to the existing body of knowledge on bank efficiency.

Next, while there is extensive literature analysing the effects of CG and globalisation on firms, as well as the impact of EPU on entities, few studies have explored the impact of CG and globalisation on bank efficiency, particularly in the three main Islamic hubs. Furthermore, the relationship between CG and EPU, as well as between globalisation and EPU, has been rarely examined. This study addresses this gap by analysing the effects of CG and globalisation on bank efficiency in these three hubs and introduces EPU as a moderator in this context. As a result, the study contributes to bridging the existing knowledge gap. Moreover, the findings indicate that EPU has a moderating effect on the impact of CG and globalisation on bank efficiency. The Theory of Uncertainty provides a novel perspective on the relationship between CG, globalisation, and bank efficiency, advancing the literature and offering a fresh avenue for future research in related fields.

5.3.2 Contributions to Practice

This study draws the conclusion that COC reduces both types of banks' efficiency while the impact of VA on bank efficiency is not significant. Trade

globalisation and financial globalisation increase both types of banks' efficiency. Interpersonal globalisation, cultural globalisation, and informational globalisation reduce both types of banks' efficiency. Besides that, EPU weakens the negative impact of COC on CBs' efficiency. Finally, EPU weakens the positive impact of financial globalisation and trade globalisation on CBs' efficiency and strengthens the negative impact of cultural globalisation and informational globalisation on CBs' efficiency. The negative impact of interpersonal globalisation on both types of banks' efficiency is strengthened by EPU.

Banks ought to assess whether they can streamline any of their external anti-corruption measures without sacrificing their moral principles to reduce the negative impact of COC on bank efficiency. Bank managers also need to manage the current trend of globalisation, leveraging the benefits of trade and financial globalisation to expand their operations. They should avoid the impact of issues brought by social globalisation on bank efficiency, especially the friction caused by culture and communication. Even if a decline in demand from consumers and companies could result from EPU, banks can maintain a steady flow of revenue by diversifying into new service sectors like improving wealth management and providing additional financing options. Finally, it is imperative for bank managers to exhibit flexibility by rapidly modifying their business plans and risk management protocols in response to the dynamic economic landscape.

The study's findings may provide suggestions for investors seeking capital appreciation as their primary goal. If all possible factors including CG, globalisation and EPU are given due consideration by bank managers, investors can forecast the efficiency of these two types of banks and expect capital return. The findings of this study can help investors construct more refined investment portfolios.

5.3.3 Contributions to Policy

This study evaluates the effects of CG and globalisation on bank efficiency as well as the moderating effect of EPU in the context of three main Islamic hubs, offering suggestions for enhancing business performance. The results have significant ramifications for the efficiency improvements of banks and offer useful information for bank managers and investors in three main Islamic hubs.

Policymakers can better serve the enhancement of bank efficiency by optimising some dimensions of institutional quality. Because COC has a negative impact on bank efficiency, the following suggestions are put forward. Governments should optimise processes, reduce government delays, and address environments that are conducive to corruption. Governments should strengthen legal and institutional development, improve relevant laws and regulations, enhance enforcement efficiency, and provide better legal and institutional protection for banks and regulatory agencies.

Policymakers can adjust policies strategically to address the changes from globalisation, especially considering this study's findings where trade

globalisation, financial globalisation, interpersonal globalisation, and cultural globalisation all have an impact on bank efficiency. Governments can help banks expand their business and enhance efficiency by promoting international trade and providing trade finance support. Besides, by providing a more open financial market environment and encouraging foreign investment, the efficiency of banks can be boosted. However, conflict brought by globalisation should not be overlooked. Governments can support banks to better handle communication and management challenges among employees and clients from different cultural backgrounds by providing cross-cultural training and support. Finally, data security risks from informational globalisation can be alleviated by enacting stricter data security regulations and supporting banks in strengthening their information technology security measures.

Furthermore, policymakers should be attentive to EPU. In addition to producing negative outcomes in actual economic activity, EPU impacts bank credit expansion, potentially restricting enterprises' access to financing in a risky and opportunistic environment. The effect of economic globalisation may be weakened by the reduced credit supply brought by the surge in EPU, even though globalisation has encouraged banks to expand credit. Policy makers should also provide policy clarity and enhance coordination and communication. In order to lessen uncertainty for banks and other economic agents, policy makers should ensure that policies are transparent, coherent, and explicit. Furthermore, promoting cooperation and communication between

policymakers and banks is also significant. As a result, there may be less ambiguity and more trust in the economic system.

5.4 Limitations and Recommendations for Future Research

In this research, the main limitation is data availability. Bank-level data was missing in Bankfocus from 2005 onwards. Therefore, incorporating a longer time period may provide a more comprehensive understanding of the effects of CG, globalisation, and EPU on bank efficiency. Future research can combine several databases such as Bankfocus and Thomson Reuters Eikon to get more data spanning longer time periods.

The second limitation concerns the method of calculating efficiency. This study used DEA for calculating the efficiency levels of both types of banks. Future research can adopt other methods of computing efficiency, such as multi-directional efficiency analysis (Asmild et al., 2019), meta-frontier technology (Abdul-Majid et al., 2017), and Malmquist meta-frontier analysis (Azad et al., 2017). These methods may yield different outcomes as they focus on heterogeneity and provide direction-specific insights.

The last limitation concerns the moderating variable. Although incorporating EPU provides insight into the mechanisms that influence the impact of CG and globalisation on bank efficiency, the association between CG and globalisation and their effect on bank efficiency may be influenced by other mechanisms. Future research could explore variables such as bank regulations (Barth et al., 2013) and macroprudential policies (Alam et al., 2019). Results from these

alternative moderating mechanisms may improve the understanding of the relationship between CG, globalisation, and bank efficiency.



REFERENCES

- Abdelhafid, M., & Mohammed, S. (2019). The Impact of information asymmetry on the bank financing of SMEs in Algeria: An econometric study. *International Journal of Inspiration & Resilience Economy*, 3(1), 17–23.
- Abdul-Majid, M., Falahaty, M., & Jusoh, M. (2017). Performance of Islamic and conventional banks: A meta-frontier approach. *Research in International Business and Finance*, 42, 1327–1335. <https://doi.org/10.1016/j.ribaf.2017.07.069>
- Abdul-Majid, M., Saal, D. S., & Battisti, G. (2010). Efficiency in Islamic and conventional banking: An international comparison. *Journal of Productivity Analysis*, 34, 25–43. <https://doi.org/10.1007/S11123-009-0165-3>
- Abuzayed, B., Ammar, M. B., Molyneux, P., & Al-Fayoumi, N. (2024). Corruption, lending and bank performance. *International Review of Economics & Finance*, 89, 802–830. <https://doi.org/10.1016/j.iref.2023.07.080>
- Adjei-Frimpong, K., Gan, C., & Hu, B. (2014). Cost efficiency of Ghana's banking industry: A panel data analysis. *The International Journal of Business and Finance Research*, 8(2), 69–86.
- Adsera, A., Boix, C., & Payne, M. (2003). Are you being served? Political accountability and quality of government. *Journal of Law, Economics, and Organization*, 19(2), 445–490. <https://doi.org/10.1093/jleo/ewg017>
- Aghion, P., Burgess, R., Redding, S., & Zilibotti, F. (2003). *The unequal effects of liberalization: Theory and evidence from India*. LSE mimeo. London, UK: LSE.
- Ahir, H., Bloom, N., & Furceri, D. (with National Bureau of Economic Research). (2022). *The World Uncertainty Index*. National Bureau of Economic Research.
- Ahmad, Z. (1994). Islamic banking: State of the art. *Islamic Economic Studies*, 2(1).
- Aigner, D. J., & Chu, S. (1968). On estimating the industry production function. *The American Economic Review*, 58(4), 826–839.
- Akbar, S. W., Ur Rehman, A., & Ijaz, M. S. (2024). The impact of corruption and Islamicity on bank stability and profitability: Assessing the moderating effect in dual banking systems. *Journal of Islamic Accounting and Business Research*.

- Akdoğan, E. C. (2018). How globalization affects the operational efficiency of emerging market firms?: A comparative analysis on Turkish SMEs. *Economics and Business Letters*, 7(1), 9–17. <https://doi.org/10.17811/eb1.7.1.2018.9-17>
- Akhigbe, A., McNulty, J. E., & Stevenson, B. A. (2013). How does transparency affect bank financial performance? *International Review of Financial Analysis*, 29, 24–30. <https://doi.org/10.1016/j.irfa.2013.01.007>
- Alam, A., Uddin, M., Yazdifar, H., Shafique, S., & Lartey, T. (2020). R&D investment, firm performance and moderating role of system and safeguard: Evidence from emerging markets. *Journal of Business Research*, 106, 94–105. <https://doi.org/10.1016/j.jbusres.2019.09.018>
- Alam, Z., Alter, M. A., Eiseman, J., Gelos, M. R., Kang, M. H., Narita, M. M., Nier, E., & Wang, N. (2019). *Digging deeper—Evidence on the effects of macroprudential policies from a new database*. International Monetary Fund.
- Albaity, M., Mallek, R. S., & Noman, A. H. Md. (2019). Competition and bank stability in the MENA region: The moderating effect of Islamic versus conventional banks. *Emerging Markets Review*, 38, 310–325. <https://doi.org/10.1016/j.ememar.2019.01.003>
- Alexakis, C., Izzeldin, M., Johnes, J., & Pappas, V. (2019). Performance and productivity in Islamic and conventional banks: Evidence from the global financial crisis. *Economic Modelling*, 79, 1–14. <https://doi.org/10.1016/j.econmod.2018.09.030>
- Aljunied, K. (2019). Islam in southeast Asia. In *Oxford Research Encyclopedia of Religion*.
- Alqahtani, F., Mayes, D. G., & Brown, K. (2017). Islamic bank efficiency compared to conventional banks during the global crisis in the GCC region. *Journal of International Financial Markets, Institutions and Money*, 51, 58–74. <https://doi.org/10.1016/j.intfin.2017.08.010>
- Alshubiri, F., Jamil, S. A., & Samia, F. (2023). Corruption Control, Government Effectiveness and Banking Stability: Does Corruption Grease or Sand the Wheels? *Journal of the Knowledge Economy*, 1–26. <https://doi.org/10.1007/s13132-023-01277-x>
- Altenburg, T., Hampel-Milagrosa, A., & Loewe, M. (2017). A decade on: How relevant is the regulatory environment for micro and small enterprise upgrading after all? *The European Journal of Development Research*, 29, 457–475. <https://doi.org/10.1057/s41287-016-0010-2>
- Arafat, Q. Y., Rashid, A., & Jan, Q. W. (2021). Impact of COVID-19 on the Performance and Stability of Conventional and Islamic Banks in the GCC Region, Malaysia, and Pakistan. *Islamic Banking and Finance Review*, 8(1), 24–37.

- Arbatli, E. C., Davis, S. J., Ito, A., & Miake, N. (2017). *Policy uncertainty in Japan*. National Bureau of Economic Research.
- Ariff, M., & Can, L. (2008). Cost and profit efficiency of Chinese banks: A non-parametric analysis. *China Economic Review*, 19(2), 260–273. <https://doi.org/10.1016/j.chieco.2007.04.001>
- Aryeetey, E., & Ahene, A. A. (2005). *Changing regulatory environment for small-medium size enterprises and their performance in Ghana*.
- Ashraf, B. N. (2018). Do trade and financial openness matter for financial development? Bank-level evidence from emerging market economies. *Research in International Business and Finance*, 44, 434–458. <https://doi.org/10.1016/j.ribaf.2017.07.115>
- Ashyrov, G., & Poltimäe, H. (2022). Does corruption hinder firm energy efficiency? Evidence from vietnam. *Evidence From Vietnam (January 4, 2022)*.
- Aslan, Ö., Aktuğ, S. S., Ozkan-Okay, M., Yilmaz, A. A., & Akin, E. (2023). A comprehensive review of cyber security vulnerabilities, threats, attacks, and solutions. *Electronics*, 12(6), 1333. <https://doi.org/10.3390/electronics12061333>
- Asmild, M., Kronborg, D., Mahbub, T., & Matthews, K. (2019). The efficiency patterns of Islamic banks during the global financial crisis: The case of Bangladesh. *The Quarterly Review of Economics and Finance*, 74, 67–74. <https://doi.org/10.1016/j.qref.2018.04.004>
- Asteriou, D., Pilbeam, K., & Tomuleasa, I. (2021). The impact of corruption, economic freedom, regulation and transparency on bank profitability and bank stability: Evidence from the Eurozone area. *Journal of Economic Behavior & Organization*, 184, 150–177. <https://doi.org/10.1016/j.jebo.2020.08.023>
- Avkiran, N. K. (1999). An application reference for data envelopment analysis in branch banking: Helping the novice researcher. *International Journal of Bank Marketing*, 17(5), 206–220. <https://doi.org/10.1108/02652329910292675>
- Ayedh, A. M., Mahyudin, W. A., Abdul Samat, M. S., & Muhamad Isa, H. H. (2021). The integration of Shariah compliance in information system of Islamic financial institutions: Qualitative evidence of Malaysia. *Qualitative Research in Financial Markets*, 13(1), 37–49. <https://doi.org/10.1108/QRFM-05-2017-0042>
- Azad, M. A. K., Munisamy, S., Masum, A. K. M., Saona, P., & Wanke, P. (2017). Bank efficiency in Malaysia: A use of malmquist meta-frontier analysis. *Eurasian Business Review*, 7, 287–311. <https://doi.org/10.1007/s40821-016-0054-4>

- Azhar Rosly, S., & Afandi Abu Bakar, M. (2003). Performance of Islamic and mainstream banks in Malaysia. *International Journal of Social Economics*, 30(12), 1249–1265. <https://doi.org/10.1108/03068290310500652>
- Baggs, J., & Brander, J. (2004). *Trade liberalization and financial leverage*. Citeseer.
- Bain, D. (1982). The productivity prescription: The manager's guide to improving productivity and profits. (*No Title*).
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4), 1593–1636. <https://doi.org/10.1093/qje/qjw024>
- Bakhouché, A., El Ghak, T., & Alshiab, M. (2022). Does Islamicity matter for the stability of Islamic banks in dual banking systems? *Heliyon*, 8(4), e09245. <https://doi.org/10.1016/j.heliyon.2022.e09245>
- Banker, R. D., Charnes, A., & Cooper, W. W. (1984). Some models for estimating technical and scale inefficiencies in data envelopment analysis. *Management Science*, 30(9), 1078–1092. <https://doi.org/10.1287/mnsc.30.9.1078>
- Barbier, E. B., & Burgess, J. C. (2021). Institutional Quality, Governance and Progress towards the SDGs. *Sustainability*, 13(21). <https://doi.org/10.3390/su132111798>
- Bardhan, P. (2017). Corruption and development: A review of issues. *Political Corruption*, 321–338. <https://doi.org/10.4324/9781315126647-30>
- Barra, C., Papaccio, A., & Ruggiero, N. (2024). The interaction between corruption, bank cost efficiency and economic development in Italy. *Economic Systems*, 101227. <https://doi.org/10.1016/j.ecosys.2024.101227>
- Barth, J. R., Caprio, G., & Levine, R. (2013). Bank regulation and supervision in 180 countries from 1999 to 2011. *Journal of Financial Economic Policy*, 5(2), 111–219. <https://doi.org/10.1108/17576381311329661>
- Barth, J. R., Lin, C., Ma, Y., Seade, J., & Song, F. M. (2013). Do bank regulation, supervision and monitoring enhance or impede bank efficiency? *Journal of Banking & Finance*, 37(8), 2879–2892. <https://doi.org/10.1016/j.jbankfin.2013.04.030>
- Bassens, D., Derudder, B., & Witlox, F. (2011). Oiling global capital accumulation: Analysing the principles, practices, and geographical distribution of Islamic financial services. *The Service Industries Journal*, 31(3), 327–341. <https://doi.org/10.1080/02642060802712830>

- Basuil, D. A., & Datta, D. K. (2019). Effects of firm-specific and country-specific advantages on relative acquisition size in service sector cross-border acquisitions: An empirical examination. *Journal of International Management*, 25(1), 66–80. <https://doi.org/10.1016/j.intman.2018.07.001>
- Bates, T. W., Kahle, K. M., & Stulz, R. M. (2009). Why do US firms hold so much more cash than they used to? *The Journal of Finance*, 64(5), 1985–2021. <https://doi.org/10.1111/j.1540-6261.2009.01492.x>
- Bayley, D. H. (1966). The effects of corruption in a developing nation. *Western Political Quarterly*, 19(4), 719–732.
- Beccalli, E. (2007). Does IT investment improve bank performance? Evidence from Europe. *Journal of Banking & Finance*, 31(7), 2205–2230. <https://doi.org/10.1016/j.jbankfin.2006.10.022>
- Beck, P. J., & Maher, M. W. (1986). A comparison of bribery and bidding in thin markets. *Economics Letters*, 20(1), 1–5.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank supervision and corruption in lending. *Journal of Monetary Economics*, 53(8), 2131–2163. <https://doi.org/10.1016/j.jmoneco.2005.10.014>
- Belasri, S., Gomes, M., & Pijourlet, G. (2020). Corporate social responsibility and bank efficiency. *Journal of Multinational Financial Management*, 54, 100612. <https://doi.org/10.1016/j.mulfin.2020.100612>
- Ben Othman, H., & Mersni, H. (2014). The use of discretionary loan loss provisions by Islamic banks and conventional banks in the Middle East region: A comparative study. *Studies in Economics and Finance*, 31(1), 106–128. <https://doi.org/10.1108/SEF-02-2013-0017>
- Benson, B. L. (1984). Rent seeking from a property rights perspective. *Southern Economic Journal*, 388–400. <https://doi.org/10.2307/1057819>
- Berger, A. N., Boubakri, N., Guedhami, O., & Li, X. (2019). Liquidity creation performance and financial stability consequences of Islamic banking: Evidence from a multinational study. *Journal of Financial Stability*, 44, 100692. <https://doi.org/10.1016/j.jfs.2019.100692>
- Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, 21(6), 849–870. [https://doi.org/10.1016/S0378-4266\(97\)00003-4](https://doi.org/10.1016/S0378-4266(97)00003-4)
- Berger, A. N., DeYoung, R., Genay, H., & Udell, G. F. (2000). Globalization of financial institutions: Evidence from cross-border banking performance. *Brookings-Wharton Papers on Financial Services*, 2000(1), 23–120. <https://doi.org/10.1353/pfs.2000.0001>

- Berger, A. N., & Humphrey, D. B. (1992). Megamergers in banking and the use of cost efficiency as an antitrust defense. *The Antitrust Bulletin*, 37(3), 541–600. <https://doi.org/10.1177/0003603X9203700302>
- Berger, A. N., & Humphrey, D. B. (1997). Efficiency of financial institutions: International survey and directions for future research. *European Journal of Operational Research*, 98(2), 175–212. [https://doi.org/10.1016/S0377-2217\(96\)00342-6](https://doi.org/10.1016/S0377-2217(96)00342-6)
- Bernanke, B. S. (2018). The real effects of disrupted credit: Evidence from the global financial crisis. *Brookings Papers on Economic Activity*, 2018(2), 251–342. <https://doi.org/10.1353/eca.2018.0012>
- Bhattacharyya, A., Lovell, C. K., & Sahay, P. (1997). The impact of liberalization on the productive efficiency of Indian commercial banks. *European Journal of Operational Research*, 98(2), 332–345. [https://doi.org/10.1016/S0377-2217\(96\)00351-7](https://doi.org/10.1016/S0377-2217(96)00351-7)
- Bilgin, M. H., Danisman, G. O., Demir, E., & Tarazi, A. (2021). Economic uncertainty and bank stability: Conventional vs. Islamic banking. *Journal of Financial Stability*, 56, 100911. <https://doi.org/10.1016/j.jfs.2021.100911>
- Boer, M., & Vazquez, J. (2017). Cyber Security & Financial Stability: How cyber-attacks could materially impact the global financial system. *Institute of International Finance*, 1.
- Böhme, R. (2010). Security metrics and security investment models. *International Workshop on Security*, 10–24.
- Bolarinwa, S. T., & Soetan, F. (2019). The effect of corruption on bank profitability. *Journal of Financial Crime*, 26(3), 753–773. <https://doi.org/10.1108/JFC-09-2018-0102>
- Bougatef, K. (2017). Determinants of bank profitability in Tunisia: Does corruption matter? *Journal of Money Laundering Control*, 20(1), 70–78. <https://doi.org/10.1108/JMLC-10-2015-0044>
- Boutchkova, M., Doshi, H., Durnev, A., & Molchanov, A. (2012). Precarious politics and return volatility. *The Review of Financial Studies*, 25(4), 1111–1154. <https://doi.org/10.1093/rfs/hhr100>
- Brogaard, J., & Detzel, A. (2015). The asset-pricing implications of government economic policy uncertainty. *Management Science*, 61(1), 3–18. <https://doi.org/10.1287/mnsc.2014.2044>
- Brusov, P., Filatova, T., Orekhova, N., Eskinarov, M., Brusov, P., Filatova, T., Orekhova, N., & Eskinarov, M. (2018). Capital Structure: Modigliani–Miller Theory. *Modern Corporate Finance, Investments, Taxation and Ratings*, 9–27.

- Burgess, T. F. (1990). A review of productivity. *Work Study*, 39(1), 6–10. <https://doi.org/10.1108/00438029010133574>
- Calomiris, C. W., & Ramirez, C. D. (1996). The role of financial relationships in the history of American corporate finance. *Journal of Applied Corporate Finance*, 9(2), 52–73. <https://doi.org/10.1111/j.1745-6622.1996.tb00115.x>
- Carrière-Swallow, Y., & Céspedes, L. F. (2013). The impact of uncertainty shocks in emerging economies. *Journal of International Economics*, 90(2), 316–325. <https://doi.org/10.1016/j.jinteco.2013.03.003>
- Caselli, M. (2012). *Trying to measure globalization: Experiences, critical issues and perspectives* (Vol. 4). Springer Science & Business Media.
- Chansarn, S. (2008). *The relative efficiency of commercial banks in Thailand: DEA approach*.
- Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the efficiency of decision making units. *European Journal of Operational Research*, 2(6), 429–444. [https://doi.org/10.1016/0377-2217\(78\)90138-8](https://doi.org/10.1016/0377-2217(78)90138-8)
- Chen, X., & Lu, C.-C. (2021). The impact of the macroeconomic factors in the bank efficiency: Evidence from the Chinese city banks. *The North American Journal of Economics and Finance*, 55, 101294. <https://doi.org/10.1016/j.najef.2020.101294>
- Cheng, X. (2019). The Impact of Economic Policy Uncertainty on the Efficiency of Corporate Working Capital Management—The Evidence from China. *Modern Economy*, 10(3), 811–827. <https://doi.org/10.4236/me.2019.103054>
- Chowdhury, M. A. M., & Haron, R. (2021). The efficiency of Islamic Banks in the Southeast Asia (SEA) region. *Future Business Journal*, 7, 1–16. <https://doi.org/10.1186/s43093-021-00062-z>
- Cobb, C. W., & Douglas, P. H. (1928). *A theory of production*.
- Cooper, W. W., Seiford, L. M., & Tone, K. (2007). *Data envelopment analysis: A comprehensive text with models, applications, references and DEA-solver software* (Vol. 2). Springer.
- Cordella, T., & Yeyati, E. L. (1998). Public disclosure and bank failures. *Staff Papers*, 45(1), 110–131. <https://doi.org/10.2307/3867331>
- Dang, V. D., & Nguyen, H. C. (2022). Bank profitability under uncertainty. *The Quarterly Review of Economics and Finance*, 83, 119–134. <https://doi.org/10.1016/j.qref.2021.12.001>
- Danisman, G. O., & Tarazi, A. (2024). Economic policy uncertainty and bank stability: Size, capital, and liquidity matter. *The Quarterly Review of*

- Das, S., Mukhopadhyay, A., & Anand, M. (2012). Stock market response to information security breach: A study using firm and attack characteristics. *Journal of Information Privacy and Security*, 8(4), 27–55. <https://doi.org/10.1080/15536548.2012.10845665>
- De Young, R. (1995). *Foreign-owned banks in the US: Earning market share or buying it?* (Vol. 95, Issue 2). Comptroller of the Currency.
- Dell'Ariccia, G., Laeven, L., & Marquez, R. (2014). Real interest rates, leverage, and bank risk-taking. *Financial Economics*, 149, 65–99. <https://doi.org/10.1016/j.jet.2013.06.002>
- Deng, W., Gao, L., Xing, F., & Yang, M. (2023). Economic policy uncertainty, bank deposits, and liability structure. *Emerging Markets Review*, 55, 101024. <https://doi.org/10.1016/j.ememar.2023.101024>
- Denizer, C. A., Dinc, M., & Tarimcilar, M. (2007). Financial liberalization and banking efficiency: Evidence from Turkey. *Journal of Productivity Analysis*, 27, 177–195. <https://doi.org/10.1007/s11123-007-0035-9>
- DeYoung, R., & Roland, K. P. (2001). Product mix and earnings volatility at commercial banks: Evidence from a degree of total leverage model. *Journal of Financial Intermediation*, 10(1), 54–84. <https://doi.org/10.1006/jfin.2000.0305>
- Dhumale, R., & Sapcanin, A. (1998). *An application of Islamic banking principles to microfinance*. World Bank New York, NY.
- Djalilov, K., & Piesse, J. (2016). Determinants of bank profitability in transition countries: What matters most? *Research in International Business and Finance*, 38, 69–82. <https://doi.org/10.1016/j.ribaf.2016.03.015>
- D'Mello, R., & Toscano, F. (2020). Economic policy uncertainty and short-term financing: The case of trade credit. *Journal of Corporate Finance*, 64, 101686. <https://doi.org/10.1016/j.jcorpfin.2020.101686>
- Do Van Anh. (2022). Does better capitalization enhance bank efficiency and limit risk taking? Evidence from ASEAN commercial banks. *Global Finance Journal*, 53, 100617. <https://doi.org/10.1016/j.gfj.2021.100617>
- Doan, A., Le, A., & Tran, Q. (2020). Economic uncertainty, ownership structure and small and medium enterprises performance. *Australian Economic Papers*, 59(2), 102–137. <https://doi.org/10.1111/1467-8454.12174>
- Doumpos, M., Hasan, I., & Pasiouras, F. (2017). Bank overall financial strength: Islamic versus conventional banks. *Economic Modelling*, 64, 513–523. <https://doi.org/10.1016/j.econmod.2017.03.026>

- Drake, L., & Hall, M. J. (2003). Efficiency in Japanese banking: An empirical analysis. *Journal of Banking & Finance*, 27(5), 891–917. [https://doi.org/10.1016/S0378-4266\(02\)00240-6](https://doi.org/10.1016/S0378-4266(02)00240-6)
- Dreher, A. (2006). Does globalization affect growth? Evidence from a new index of globalization. *Applied Economics*, 38(10), 1091–1110. <https://doi.org/10.1080/00036840500392078>
- Dungey, M., & Gajurel, D. (2015). Contagion and banking crisis—International evidence for 2007–2009. *Journal of Banking & Finance*, 60, 271–283. <https://doi.org/10.1016/j.jbankfin.2015.08.007>
- Eichengreen, B., & Gibson, H. D. (2001). Greek banking at the dawn of the new millennium. *Available at SSRN* 269391.
- El Moussawi, C., & Mansour, R. (2022). Competition, cost efficiency and stability of banks in the MENA region. *The Quarterly Review of Economics and Finance*, 84, 143–170. <https://doi.org/10.1016/j.qref.2021.12.005>
- Eling, M., & Lehmann, M. (2018). The impact of digitalization on the insurance value chain and the insurability of risks. *The Geneva Papers on Risk and Insurance-Issues and Practice*, 43, 359–396. <https://doi.org/10.1057/s41288-017-0073-0>
- Erkisi, K., & Ceyhan, T. (2019). Trade liberalization and economic growth: A panel data analysis for transition economies in Europe. *Journal of Economics Finance and Accounting*, 6(2), 82–94.
- Ewers, M. C., Dicce, R., Poon, J. P., Chow, J., & Gengler, J. (2018). Creating and sustaining Islamic financial centers: Bahrain in the wake of financial and political crises. *Urban Geography*, 39(1), 3–25. <https://doi.org/10.1080/02723638.2016.1268436>
- Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy*, 88(2), 288–307. <https://doi.org/10.1086/260866>
- Fang, J., Gozgor, G., Lau, C. K. M., & Seetaram, N. (2022). Does policy uncertainty affect economic globalization? An empirical investigation. *Applied Economics*, 54(22), 2510–2528. <https://doi.org/10.1080/00036846.2021.1998324>
- Farrell, M. J. (1957). The measurement of productive efficiency. *Journal of the Royal Statistical Society: Series A (General)*, 120(3), 253–281. <https://doi.org/10.2307/2343100>
- Fatmawati, D., Ariffin, N. M., Abidin, N. H. Z., & Osman, A. Z. (2022). Shariah governance in Islamic banks: Practices, practitioners and praxis. *Global Finance Journal*, 51, 100555. <https://doi.org/10.1016/j.gfj.2020.100555>

- Ferejohn, J. (1986). Incumbent performance and electoral control. *Public Choice*, 5–25. <https://doi.org/10.1007/BF00124924>
- Frijns, B., Indriawan, I., Tourani-Rad, A., & Zhang, H. (2023). The effect of equity market uncertainty on informational efficiency: Cross-sectional evidence. *Global Finance Journal*, 57, 100854. <https://doi.org/10.1016/j.gfj.2023.100854>
- Fu, J., & Mishra, M. (2022). Fintech in the time of COVID– 19: Technological adoption during crises. *Journal of Financial Intermediation*, 50, 100945. <https://doi.org/10.1016/j.jfi.2021.100945>
- Fu, X., Oum, T. H., & Zhang, A. (2010). Air transport liberalization and its impacts on airline competition and air passenger traffic. *Transportation Journal*, 49(4), 24–41. <https://doi.org/10.2307/40904912>
- Fukuyama, H., & Matousek, R. (2017). Modelling bank performance: A network DEA approach. *European Journal of Operational Research*, 259(2), 721–732. <https://doi.org/10.1016/j.ejor.2016.10.044>
- Gaies, B., & Jahmane, A. (2022). Corporate social responsibility, financial globalization and bank soundness in Europe–Novel evidence from a GMM panel VAR approach. *Finance Research Letters*, 47, 102772. <https://doi.org/10.1016/j.frl.2022.102772>
- Garza-García, J. G. (2012). Determinants of bank efficiency in Mexico: A two-stage analysis. *Applied Economics Letters*, 19(17), 1679–1682. <https://doi.org/10.1080/13504851.2012.665589>
- Ge, X., Liu, Y., & Zhuang, J. (2023). Monetary policy uncertainty, market structure and bank risk-taking: Evidence from China. *Finance Research Letters*, 52, 103599. <https://doi.org/10.1016/j.frl.2022.103599>
- Gee, C. S., & Abd Karim, M. Z. (2016). Financial market regulation, country governance, and bank efficiency: Evidence from East Asian countries. *Contemporary Economics*, 10(1), 39–54. <https://doi.org/10.5709/ce.1897-9254.197>
- Ghafran, C., & Yasmin, S. (2020). Ethical governance: Insight from the Islamic perspective and an empirical enquiry. *Journal of Business Ethics*, 167(3), 513–533. <https://doi.org/10.1007/s10551-019-04170-3>
- Ghosh, A. (2016). Banking sector globalization and bank performance: A comparative analysis of low income countries with emerging markets and advanced economies. *Review of Development Finance*, 6(1), 58–70. <https://doi.org/10.1016/j.rdf.2016.05.003>
- Gibson, H. D., & Tsakalotos, E. (1994). The scope and limits of financial liberalisation in developing countries: A critical survey. *The Journal of Development Studies*, 30(3), 578–628. <https://doi.org/10.1080/00220389408422329>

- Gignarta, T. S., Borojo, D. G., & Guan, Z. (2024). The impacts of economic policy uncertainties on agriculture export. *Cogent Economics & Finance*, 12(1), 2382359. <https://doi.org/10.1080/23322039.2024.2382359>
- Goel, R. K., & Hasan, I. (2011). Economy-wide corruption and bad loans in banking: International evidence. *Applied Financial Economics*, 21(7), 455–461. <https://doi.org/10.1080/09603107.2010.532112>
- Goel, S., & Shawky, H. A. (2009). Estimating the market impact of security breach announcements on firm values. *Information & Management*, 46(7), 404–410. <https://doi.org/10.1016/j.im.2009.06.005>
- Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *European Economic Review*, 35(2–3), 517–526. [https://doi.org/10.1016/0014-2921\(91\)90153-A](https://doi.org/10.1016/0014-2921(91)90153-A)
- Grossman, G. M., & Helpman, E. (1993). *Innovation and growth in the global economy*. MIT press.
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics*. McGraw-hill.
- Gulati, R., Charles, V., Hassan, M. K., & Kumar, S. (2023). COVID-19 crisis and the efficiency of Indian banks: Have they weathered the storm? *Socio-Economic Planning Sciences*, 88, 101661. <https://doi.org/10.1016/j.seps.2023.101661>
- Gulen, H., & Ion, M. (2016). Policy uncertainty and corporate investment. *The Review of Financial Studies*, 29(3), 523–564.
- Gygli, S., Haelg, F., Potrafke, N., & Sturm, J. E. (2019). *The KOF globalisation index-revisited*. *The Review of International Organizations*, 14, 543–574.
- Haddad, A., El Ammari, A., & Bouri, A. (2019). Comparative study of ambiguity resolution between the efficiency of Conventional and Islamic banks in a stable financial context. *International Journal of Economics and Financial Issues*, 9(5), 111–129. <https://doi.org/10.32479/ijefi.8623>
- Hanousek, J., Shamshur, A., & Tresl, J. (2019). Firm efficiency, foreign ownership and CEO gender in corrupt environments. *Journal of Corporate Finance*, 59, 344–360. <https://doi.org/10.1016/j.jcorpfin.2017.06.008>
- Haque, F., & Brown, K. (2017). Bank ownership, regulation and efficiency: Perspectives from the Middle East and North Africa (MENA) Region. *International Review of Economics & Finance*, 47, 273–293. <https://doi.org/10.1016/j.iref.2016.10.015>
- HAQUE, M. (2016). *Exploring product development process in Islamic banks with special reference to Islamic trade financing*. Durham University.

- Haryanto, S. (2018). Determinan Efisiensi Bank: Analisis Bank Di Indonesia. *AFRE (Accounting and Financial Review)*, 1(1). <https://doi.org/10.26905/afr.v1i1.2230>
- Hasan, M., & Dridi, J. (2010). The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study. *Microeconomics: Intertemporal Choice & Growth eJournal*, null, null. <https://doi.org/10.1142/S1793993311000270>
- Haschka, R. E., Herwartz, H., Silva Coelho, C., & Walle, Y. M. (2023). The impact of local financial development and corruption control on firm efficiency in Vietnam: Evidence from a geoaddivitive stochastic frontier analysis. *Journal of Productivity Analysis*, 60(2), 203–226. <https://doi.org/10.1007/s11123-023-00694-z>
- Hassan, T., Mohamad, S., & Khaled I. Bader, M. (2009). Efficiency of conventional versus Islamic banks: Evidence from the Middle East. *International Journal of Islamic and Middle Eastern Finance and Management*, 2(1), 46–65. <https://doi.org/10.1108/17538390910946267>
- Henry, P. B. (2007). Capital account liberalization: Theory, evidence, and speculation. *Journal of Economic Literature*, 45(4), 887–935. <https://doi.org/10.1257/jel.45.4.887>
- Hermes, N., & Nhung, V. T. H. (2010). The impact of financial liberalization on bank efficiency: Evidence from Latin America and Asia. *Applied Economics*, 42(26), 3351–3365. <https://doi.org/10.1080/00036840802112448>
- Herring, R. J., & Santomero, A. M. (1995). *The role of the financial sector in economic performance*. Wharton School, University of Pennsylvania.
- Hoang, K., Doan, H. T., Tran, T. T., Nguyen, T. X., & Le, A. Q. (2022). Anti-corruption campaign and firm financial performance: Evidence from Vietnam firms. *Evaluation Review*, 46(2), 103–137. <https://doi.org/10.1177/0193841X211072707>
- Huntington, S. P. (2006). *Political order in changing societies*. Yale university press.
- Hussain, H. I., Kamarudin, F., Mohamad, N. A., Nassir, A., Sufian, F., & Tan, K. M. (2020). *IMPACT OF COUNTRY'S GOVERNANCE DIMENSIONS ON BANK REVENUE EFFICIENCY: OVERVIEW ON MIDDLE EAST, SOUTHEAST ASIA, AND SOUTH ASIA COUNTRIES*. 19(1).
- Hussain, H. I., Szczepańska-Woszczyńska, K., Kamarudin, F., Anwar, N. A. M., & Saudi, M. H. M. (2021). Unboxing the black box on the dimensions of social globalisation and the efficiency of microfinance institutions in Asia. *Oeconomia Copernicana*, 12(3), 557–592. <https://doi.org/10.24136/oc.2021.019>

- Hussain, M., Shahmoradi, A., & Turk, R. (2016). An overview of Islamic finance. *Journal of International Commerce, Economics and Policy*, 7(01), 1650003. <https://doi.org/10.1142/S1793993316500034>
- Isik, I., & Hassan, M. K. (2003). Efficiency, ownership and market structure, corporate control and governance in the Turkish banking industry. *Journal of Business Finance & Accounting*, 30(9-10), 1363–1421. <https://doi.org/10.1111/j.0306-686X.2003.05533.x>
- Islamic Financial Service Board. (2022). Islamic Financial Service Board. *Islamic Financial Services Board*. <https://www.ifsb.org/publication-document/islamic-financial-services-industry-stability-report-2022/>
- Islamic Financial Service Board. (2023). *Islamic Financial Service Board*. https://www.ifsb.org/wp-content/uploads/2023/10/Islamic-Financial-Services-Industry-Stability-Report-2023_En.pdf
- Izzeldin, M., Johnes, J., Ongena, S., Pappas, V., & Tsionas, M. (2021). Efficiency convergence in Islamic and conventional banks. *Journal of International Financial Markets, Institutions and Money*, 70, 101279. <https://doi.org/10.1016/j.intfin.2020.101279>
- Jaffar, M., & Manarvi, I. (2011). Performance comparison of Islamic and Conventional banks in Pakistan. *Global Journal of Management and Business Research*, 11, null.
- Jain, A. K. (2001). Corruption: A review. *Journal of Economic Surveys*, 15(1), 71–121. <https://doi.org/10.1111/1467-6419.00133>
- Jens, C. E. (2017). Political uncertainty and investment: Causal evidence from US gubernatorial elections. *Journal of Financial Economics*, 124(3), 563–579. <https://doi.org/10.1016/j.jfineco.2016.01.034>
- Jiang, Y., Zhou, Z., & Liu, C. (2019). Does economic policy uncertainty matter for carbon emission? Evidence from US sector level data. *Environmental Science and Pollution Research*, 26(24), 24380–24394. <https://doi.org/10.1007/s11356-019-05627-8>
- Jin, J. L., & Wang, L. (2021). Resource complementarity, partner differences, and international joint venture performance. *Journal of Business Research*, 130, 232–246. <https://doi.org/10.1016/j.jbusres.2021.03.037>
- Johnson, K. N. (2015). Managing cyber risks. *Ga. L. Rev.*, 50, 547.
- Ju, K., Li, C., & Pan, J. (2023). Causal evidence of healthy diets, long-term PM2. 5 exposure, and kidney function decline in adults: An observational study. *Journal of Cleaner Production*, 433, 139609. <https://doi.org/10.1016/j.jclepro.2023.139609>
- Jubilee, R. V. W., Kamarudin, F., Latiff, A. R. A., Hussain, H. I., & Tan, K. M. (2021). Do Islamic versus conventional banks progress or regress in

productivity level? *Future Business Journal*, 7(1), 22.
<https://doi.org/10.1186/s43093-021-00065-w>

Kamarudin, F. (2015). *Impact of Bank-specific Characteristics, Macroeconomic Factors and Governance Islamic and Conventional Bank Revenue Efficiencies*. Universiti Putra Malaysia.

Kamarudin, F., Hue, C. Z., Sufian, F., & Mohamad Anwar, N. A. (2017). Does productivity of Islamic banks endure progress or regress? Empirical evidence using Data Envelopment Analysis based Malmquist Productivity Index. *Humanomics*, 33(1), 84–118.
<https://doi.org/10.1108/H-08-2016-0059>

Kamarudin, F., Mohamad Anwar, N. A., Md. Nassir, A., Sufian, F., Tan, K. M., & Iqbal Hussain, H. (2022a). Does country governance and bank productivity Nexus matters? *Journal of Islamic Marketing*, 13(2), 329–380. <https://doi.org/10.1108/JIMA-05-2019-0109>

Kamarudin, F., Mohamad Anwar, N. A., Md. Nassir, A., Sufian, F., Tan, K. M., & Iqbal Hussain, H. (2022b). Does country governance and bank productivity Nexus matters? *Journal of Islamic Marketing*, 13(2), 329–380. <https://doi.org/10.1108/JIMA-05-2019-0109>

Kamarudin, F., Sufian, F., & Md. Nassir, A. (2016). Does country governance foster revenue efficiency of Islamic and conventional banks in GCC countries? *EuroMed Journal of Business*, 11(2), 181–211.
<https://doi.org/10.1108/EMJB-06-2015-0026>

Kamarudin, F., Sufian, F., Nassir, A. M., Anwar, N. A. M., Ramli, N. A., Tan, K. M., & Hussain, H. I. (2018). *International Journal of Monetary Economics and Finance*, 11(4), 363–383.
<https://doi.org/10.1504/IJMEF.2018.095743>

Karkowska, R., & Pruszyńska, M. (2018). Financial Liberalization as a Determinant of Banks' Efficiency. *Bezpieczny Bank*, 73(4), 27–41.

Kaufmann, D., & Kraay, A. (2023). Worldwide Governance Indicators, 2023 Update (www. Govindicators. Org). Accessed On, 10(19), 2023.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). Governance matters VIII: aggregate and individual governance indicators, 1996-2008. *World Bank Policy Research Working Paper*, 4978.
<https://doi.org/10.1596/1813-9450-4978>

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). The worldwide governance indicators: Methodology and analytical issues. *World Bank Policy Research Working Paper*, 5430.

Keller, W., & Yeaple, S. R. (2009). Multinational enterprises, international trade, and productivity growth: Firm-level evidence from the United States. *The Review of Economics and Statistics*, 91(4), 821–831.

<https://doi.org/10.1162/rest.91.4.821>

Kennedy, P. (2008). *A guide to econometrics*. John Wiley & Sons.

Kesswani, N., & Kumar, S. (2015). Maintaining cyber security: Implications, cost and returns. *Proceedings of the 2015 ACM SIGMIS Conference on Computers and People Research*, 161–164. <https://doi.org/10.1145/2751957.2751976>

Khaleel, F., Janjua, P. Z., & Ahmed, M. (2022). Ethical consideration of Islamic banks in Pakistan: An empirical analysis. *Journal of Islamic Marketing*, 13(6), 1351–1372. <https://doi.org/10.1108/JIMA-11-2019-0231>

Khan, A., Hassan, M. K., Maroney, N., Boujlil, R., & Ozkan, B. (2020). Efficiency, diversification, and performance of US banks. *International Review of Economics & Finance*, 67, 101–117. <https://doi.org/10.1016/j.iref.2019.12.010>

Khan, I., Zahid, S. N., & Akhtar, T. (2018). Shari'ah governance and Islamic banks performance: Evidence from South Asia. *South Asian Journal of Management Sciences*, 12(2), 173–187. <https://doi.org/10.21621/sajms.2018122.04>

Kim, Y., Lee, S., & Lim, H. (2023). Uncertainty, credit and investment: Evidence from firm-bank matched data. *Journal of Banking & Finance*, 154, 106974. <https://doi.org/10.1016/j.jbankfin.2023.106974>

Koetter, M., Kolari, J. W., & Spierdijk, L. (2012). Enjoying the quiet life under deregulation? Evidence from adjusted Lerner indices for US banks. *Review of Economics and Statistics*, 94(2), 462–480. https://doi.org/10.1162/REST_a_00155

Kohers, T., Huang, M.-H., & Kohers, N. (2000). Market perception of efficiency in bank holding company mergers: The roles of the DEA and SFA models in capturing merger potential. *Review of Financial Economics*, 9(2), 101–120. [https://doi.org/10.1016/S1058-3300\(00\)00019-7](https://doi.org/10.1016/S1058-3300(00)00019-7)

Kolstad, I., & Wiig, A. (2009). Is transparency the key to reducing corruption in resource-rich countries? *World Development*, 37(3), 521–532. <https://doi.org/10.1016/j.worlddev.2008.07.002>

Kong, D., Tao, Y., & Wang, Y. (2020). China's anti-corruption campaign and firm productivity: Evidence from a quasi-natural experiment. *China Economic Review*, 63, 101535. <https://doi.org/10.1016/j.chieco.2020.101535>

Kong, Q., Li, R., Wang, Z., & Peng, D. (2022). Economic policy uncertainty and firm investment decisions: Dilemma or opportunity? *International Review of Financial Analysis*, 83, 102301. <https://doi.org/10.1016/j.irfa.2022.102301>

- Kox, H. L. (2013). Cybersecurity in the perspective of Internet traffic growth. *MPRA Paper*, 47883.
- Kpognon, K. D. (2022). Fostering domestic resources mobilization in sub-Saharan Africa: Linking natural resources and ICT infrastructure to the size of informal economy. *Resources Policy*, 77, 102757. <https://doi.org/10.1016/j.resourpol.2022.102757>
- Krech, R., Kickbusch, I., Franz, C., & Wells, N. (2018). Banking for health: The role of financial sector actors in investing in global health. *BMJ Global Health*, 3(Suppl 1), e000597. <https://doi.org/10.1136/bmjgh-2017-000597>
- Krol, R. (2018). Does uncertainty over economic policy harm trade, foreign investment, and prosperity? *Foreign Investment, and Prosperity*.
- Krueger, A. O. (2019). The experience and lessons of Asia's super exporters. In *Export-Oriented Development Strategies* (pp. 187–212). Routledge.
- Kumar, S., & Gulati, R. (2008). *An Examination of Technical, Pure Technical, and Scale Efficiencies in Indian Public Sector Banks using Data Envelopment Analysis*.
- Kuner, C. (2010). Regulation of transborder data flows under data protection and privacy law: Past, present, and future. *TILT Law & Technology Working Paper*, 016.
- Kwan, S. H. (2006). The X-efficiency of commercial banks in Hong Kong. *Journal of Banking & Finance*, 30(4), 1127–1147. <https://doi.org/10.1016/j.jbankfin.2005.05.016>
- Lalountas, D. A., Manolas, G. A., & Vavouras, I. S. (2011). Corruption, globalization and development: How are these three phenomena related? *Journal of Policy Modeling*, 33(4), 636–648. <https://doi.org/10.1016/j.jpolmod.2011.02.001>
- Lazonick, W., & O'sullivan, M. (2000). Maximizing shareholder value: A new ideology for corporate governance. *Economy and Society*, 29(1), 13–35. <https://doi.org/10.1080/030851400360541>
- Le, M., Hoang, V.-N., Wilson, C., & Ngo, T. (2020). Risk-adjusted efficiency and bank size in a developing economy: An analysis of Vietnamese banks. *Journal of Economic Studies*, 47(2), 386–404. <https://doi.org/10.1108/JES-12-2018-0425>
- Le, Q. C., Nguyen, T. P. T., & Do, T. N. (2021). State ownership, quality of sub-national governance, and total factor productivity of firms in Vietnam. *Post-Communist Economies*, 33(1), 133–146. <https://doi.org/10.1080/14631377.2020.1793608>

- Le, T. D., Ho, T. N., Nguyen, D. T., & Ngo, T. (2022). Intellectual capital–bank efficiency nexus: Evidence from an emerging market. *Cogent Economics & Finance*, 10(1), 2127485. <https://doi.org/10.1080/23322039.2022.2127485>
- Lebdaoui, H., & Wild, J. (2016). Islamic banking presence and economic growth in Southeast Asia. *International Journal of Islamic and Middle Eastern Finance and Management*, 9(4), 551–569. <https://doi.org/10.1108/IMEFM-03-2015-0037>
- Leff, N. H. (1964). Economic development through bureaucratic corruption. *American Behavioral Scientist*, 8(3), 8–14. <https://doi.org/10.1177/000276426400800303>
- Leslie, K. J., & Michaels, M. P. (1997). The real power of real options. *The McKinsey Quarterly*, 3, 4.
- Levitt, T. (1983). The globalization of markets. *Harvard Business Review*, 61, 3.
- Lewis, J. A., & Baker, S. (2013). *The economic impact of cybercrime and cyber espionage*.
- Leys, C. (1965). What is The Problem About Corruption? *The Journal of Modern African Studies*, 3(2), 215–230. <https://doi.org/10.1017/S0022278X00023636>
- Li, H., Zheng, Q., Zhang, B., & Sun, C. (2021). Trade policy uncertainty and improvement in energy efficiency: Empirical evidence from prefecture-level cities in China. *Energy Economics*, 104, 105691. <https://doi.org/10.1016/j.eneco.2021.105691>
- Li, S., & Wu, J. J. (2007). Why China thrives despite corruption. *Far Eastern Economic Review*, 170(3), 24.
- Lien, D.-H. D. (1986). A note on competitive bribery games. *Economics Letters*, 22(4), 337–341. [https://doi.org/10.1016/0165-1765\(86\)90093-5](https://doi.org/10.1016/0165-1765(86)90093-5)
- Liu, F., Sim, J., Sun, H., Edziah, B. K., Adom, P. K., & Song, S. (2023). Assessing the role of economic globalization on energy efficiency: Evidence from a global perspective. *China Economic Review*, 77, 101897. <https://doi.org/10.1016/j.chieco.2022.101897>
- Liu, P., Li, H., & Gou, H. (2020). The impact of corruption on firms' access to bank loans: Evidence from China. *Economic Research-Ekonomska Istraživanja*, 33(1), 1963–1984. <https://doi.org/10.1080/1331677X.2020.1768427>
- Liu, Z., He, S., Men, W., & Sun, H. (2024). Impact of climate risk on financial stability: Cross-country evidence. *International Review of Financial Analysis*, 92, 103096. <https://doi.org/10.1016/j.irfa.2024.103096>

- Lui, F. T. (1985). An equilibrium queuing model of bribery. *Journal of Political Economy*, 93(4), 760–781. <https://doi.org/10.1086/261329>
- Luo, H., Kamarudin, F., & Mohd Nor, N. (2023). ICT and the dual banking efficiency nexus: A cross-country analysis with country governance moderation in GCC countries. *Cogent Business & Management*, 10(3), 2275366. <https://doi.org/10.1080/23311975.2023.2275366>
- Luo, H., Kamarudin, F., & Nor, N. M. (2024). The impact of economic uncertainty on bank efficiency—The moderating role of country governance. *Heliyon*, 10(6), e27905. <https://doi.org/10.1016/j.heliyon.2024.e27905>
- Luo, J., Li, X., & Chan, K. C. (2020). Political uncertainty and labour investment efficiency. *Applied Economics*, 52(43), 4677–4697. <https://doi.org/10.1080/00036846.2020.1739615>
- Luo, Y., & Shenkar, O. (2011). Toward a perspective of cultural friction in international business. *Journal of International Management*, 17(1), 1–14.
- Maji, S. G., & Saha, R. (2023). Does intellectual capital influence banks' efficiency? Evidence from India using panel data tobit model. *Managerial Finance*.
- Manni, U. H., & Afzal, M. N. I. (2012). Effect of trade liberalization on economic growth of developing countries: A case of Bangladesh economy. *Journal of Business Economics and Finance*, 1(2), 37–44.
- Mansoor Khan, M., & Ishaq Bhatti, M. (2008). Islamic banking and finance: On its way to globalization. *Managerial Finance*, 34(10), 708–725. <https://doi.org/10.1108/03074350810891029>
- Mateev, M., Sahyouni, A., & Al Masaeid, T. (2022). Bank performance before and during the COVID-19 crisis: Does efficiency play a role? *Review of Managerial Science*. <https://doi.org/10.1007/s11846-022-00611-y>
- McNulty, J. E., Akhigbe, A. O., & Verbrugge, J. A. (2001). Small bank loan quality in a deregulated environment: The information advantage hypothesis. *Journal of Economics and Business*, 53(2–3), 325–339. [https://doi.org/10.1016/S0148-6195\(00\)00050-3](https://doi.org/10.1016/S0148-6195(00)00050-3)
- Mehmood, A., & De Luca, F. (2023). How does non-interest income affect bank credit risk? Evidence before and during the COVID-19 pandemic. *Finance Research Letters*, 53, 103657. <https://doi.org/10.1016/j.frl.2023.103657>
- Mehrez, G., & Kaufmann, D. (2000). Transparency, liberalization, and financial crisis. *Available at SSRN 258976*.

- Meltzer, J. P. (2015). The Internet, Cross-Border Data Flows and International Trade. *Asia & the Pacific Policy Studies*, 2(1), 90–102.
- Menne, F., Hasiara, L. O., Setiawan, A., Palisuri, P., Tenrigau, A. M., Waspada, W., Juliana, J., & Nurhilalia, N. (2024). Sharia accounting model in the perspective of financial innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(1), 100176. <https://doi.org/10.1016/j.joitmc.2023.100176>
- Méon, P.-G., & Weill, L. (2010). Is corruption an efficient grease? *World Development*, 38(3), 244–259. <https://doi.org/10.1016/j.worlddev.2009.06.004>
- Mertens, A., & Urga, G. (2001). Efficiency, scale and scope economies in the Ukrainian banking sector in 1998. *Emerging Markets Review*, 2(3), 292–308. [https://doi.org/10.1016/S1566-0141\(01\)00022-X](https://doi.org/10.1016/S1566-0141(01)00022-X)
- Meslier, C., Tacneng, R., & Tarazi, A. (2014). Is bank income diversification beneficial? Evidence from an emerging economy. *Journal of International Financial Markets, Institutions and Money*, 31, 97–126. <https://doi.org/10.1016/j.intfin.2014.03.007>
- Mirzaei, A., Saad, M., & Emrouznejad, A. (2022). Bank stock performance during the COVID-19 crisis: Does efficiency explain why Islamic banks fared relatively better? *Annals of Operations Research*, 1–39.
- Mishra, A. (2012). Islamic fundamentalism in South Asia: A comparative study of Pakistan and Bangladesh. *India Quarterly*, 68(3), 283–296. <https://doi.org/10.1177/0974928412454606>
- Mobarek, A., & Kalonov, A. (2014). Comparative performance analysis between conventional and Islamic banks: Empirical evidence from OIC countries. *Applied Economics*, 46(3), 253–270. <https://doi.org/10.1080/00036846.2013.839863>
- Moore, A. (2017). Measuring economic uncertainty and its effects. *Economic Record*, 93(303), 550–575. <https://doi.org/10.1111/1475-4932.12356>
- Myrdal, G. (1972). *Asian drama; an inquiry into the poverty of nations* (Vol. 1). Pantheon.
- Nailah, N., & Rusydiana, A. S. (2020). Efficiency and stability of Islamic banking in ASEAN: Dea window analysis. *Tazkia Islamic Finance and Business Review*, 14(1).
- Naisbitt, J., & Bisesi, M. (1983). Megatrends: Ten new directions transforming our lives. *Sloan Management Review (Pre-1986)*, 24(4), 69.
- Naouar, A., Boulanouar, Z., & Grassa, R. (2024). Islamic banks and capital buffer behavior: A view from the Gulf cooperation council markets. *Pacific-Basin Finance Journal*, 83, 102257.

<https://doi.org/10.1016/j.pacfin.2024.102257>

- Newburry, W., Gardberg, N. A., & Belkin, L. Y. (2006). Organizational attractiveness is in the eye of the beholder: The interaction of demographic characteristics with foreignness. *Journal of International Business Studies*, 37, 666–686. <https://doi.org/10.1057/palgrave.jibs.8400218>
- Nguyen, H. T. K., & Nguyen, D. T. (2018). Globalisation and bank performance in Vietnam. *Malaysian Journal of Economic Studies*, 55(1), 49–70. <https://doi.org/10.22452/MJES.vol55no1.3>
- Nguyen, T. C. (2021). Economic policy uncertainty and bank stability: Does bank regulation and supervision matter in major European economies? *Journal of International Financial Markets, Institutions and Money*, 74, 101387. <https://doi.org/10.1016/j.intfin.2021.101387>
- Nguyen, T. L. A. (2018). Diversification and bank efficiency in six ASEAN countries. *Global Finance Journal*, 37, 57–78. <https://doi.org/10.1016/j.gfj.2018.04.004>
- Noor, M. N. B. M., Nooh, M. N. B., & Borhan, J. T. B. (2014). The Global Hub Process: Malaysia's Vision towards Becoming the Islamic Finance Global Hub Country. *International Journal of Business and Social Science*, 5(8).
- Nordhaus, W. D. (1975). The political business cycle. *The Review of Economic Studies*, 42(2), 169–190. <https://doi.org/10.2307/2296528>
- Orudzheva, L., Salimath, M. S., & Pavur, R. (2024). Sustainable resource management and community corporate social performance: Strategic implications of corruption control in MNEs. *Society and Business Review*, 19(4), 577–602. <https://doi.org/10.1108/SBR-08-2023-0263>
- Otero, L., Razia, A., Cunill, O. M., & Mulet-Forteza, C. (2020). What determines efficiency in MENA banks? *Journal of Business Research*, 112, 331–341. <https://doi.org/10.1016/j.jbusres.2019.11.002>
- Ozili, P. K. (2017). Bank profitability and capital regulation: Evidence from listed and non-listed banks in Africa. *Journal of African Business*, 18(2), 143–168. <https://doi.org/10.1080/15228916.2017.1247329>
- Ozili, P. K., & Arun, T. G. (2023). Does economic policy uncertainty affect bank profitability? *International Journal of Managerial Finance*, 19(4), 803–830. <https://doi.org/10.1108/IJMF-04-2022-0177>
- Ozturk, E. O., & Sheng, X. S. (2018). Measuring global and country-specific uncertainty. *Journal of International Money and Finance*, 88, 276–295. <https://doi.org/10.1016/j.jimonfin.2017.07.014>

- Pagano, M. S. (2008). Credit, cronyism, and control: Evidence from the Americas. *Journal of International Money and Finance*, 27(3), 387–410. <https://doi.org/10.1016/j.jimonfin.2008.01.010>
- Pastor, J. M. (2002). Credit risk and efficiency in the European banking system: A three-stage analysis. *Applied Financial Economics*, 12(12), 895–911. <https://doi.org/10.1080/09603100110065873>
- Pastor, L., & Veronesi, P. (2012). Uncertainty about government policy and stock prices. *The Journal of Finance*, 67(4), 1219–1264. <https://doi.org/10.1111/j.1540-6261.2012.01746.x>
- Perry, P. (1992). Do banks gain or lose from inflation? *Journal of Retail Banking*, 14(2), 25–31.
- Phung, Q. T., Van Vu, H., & Tran, H. P. (2022). Do non-performing loans impact bank efficiency? *Finance Research Letters*, 46, 102393. <https://doi.org/10.1016/j.frl.2021.102393>
- Rashid, A., & Jabeen, S. (2016). Analyzing performance determinants: Conventional versus Islamic Banks in Pakistan. *Borsa Istanbul Review*, 16(2), 92–107. <https://doi.org/10.1016/j.bir.2016.03.002>
- Reiersøl, O. (1941). Confluence analysis by means of lag moments and other methods of confluence analysis. *Econometrica: Journal of the Econometric Society*, 1–24. <https://doi.org/10.2307/1907171>
- Romer, P. M. (2009). Two strategies for economic development: Using ideas and producing ideas. In *The strategic management of intellectual capital* (pp. 211–238). Routledge.
- Ronen, S., & Shenkar, O. (2013). Mapping world cultures: Cluster formation, sources and implications. *Journal of International Business Studies*, 44, 867–897. <https://doi.org/10.1057/jibs.2013.42>
- Rosman, R., Wahab, N. A., & Zainol, Z. (2014). Efficiency of Islamic banks during the financial crisis: An analysis of Middle Eastern and Asian countries. *Pacific-Basin Finance Journal*, 28, 76–90. <https://doi.org/10.1016/j.pacfin.2013.11.001>
- ROTTIG, D., & REUS, T. H. (2009). INSTITUTIONAL DISTANCE, ORGANIZATIONAL LEGITIMACY, AND THE PERFORMANCE OF FOREIGN ACQUISITIONS IN THE UNITED STATES. *Academy of Management Proceedings*, 2009(1), 1–6.
- Ruch, W. A. (1982). The measurement of white-collar productivity. *National Productivity Review*, 1(4), 416–426. <https://doi.org/10.1002/npr.4040010409>
- Safiullah, M. (2021). Stability efficiency in Islamic banks: Does board governance matter? *Journal of Behavioral and Experimental Finance*,

29, 100442. <https://doi.org/10.1016/j.jbef.2020.100442>

Salike, N., & Ao, B. (2018). Determinants of bank's profitability: Role of poor asset quality in Asia. *China Finance Review International*, 8(2), 216–231. <https://doi.org/10.1108/CFRI-10-2016-0118>

Schuh, G. E. (1988). Trade liberalization: Theory and reality. *Canadian Journal of Agricultural Economics/Revue Canadienne d'agroeconomie*, 36(4), 589–596. <https://doi.org/10.1111/j.1744-7976.1988.tb03301.x>

Sengkey, J. I., Murni, S., & Tulung, J. E. (2018). Analisis faktor–faktor yang mempengaruhi risiko likuiditas bank (Studi kasus pada bank umum swasta nasional yang terdaftar di BEI Periode 2012-2015). *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi*, 6(4).

Shabir, M., Jiang, P., Bakhsh, S., & Zhao, Z. (2021). Economic policy uncertainty and bank stability: Threshold effect of institutional quality and competition. *Pacific-Basin Finance Journal*, 68, 101610. <https://doi.org/10.1016/j.pacfin.2021.101610>

Shabir, M., Jiang, P., Hashmi, S. H., & Bakhsh, S. (2022). Non-linear nexus between economic policy uncertainty and bank lending. *International Review of Economics & Finance*, 79, 657–679. <https://doi.org/10.1016/j.iref.2022.02.016>

Shabir, M., Jiang, P., Shahab, Y., & Wang, P. (2023). Geopolitical, economic uncertainty and bank risk: Do CEO power and board strength matter? *International Review of Financial Analysis*, 87, 102603. <https://doi.org/10.1016/j.irfa.2023.102603>

Shabir, M., Jiang, P., Wang, W., & Işık, Ö. (2023). COVID-19 pandemic impact on banking sector: A cross-country analysis. *Journal of Multinational Financial Management*, 67, 100784. <https://doi.org/10.1016/j.mulfin.2023.100784>

Shahwan, T. M., & Habib, A. M. (2023). Do corporate social responsibility practices affect the relative efficiency of Egyptian conventional and Islamic banks? *International Journal of Emerging Markets*, 18(2), 439–462. <https://doi.org/10.1108/IJOEM-05-2020-0518>

Shahzad, F., Zia, A., Fareed, Z., & Zulfiqar, B. (2014). Growth of islamic banking in middle east and south asian countries. *International Journal of Management, Accounting and Economics*, 1(3), 215–228.

Sherman, H. D., & Gold, F. (1985). Bank branch operating efficiency: Evaluation with data envelopment analysis. *Journal of Banking & Finance*, 9(2), 297–315. [https://doi.org/10.1016/0378-4266\(85\)90025-1](https://doi.org/10.1016/0378-4266(85)90025-1)

Shleifer, A., & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics*, 108(3), 599–617. <https://doi.org/10.2307/2118402>

- Sohail, M. T., & Din, N. M. (2024). How do digital inclusion and energy security risks affect mineral resources trade? Evidence from world-leading mineral trading countries. *Resources Policy*, 89, 104528. <https://doi.org/10.1016/j.resourpol.2023.104528>
- Solove, D. J. (2009). *Privacy, Information, and Technology*. Aspen Publishers.
- Srairi, S. (2010). Cost and profit efficiency of conventional and Islamic banks in GCC countries. *Journal of Productivity Analysis*, 34, 45–62. <https://doi.org/10.1007/S11123-009-0161-7>
- Staikouras, C., Mamatzakis, E., & Koutsomanoli-Filippaki, A. (2008). Cost efficiency of the banking industry in the South Eastern European region. *Journal of International Financial Markets, Institutions and Money*, 18(5), 483–497. <https://doi.org/10.1016/j.intfin.2007.07.003>
- Staub, R. B., e Souza, G. da S., & Tabak, B. M. (2010). Evolution of bank efficiency in Brazil: A DEA approach. *European Journal of Operational Research*, 202(1), 204–213. <https://doi.org/10.1016/j.ejor.2009.04.025>
- Stigler, G. J. (1985). *Frank Hyneman Knight*. Working Paper.
- Sufian, F. (2007). The efficiency of Islamic banking industry in Malaysia: Foreign vs domestic banks. *Humanomics*, 23(3), 174–192. <https://doi.org/10.1108/08288660710779399>
- Sufian, F. (2009). Determinants of bank efficiency during unstable macroeconomic environment: Empirical evidence from Malaysia. *Research in International Business and Finance*, 23(1), 54–77. <https://doi.org/10.1016/j.ribaf.2008.07.002>
- Sufian, F. (2016). Financial crisis, exchange rate regimes, organizational forms, and bank efficiency: Does globalization matter? *Emerging Economy Studies*, 2(1), 27–71. <https://doi.org/10.1177/2394901515627748>
- Sufian, F., & Habibullah, M. S. (2009). Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh. *Journal of Business Economics and Management*, 10(3), 207–217.
- Sufian, F., & Habibullah, M. S. (2011). Navigating the impact of globalization on bank efficiency in China. *China & World Economy*, 19(5), 85–101. <https://doi.org/10.1111/j.1749-124X.2011.01260.x>
- Sufian, F., & Habibullah, M. S. (2012). Globalization and bank efficiency nexus: Symbiosis or parasites? *Review of Development Finance*, 2(3_4), 139–155. <https://doi.org/10.1016/j.rdf.2012.09.003>
- Sufian, F., & Habibullah, M. S. (2014). BANKS'TOTAL FACTOR PRODUCTIVITY GROWTH IN A DEVELOPING ECONOMY: DOES GLOBALISATION MATTER? *Journal of International Development*, 26(6), 821–852. <https://doi.org/10.1002/jid.2897>

- Sufian, F., & Kamarudin, F. (2012). Bank-specific and macroeconomic determinants of profitability of Bangladesh's commercial banks. *The Bangladesh Development Studies*, 1–28.
- Sufian, F., & Kamarudin, F. (2016). The impact of globalization on the performance of Banks in South Africa. *Review of International Business and Strategy*, 26(4), 517–542. <https://doi.org/10.1108/RIBS-02-2016-0003>
- Sufian, F., Kamarudin, F., & Nassir, A. M. (2017). Globalization and bank efficiency nexus: Empirical evidence from the Malaysian banking sector. *Benchmarking: An International Journal*, 24(5), 1269–1290. <https://doi.org/10.1108/BIJ-09-2014-0090>
- Tabak, B. M., Fazio, D. M., & Cajueiro, D. O. (2011). *Profit, cost and scale efficiency for Latin American banks: Concentration-performance relationship*.
- Tadesse, S. (2006). The economic value of regulated disclosure: Evidence from the banking sector. *Journal of Accounting and Public Policy*, 25(1), 32–70.
- Takahashi, F. L., & Vasconcelos, M. R. (2024). Bank efficiency and undesirable output: An analysis of non-performing loans in the Brazilian banking sector. *Finance Research Letters*, 59, 104651. <https://doi.org/10.1016/j.frl.2023.104651>
- Tamirisa, N. T., Sorsa, P., Bannister, G. J., McDonald, B., & Wieczorek, J. (2000). *Trade policy in financial services*.
- Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Journal of International Financial Markets, Institutions and Money*, 40, 85–110. <https://doi.org/10.1016/j.intfin.2015.09.003>
- Tan, Y., Floros, C., & Anchor, J. (2017). The profitability of Chinese banks: Impacts of risk, competition and efficiency. *Review of Accounting and Finance*, 16(1), 86–105. <https://doi.org/10.1108/RAF-05-2015-0072>
- Tarkom, A., & Ujah, N. U. (2023a). Global policy uncertainty and working capital management: Does national culture matter? *Technological Forecasting and Social Change*, 196, 122869. <https://doi.org/10.1016/j.techfore.2023.122869>
- Tarkom, A., & Ujah, N. U. (2023b). Inflation, interest rate, and firm efficiency: The impact of policy uncertainty. *Journal of International Money and Finance*, 131, 102799. <https://doi.org/10.1016/j.jimonfin.2022.102799>
- Trefler, D. (2004). The long and short of the Canada-US free trade agreement. *American Economic Review*, 94(4), 870–895. <https://doi.org/10.1257/0002828042002633>

- Tullock, G. (1967). THE WELFARE COSTS OF TARIFFS, MONOPOLIES, AND THEFT. *Economic Inquiry*, 5(3), 224–232. <https://doi.org/10.1111/j.1465-7295.1967.tb01923.x>
- Uddin, A., Chowdhury, M. A. F., Sajib, S. D., & Masih, M. (2020). Revisiting the impact of institutional quality on post-GFC bank risk-taking: Evidence from emerging countries. *Emerging Markets Review*, 42, 100659. <https://doi.org/10.1016/j.ememar.2019.100659>
- Uddin, Md. H., Ali, Md. H., & Hassan, M. K. (2020). Cybersecurity hazards and financial system vulnerability: A synthesis of literature. *Risk Management*, 22(4), 239–309. <https://doi.org/10.1057/s41283-020-00063-2>
- Umar, M., Maijama'a, D., & Adamu, M. (2014). Conceptual exposition of the effect of inflation on bank performance. *Journal of World Economic Research*, 3(5), 55–59. <https://doi.org/10.11648/j.jwer.20140305.11>
- VanHoose, D. (2007). Theories of bank behavior under capital regulation. *Journal of Banking & Finance*, 31(12), 3680–3697. <https://doi.org/10.1016/j.jbankfin.2007.01.015>
- Vial, V., & Hanoteau, J. (2010). Corruption, manufacturing plant growth, and the Asian paradox: Indonesian evidence. *World Development*, 38(5), 693–705.
- W Jubilee, R. V., Kamarudin, F., Abdul Latiff, A. R., Iqbal Hussain, H., & Mohamad Anwar, N. A. (2022). Does globalisation have an impact on dual banking system productivity in selected Southeast Asian banking industry? *Asia-Pacific Journal of Business Administration*, 14(4), 479–515. <https://doi.org/10.1108/APJBA-09-2020-0343>
- Wang, C.-W., Lee, C.-C., & Chen, M.-C. (2022). The effects of economic policy uncertainty and country governance on banks' liquidity creation: International evidence. *Pacific-Basin Finance Journal*, 71, 101708. <https://doi.org/10.1016/j.pacfin.2022.101708>
- Wang, Y., & Yan, Q. (2023). Is cleaner more efficient? Exploring nonlinear impacts of renewable energy deployment on regional total factor energy efficiency. *Renewable Energy*, 216, 119110. <https://doi.org/10.1016/j.renene.2023.119110>
- Wei, W., Hu, H., & Chang, C.-P. (2022). Why the same degree of economic policy uncertainty can produce different outcomes in energy efficiency? New evidence from China. *Structural Change and Economic Dynamics*, 60, 467–481. <https://doi.org/10.1016/j.strueco.2022.01.001>
- Winters, L. A., & Martuscelli, A. (2014). Trade liberalization and poverty: What have we learned in a decade? *Annu. Rev. Resour. Econ.*, 6(1), 493–512. <https://doi.org/10.1146/annurev-resource-110713-105054>

- Wooldridge, J. M. (2002). Introductory econometrics: A modern approach. *Language*, 27(863p), 24cm.
- Wu, J., Yao, Y., Chen, M., & Jeon, B. N. (2021). Does economic uncertainty affect the soundness of banks? Evidence from emerging Asian economies. *Journal of Asian Economics*, 77, 101394. <https://doi.org/10.1016/j.asieco.2021.101394>
- Xu, Z., Liu, Z., Lu, L., Liao, W., Yang, C., Duan, Z., Zhou, Q., He, W., Zhang, E., Li, N., & Ju, K. (2022). Assessing the causal effects of long-term exposure to PM2.5 during pregnancy on cognitive function in the adolescence: Evidence from a nationwide cohort in China. *Environmental Pollution*, 293, 118560. <https://doi.org/10.1016/j.envpol.2021.118560>
- Xu, Z., Tian, M., & Zhang, Y. (2024). The influence of cultural friction on foreign divestment of multinational enterprises—The moderating role of formal institutional distance and political connections. *Plos One*, 19(2), e0295443. <https://doi.org/10.1371/journal.pone.0295443>
- Yakubu, I. N. (2019). Does corruption grease or sand the wheels of bank profitability in Ghana? *Cogent Economics & Finance*, 7(1), 1701909. <https://doi.org/10.1080/23322039.2019.1701909>
- Yakubu, I. N., & Bunyaminu, A. (2022). Bank profitability in Sub-Saharan Africa: Does economic globalization matter? *Journal of Economic and Administrative Sciences*. <https://doi.org/10.1108/JEAS-08-2021-0158>
- Yao, X., Shah, W. U. H., Yasmeen, R., Zhang, Y., Kamal, M. A., & Khan, A. (2021). The impact of trade on energy efficiency in the global value chain: A simultaneous equation approach. *Science of The Total Environment*, 765, 142759. <https://doi.org/10.1016/j.scitotenv.2020.142759>
- Yu, Y., Jian, X., Wang, H., Jahanger, A., & Balsalobre-Lorente, D. (2024). Unraveling the nexus: China's economic policy uncertainty and carbon emission efficiency through advanced multivariate quantile-on-quantile regression analysis. *Energy Policy*, 188, 114057. <https://doi.org/10.1016/j.enpol.2024.114057>
- Yudaruddin, R. (2023). Government policy response to COVID-19 and bank performance: A comparison between Islamic and conventional banks. *Journal of Islamic Accounting and Business Research*, 14(6), 952–972. <https://doi.org/10.1108/JIABR-09-2022-0248>
- Yung, K., Cai, Q., & Li, D. D. (2023). Greasing the wheels of irreversible investment: International evidence on the economic effects of corruption. *Global Finance Journal*, 58, 100895. <https://doi.org/10.1016/j.gfj.2023.100895>

- Zaman, M. S., & Bhandari, A. K. (2022). Stressed assets, off-balance sheet business activities and performance of Indian banking sector: A DEA double bootstrap approach. *Studies in Economics and Finance*, 39(4), 572–592. <https://doi.org/10.1108/SEF-09-2020-0369>
- Zhang, X., & Daly, K. (2014). The impact of bank-specific and macroeconomic factors on China's bank performance. *Chinese Economy*, 47(5–6), 5–28.
- Zhou, H., Zhang, X., & Ruan, R. (2023). Firm's perception of economic policy uncertainty and corporate innovation efficiency. *Journal of Innovation & Knowledge*, 8(3), 100371.
- Zubair, M. B. (2022). *What Role Can Islamic Banks Play in Narrowing Trade Finance Gap for Small and Medium Enterprises? Is Supply Chain Finance a Potential Solution?* Hamad Bin Khalifa University (Qatar).

APPENDICES

Appendix A

KOF Globalisation Index: Variables Description

Table A1 : Structure of the KOF Globalisation Index

Dimension	Variable Name	Variable Definitions
Trade Globalisation	Trade in goods	Exports and imports of goods (% of GDP).
	Trade in services	Exports and imports of services (% of GDP).
	Trade partner diversity	Average of the Herfindahl-Hirschman market concentration index for exports and imports of goods (inverted).
	Trade regulations	Average of two subcomponents: Prevalence of non-tariff trade barriers and compliance costs of importing and exporting.
	Trade taxes	Income from taxes on international trade as percentage of revenue (inverted).
	Tariffs	Unweighted mean of tariff rates.
	Trade agreements	Number of bilateral and multilateral free trade agreements.
	Foreign direct investment	Sum of stocks of assets and liabilities of foreign direct investments (% of GDP).
Financial Globalisation	Portfolio investment	Sum of stocks of assets and liabilities of international equity portfolio investments (% of GDP).
	International debt	Sum of inward and outward stocks of international portfolio debt securities and international bank loans and deposits (% of GDP).

Table A1 : Continued

Dimension	Variable Name	Variable Definitions
Interpersonal Globalisation	International reserves	Includes foreign exchange (excluding gold), SDR holdings and reserve position in the IMF (% of GDP).
	International income payments	Sum of capital and labour income to foreign nationals and from abroad (% of GDP).
	Investment restrictions	Prevalence of foreign ownership and regulations to international capital flows.
	Capital account openness	Chinn-Ito index of capital account openness.
	International investment agreements	Number of Bilateral Investment Agreements (BITs) and Treaties with Investment Provisions (TIPs).
	International voice traffic	International incoming and outgoing fixed and mobile telephone traffic in minutes (% of population).
	Transfers	Secondary income paid and received. Gross inflows and outflows of goods, services, income or financial items without a quid pro quo (% of population).
	International tourism	Arrivals and departures of international tourists (% of population).
	International students	Inbound and outbound number of tertiary students (% of population).
	Migration	Number of foreign or foreign-born residents (% of population).
	Telephone subscriptions	Fixed telephone and mobile subscriptions (% of population).
	Freedom to visit	Percentage of countries for which a country requires a visa from foreign visitors.
	International airports	Number of airports that offers at least one international flight connection (% of population).

Table A1 : Continued

Dimension	Variable Name	Variable Definitions
Informational Globalisation	Internet bandwidth	Total used capacity of international internet bandwidth in bits per second (% of population).
	International patents	Patent applications by non residents filed through the Patent Cooperation Treaty procedure or with a national patent office (% of population).
	High technology exports	Exports of high R&D intensity products in current US\$ (% of population).
	Television access	Share of households with a television set.
	Internet access	Individuals using the internet (% of population).
	Press freedom	Quantification of the legal environment for the media, political pressure that influence reporting and economic factor that affect access to news and information.
Cultural Globalisation	Trade in cultural goods	Exports and imports of cultural goods defined as in UNESCO (2009) (% of population).
	Trade in personal services	Exports and imports of personal, cultural and recreational services (% of population).
	International trademarks	Applications to register a trademark with a national or regional Intellectual Property (IP) office by non-residents in percent of all applications.
	McDonald's restaurant	Number of McDonald's restaurants (% of population).
	IKEA stores	Number of IKEA stores (% of population)
	Gender parity	Ratio of girls to boys enrolled in primary education level in public and private schools.
	Human capital	Human capital index based on the average years of schooling and an assumed rate of return to education.
	Civil liberties	Quantification of aspects on freedom of expression and belief, associational and organisational rights, rule of law and personal autonomy and individual rights.

Appendix B

Heterogeneity Analysis: Results for Sub-Regions

There are three main emerging hubs for Islamic banking and finance: ME, SEA and SA (Hussain et al., 2020; Shahzad et al., 2014). Governments, affluent people, and certain official organisations strongly support Islamic banking and finance in the ME (Shahzad et al., 2014). Islamic banking in ME accounts for a significant proportion of global Islamic banking (Islamic Financial Service Board, 2023). SEA plays a significant role in worldwide Islamic finance due to the industry's explosive growth (Nailah & Rusydiana, 2020). In addition to having a sizable Muslim population, SA offers vast opportunities for Islamic banking (Khan et al., 2018).

Given the significance of these three hubs, it is critical to examine how IBs and CBs in various geographic areas respond to CG and globalisation and the moderating role of EPU. To address this issue, the study employed the same regression models by incorporating CG, namely (1) COC, (2) VA, and globalisation which include (1) TrG, (2) FiG, (3) IpGI, (4) InGI, (5) CuGI and the moderating effect of EPU in the three regions, namely, (1) ME, (2) SA, and (3) SEA. Table B1 summarises the conclusions drawn from sub-regions, while Tables B2 to B22 present detailed results for the ME, SA and SEA regions.

APPENDIX B-1 Middle East Region

Tables B2-B8 indicate that the panel FEM regression model is the most suitable since all chi-square (X^2) of BP LM and Hausman tests were statistically significant at 1% level in all models. Models 1-4 in Table B2

revealed that VA and COC were positively correlated with both types of banks' efficiency.

Trade globalisation and financial globalisation were found to increase CBs' efficiency while informational globalisation and cultural globalisation decreased CBs' efficiency based on the outcomes in Table B3.

The results in Table B4 indicate that trade globalisation was positively correlated with IBs' efficiency while interpersonal globalisation, informational globalisation and cultural globalisation were negatively correlated with IBs' efficiency.

Table B5 revealed that EPU strengthened the positive impact of COC on CBs' efficiency while the moderating impact of EPU on VA was not significant. In IBs, Table B6 revealed that EPU strengthened the positive impact of VA on IBs and this effect was significant at the 1% level. However, the moderating effect of EPU on COC regarding IBs was not significant.

Table B7 showed that EPU had a negative moderating impact only on the influence of trade globalisation, financial globalisation, interpersonal globalisation and informational globalisation on CBs' efficiency. However, EPU had a positive moderating effect on the impact of trade globalisation, informational globalisation and cultural globalisation on IBs' efficiency as indicated in Table B8.

APPENDIX B-2 South Asia Region

The BP LM and Hausman tests outcomes indicated that the OLS in Model 1 and Model 2, RE in Model 3 and FE in Model 4, as shown in Table B9, were the final results. COC decreased CBs' efficiency while VA increased CBs' efficiency and the results were significant at the 1% level. However, the impact of CG on IBs was not significant.

The BP LM and Hausman tests outcomes indicated that the OLS in Model 1 to Model 5 in Table B10 were the final results. Trade globalisation and financial globalisation were positively correlated with CBs' efficiency while interpersonal globalisation, informational globalisation and cultural globalisation were negatively correlated with CBs' efficiency. The above nexus was significant at 1% level.

The BP LM and Hausman tests outcomes indicated that the RE in Model 1 and FE in Model 2 to 5, as shown in Table B11, were the final results. Financial globalisation was negatively correlated with IBs' efficiency. Besides, interpersonal globalisation and cultural globalisation were positively correlated with IBs' efficiency.

The BP LM and Hausman tests outcomes indicated that the OLS in Model 1 and Model 2, as shown in Table B12, were the final results. EPU had a positive moderating impact on the COC-CB efficiency nexus but a negative moderating impact on the VA-CB efficiency nexus. The BP, LM and Hausman tests outcomes indicated that the RE in Model 1 and Model 2, as shown in Table

B13, were the final results. The moderating effect of EPU on the COC-IB efficiency nexus was not significant while the interaction ($VA \times EPU$) was negatively significant.

The BP LM and Hausman tests outcomes indicated that the OLS in Model 1, Model 3 and Model 4, as shown in Table B14, were the final results. Besides, the FE in Model 2 and Model 5 were the final results. EPU had a positive moderating effect on trade globalisation and financial globalisation' impact on CBs' efficiency and a negative moderating effect on interpersonal globalisation and cultural globalisation' impact on CBs' efficiency.

The BP LM and Hausman tests outcomes indicated that the OLS in Model 1, RE in Models 2, 3, 4 and FE in Model 5, as shown in Table B15, were the final results. EPU had a positive moderating effect on financial globalisation' impact on IBs' efficiency and this effect was significant at the 10% level. EPU had a negative moderating effect on interpersonal globalisation' impact on IBs' efficiency.

APPENDIX B-3 Southeast Asia Region

The BP LM and Hausman tests outcomes indicated that the FE model in Table B16 from Model 1 to Model 4 was the final result. According to the results, the impact of COC on both types of banks' efficiency was not significant whereas VA was negatively correlated with both types of banks' efficiency.

Based on the BP LM and Hausman tests findings, the FE model in Table B17 from Model 1 to Model 5 was the final result. Trade globalisation, financial globalisation and informational globalisation were negatively correlated with CBs' efficiency whereas interpersonal globalisation was positively correlated with CBs' efficiency.

Based on Table B18, the FE model was chosen as the final result for Model 1 to Model 5. Trade globalisation, financial globalisation and informational globalisation were negatively correlated with IBs' efficiency whereas interpersonal globalisation was positively correlated with IBs' efficiency.

The BP LM and Hausman tests in Table B19 for Model 1 and Model 2 indicated that the FE model was the appropriate choice while Table B20 indicated that the RE model was the appropriate choice. Furthermore, the moderating effect of EPU on CG concerning the efficiency of both IBs and CBs was not significant.

Based on Table B21, the FE model was chosen as the final result for Model 1 to Model 5. The moderating effect of EPU on the impact of globalisation on CBs was not significant.

Based on Table B22, the FE model was chosen as the final result for Model 1 to Model 4 while the RE model was the final result for Model 5. The moderating effect of EPU on the impact of globalisation on IBs was not significant.

Table B1: Summary of Conclusions in Sub-Regions

Conclusion		
Variable	ME	
	CBs	IBs
Country governance		
COC	+	+
VA	+	+
Globalisation		
TrGI	+	+
FiGI	+	Not sig
IpGI	Not sig	-
InGI	-	-
CuGI	-	-
Moderating effect		
COC*EPU	+	Not sig
VA*EPU	Not sig	+
TrGI*EPU	-	+
FiGI*EPU	-	+
IpGI*EPU	-	Not sig
InGI*EPU	-	Not sig
CuGI*EPU	Not sig	+
	SA	
	CBs	IBs
Country governance		
COC	-	Not sig
VA	+	Not sig
Globalisation		
TrGI	+	Not sig
FiGI	+	-
IpGI	-	+
InGI	-	Not sig
CuGI	-	+
Moderating effect		
COC*EPU	+	Not sig
VA*EPU	-	-
TrGI*EPU	+	Not sig
FiGI*EPU	+	+
IpGI*EPU	-	-
InGI*EPU	Not sig	Not sig
CuGI*EPU	-	Not sig
	SEA	
	CBs	IBs
Country governance		
COC	Not sig	Not sig
VA	-	-
Globalisation		
TrGI	-	-
FiGI	-	-
IpGI	+	+
InGI	-	-
CuGI	Not sig	Not sig
Moderating effect		
COC*EPU	Not sig	Not sig
VA*EPU	Not sig	Not sig
TrGI*EPU	Not sig	Not sig
FiGI*EPU	Not sig	Not sig
IpGI*EPU	Not sig	Not sig
InGI*EPU	Not sig	Not sig
CuGI*EPU	Not sig	Not sig

Table B2 : Regression Results of CG on Banks: Middle East

Variable	CB						IB					
	Model 1			Model 2			Model 3			Model 4		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
COC	0.020*** (0.01)	0.307*** (0.04)	0.026*** (0.01)				0.019* (0.01)	0.147*** (0.05)	0.023* (0.01)			
VA				0.077*** (0.01)	0.450*** (0.03)	0.099*** (0.02)				0.008 (0.02)	0.316*** (0.07)	0.016 (0.03)
size	-0.059*** (0.00)	-0.194*** (0.01)	-0.062*** (0.00)	-0.050*** (0.00)	-0.177*** (0.01)	-0.053*** (0.00)	-0.048*** (0.01)	-0.136*** (0.02)	-0.051*** (0.01)	-0.045*** (0.01)	-0.138*** (0.02)	-0.047*** (0.01)
capital	-0.004*** (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)	-0.002*** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)
quality	-0.001 (0.00)	-0.003** (0.00)	-0.002 (0.00)	-0.002* (0.00)	-0.004*** (0.00)	-0.002** (0.00)	-0.002* (0.00)	-0.010*** (0.00)	-0.004** (0.00)	-0.002* (0.00)	-0.011*** (0.00)	-0.004** (0.00)
CPI	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)
GDPG	0.006*** (0.00)	0.002 (0.00)	0.006*** (0.00)	0.007*** (0.00)	0.004*** (0.00)	0.007*** (0.00)	0.009*** (0.00)	0.007*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.007*** (0.00)	0.009*** (0.00)
COVID	-0.129*** (0.02)	-0.077*** (0.02)	-0.125*** (0.02)	-0.111*** (0.02)	-0.056*** (0.02)	-0.103*** (0.02)	-0.152*** (0.02)	-0.066*** (0.03)	-0.141*** (0.02)	-0.146*** (0.02)	-0.031*** (0.03)	-0.134*** (0.02)
_cons	1.927*** (0.09)	5.031*** (0.27)	2.007*** (0.09)	1.775*** (0.09)	4.900*** (0.26)	1.862*** (0.10)	1.531*** (0.15)	3.583*** (0.44)	1.602*** (0.17)	1.479*** (0.14)	3.981*** (0.44)	1.543*** (0.17)
N	2158	2158	2158	2158	2158	2158	865	865	865	865	865	865
r ²	0.291	0.353		0.300	0.386		0.321	0.314		0.319	0.325	
r ² a	0.289	0.301		0.298	0.336		0.316	0.243		0.314	0.256	
F	126.169***	155.489***		131.572***	179.091***		58.000***	51.196***		57.417***	53.947***	
BP LM	chibar2(01) = 8.11***			chibar2(01) = 10.72***			chibar2(01) = 11.29***			chibar2(01) = 11.23***		
chi2			875.628***			916.212***			378.697***			371.142***
Hausman			chi2(7) = 247.42***			chi2(7) = 302.60***			chi2(7) = 62.20***			chi2(7) = 118.78***

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B3: Regression Results of Globalisation on CBs: Middle East

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	0.001* (0.00)	0.009*** (0.00)	0.001** (0.00)												
FIGI				0.000 (0.00)	0.004*** (0.00)	0.001 (0.00)									
IpGI							0.000 (0.00)	-0.001 (0.00)	0.000 (0.00)						
InGI										-0.008** (0.00)	-0.015** (0.00)	-0.009** (0.00)			
CuGI													-0.001** (0.00)	-0.007*** (0.00)	-0.001*** (0.00)
size	-0.057** (0.00)	-0.182*** (0.01)	-0.060*** (0.00)	-0.057*** (0.00)	-0.199*** (0.01)	-0.059** (0.00)	-0.057*** (0.00)	-0.196*** (0.01)	-0.059** (0.00)	-0.055*** (0.00)	-0.097*** (0.01)	-0.057*** (0.00)	-0.056*** (0.00)	-0.175*** (0.01)	-0.057*** (0.00)
capital	-0.004** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.005*** (0.00)	-0.001 (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)
quality	-0.002* (0.00)	-0.005*** (0.00)	-0.002** (0.00)	-0.002* (0.00)	-0.004*** (0.00)	-0.002* (0.00)	-0.002* (0.00)	-0.003** (0.00)	-0.002* (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)
CPI	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
GDPG	0.007*** (0.00)	0.002 (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.003** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.003*** (0.00)	0.007*** (0.00)	0.003** (0.00)	0.001 (0.00)	0.003** (0.00)	0.006*** (0.00)	0.002 (0.00)	0.006** (0.00)
COVID	-0.123*** (0.02)	-0.049*** (0.02)	-0.118*** (0.02)	-0.124*** (0.02)	-0.086*** (0.02)	-0.121*** (0.02)	-0.123*** (0.02)	-0.084*** (0.02)	-0.119*** (0.02)	-0.105*** (0.02)	-0.054*** (0.02)	-0.098*** (0.02)	-0.121*** (0.02)	-0.089*** (0.02)	-0.117*** (0.02)
cons	1.833*** (0.09)	4.135*** (0.30)	1.890*** (0.10)	1.839*** (0.09)	4.840*** (0.28)	1.888*** (0.10)	1.875*** (0.09)	5.100*** (0.28)	1.924*** (0.09)	2.441*** (0.10)	3.823*** (0.28)	2.571*** (0.10)	1.918*** (0.09)	4.968*** (0.27)	1.977*** (0.09)
N	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158
r ²	0.290	0.344		0.289	0.333		0.289	0.329		0.329	0.384		0.291	0.345	
r ² a	0.288	0.292		0.287	0.280		0.287	0.275		0.326	0.335		0.288	0.292	
F	125.484***	149.792***		125.118***	142.659***		124.829***	139.640***		150.317***	177.998***		125.935***	150.359***	
BP LM		chibar2(01) = 7.14***			chibar2(01) = 5.92***			chibar2(01) = 5.19**			chibar2(01) = 36.56***			chibar2(01) = 7.04***	
chi2		869.160***			866.508***			864.508***			1069.396***			874.005***	
Hausman		chi2(7) = 223.81***			chi2(7) = 199.01***			chi2(7) = 189.76***			chi2(7) = 211.40***			chi2(7) = 230.68***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B4 : Regression Results of Globalisation on IBs: Middle East

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	-0.000 (0.00)	0.012*** (0.00)	-0.000 (0.00)												
FIGI				0.000 (0.00)	0.003 (0.00)	0.000 (0.00)									
IpGI							0.000 (0.00)	-0.014*** (0.00)	-0.000 (0.00)						
InGI										-0.006** (0.00)	-0.016*** (0.00)	-0.008*** (0.00)			
CuGI													-0.000 (0.00)	-0.019*** (0.00)	-0.001 (0.00)
size	-0.046*** (0.01)	-0.151*** (0.02)	-0.049*** (0.01)	-0.046*** (0.01)	-0.145*** (0.02)	-0.048*** (0.01)	-0.046*** (0.01)	-0.149*** (0.02)	-0.048*** (0.01)	-0.040*** (0.01)	-0.119*** (0.02)	-0.041*** (0.01)	-0.045*** (0.01)	-0.146*** (0.02)	-0.047*** (0.01)
capital	-0.002** (0.00)	-0.003** (0.00)	-0.002*** (0.00)	-0.002** (0.00)	-0.003** (0.00)	-0.002*** (0.00)	-0.002** (0.00)	-0.004** (0.00)	-0.002*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.002*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)
quality	-0.002 (0.00)	-0.011*** (0.00)	-0.004** (0.00)	-0.002* (0.00)	-0.010*** (0.00)	-0.003** (0.00)	-0.002 (0.00)	-0.010*** (0.00)	-0.003** (0.00)	-0.001 (0.00)	-0.005** (0.00)	-0.002 (0.00)	-0.002 (0.00)	-0.013*** (0.00)	-0.004** (0.00)
CPI	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	0.000 (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)
GDPG	0.009*** (0.00)	0.007*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.008*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.007*** (0.00)	0.009*** (0.00)	0.008*** (0.00)	0.001 (0.00)	0.007*** (0.00)	0.009*** (0.00)	0.005*** (0.00)	0.009*** (0.00)
COVID	-0.144*** (0.02)	-0.006 (0.03)	-0.133*** (0.02)	-0.150*** (0.02)	-0.066*** (0.03)	-0.139*** (0.02)	-0.146*** (0.02)	-0.105*** (0.03)	-0.134*** (0.02)	-0.120*** (0.02)	-0.089*** (0.02)	-0.112*** (0.02)	-0.142*** (0.02)	-0.056*** (0.02)	-0.127*** (0.02)
cons	1.485*** (0.14)	3.301*** (0.44)	1.550*** (0.17)	1.473*** (0.14)	3.618*** (0.45)	1.528*** (0.16)	1.481*** (0.14)	4.638*** (0.46)	1.546*** (0.17)	1.744*** (0.14)	4.203*** (0.41)	1.906*** (0.17)	1.489*** (0.14)	4.773*** (0.44)	1.569*** (0.17)
N	865	865	865	865	865	865	865	865	865	865	865	865	865	865	865
r ²	0.319	0.329	0.320	0.314	0.307	0.319	0.319	0.330	0.319	0.358	0.412	0.320	0.320	0.368	0.368
r ² a	0.314	0.260		0.314	0.236		0.314	0.260		0.353	0.351		0.314	0.302	
F	57.403***	54.846***		57.503***	49.623***		57.391***	54.990***		68.278***	78.423**		57.536***	65.038***	
BP LM		chibar2(01) = 10.93***			chibar2(01) = 10.75***			chibar2(01) = 10.94***			chibar2(01) = 35.44***			chibar2(01) = 12.20***	
chi2		370.488***			375.266***			372.457***			465.126***			370.773***	
Hausman		chi2(7) = 77.94***			chi2(7) = 57.72***			chi2(7) = 80.99***			chi2(7) = 107.60***			chi2(7) = 118.78***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B5 : Moderating Effect of EPU on the Impact of CG on CBs: Middle East

Variable	Model 1				Model 2			
	ols	fe	re		ols	fe	re	
EPU	0.032 (0.04)	-0.070 (0.05)	0.017 (0.04)		-0.099 (0.08)	-0.142* (0.08)	-0.142* (0.08)	
COC	-0.014 (0.01)	0.277*** (0.04)	-0.009 (0.01)					
COC*EPU	0.182*** (0.05)	0.119* (0.06)	0.177*** (0.06)					
VA					0.087*** (0.02)	0.454*** (0.04)	0.117*** (0.03)	
VA*EPU					0.083 (0.11)	-0.015 (0.11)	0.058 (0.11)	
size	-0.061*** (0.00)	-0.191*** (0.01)	-0.063*** (0.00)		-0.051*** (0.00)	-0.171*** (0.01)	-0.054*** (0.00)	
capital	-0.004*** (0.00)	-0.006*** (0.00)	-0.005*** (0.00)		-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)	
quality	-0.002* (0.00)	-0.003** (0.00)	-0.002* (0.00)		-0.002* (0.00)	-0.004*** (0.00)	-0.002* (0.00)	
CPI	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)		-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	
GDPG	0.006*** (0.00)	0.002 (0.00)	0.006*** (0.00)		0.007*** (0.00)	0.004*** (0.00)	0.007*** (0.00)	
COVID	-0.132*** (0.02)	-0.079*** (0.02)	-0.130*** (0.02)		-0.116*** (0.02)	-0.059*** (0.02)	-0.108*** (0.02)	
_cons	1.973*** (0.09)	4.982*** (0.27)	2.044*** (0.09)		1.814*** (0.09)	4.799*** (0.26)	1.916*** (0.10)	
N	2158	2158	2158		2158	2158	2158	
r ²	0.295	0.358			0.307	0.390		
r ² _a	0.293	0.306			0.304	0.340		
F	100.093***	123.621***			105.506***	141.592***		
BP LM		chibar2(01) = 8.55***				chibar2(01) = 19.35***		
chi2		chibar2(9) = 254.87***					954.553***	
Hausman		894.710***					chibar2(9) = 292.20***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B6: Moderating Effect of EPU on the Impact of CG on IBs: Middle East

Variable	Model 1				Model 2			
	ols	fe	re		ols	fe	re	
EPU	-0.307*** (0.07)	-0.254*** (0.09)	-0.301*** (0.08)		0.017 (0.16)	0.395* (0.20)	0.061 (0.16)	
COC	0.013 (0.02)	0.179*** (0.05)	0.016 (0.02)					
COC*EPU	0.045 (0.10)	0.039 (0.12)	0.040 (0.10)					
VA					-0.019 (0.03)	0.360*** (0.08)	-0.017 (0.03)	
VA*EPU					0.407** (0.16)	0.808*** (0.18)	0.435*** (0.16)	
size	-0.050*** (0.01)	-0.139*** (0.02)	-0.051*** (0.01)		-0.044*** (0.01)	-0.144*** (0.02)	-0.045*** (0.01)	
capital	-0.002*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)		-0.002*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	
quality	-0.002* (0.00)	-0.009*** (0.00)	-0.003*** (0.00)		-0.002 (0.00)	-0.009*** (0.00)	-0.003* (0.00)	
CPI	-0.000*** (0.00)	-0.000* (0.00)	-0.000*** (0.00)		-0.000*** (0.00)	-0.000* (0.00)	-0.000*** (0.00)	
GDPG	0.008*** (0.00)	0.006*** (0.00)	0.008*** (0.00)		0.008*** (0.00)	0.005*** (0.00)	0.008*** (0.00)	
COVID	-0.157*** (0.02)	-0.076*** (0.03)	-0.152*** (0.02)		-0.157*** (0.02)	-0.037 (0.03)	-0.150*** (0.02)	
_cons	1.603*** (0.15)	3.678*** (0.44)	1.636*** (0.15)		1.463*** (0.15)	4.211*** (0.43)	1.501*** (0.16)	
N	865	865	865		865	865	865	
r ²	0.339	0.324			0.344	0.364		
r ² _a	0.332	0.252			0.337	0.296		
F	48.743***	41.514***			49.810***	49.596***		
BP LM		chi2(9) = 6.41***				chi2(9) = 7.64***		
chi2			894.710***				423.473***	
Hausman		chi2(9) = 68.00***					chi2(8) = 100.61***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B7: Moderating Effect of EPU on the Impact of Globalisation on CBs: Middle East

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	0.956*** (0.20)	1.188*** (0.22)	1.040*** (0.21)	0.723*** (0.17)	0.976*** (0.19)	0.776*** (0.17)	1.529*** (0.32)	1.817*** (0.35)	1.629*** (0.32)	2.119*** (0.37)	1.823*** (0.36)	2.083*** (0.37)	0.369** (0.18)	0.058 (0.20)	0.390** (0.19)
TGI	0.004*** (0.00)	0.012*** (0.00)	0.004*** (0.00)												
TGI*EPU	-0.016*** (0.00)	-0.021*** (0.00)	-0.017*** (0.00)												
FIGI				0.003*** (0.00)	0.007*** (0.00)	0.003*** (0.00)									
FIGI*EPU				-0.013*** (0.00)	-0.018*** (0.00)	-0.014*** (0.00)									
IpGI							0.004*** (0.00)	0.003 (0.00)	0.004*** (0.00)						
IpGI*EPU							-0.027*** (0.01)	-0.033*** (0.01)	-0.029*** (0.01)						
InGI										-0.003*** (0.00)	-0.011*** (0.00)	-0.004*** (0.00)			
InGI*EPU										-0.028*** (0.00)	-0.025*** (0.00)	-0.028*** (0.00)			
CuGI													0.000 (0.00)	-0.007*** (0.00)	0.000 (0.00)
CuGI*EPU													-0.007*** (0.00)	-0.003 (0.00)	-0.008*** (0.00)
size	-0.060*** (0.00)	-0.178*** (0.01)	-0.064*** (0.00)	-0.058*** (0.00)	-0.193*** (0.01)	-0.062*** (0.00)	-0.058*** (0.00)	-0.184*** (0.01)	-0.061*** (0.00)	-0.055*** (0.00)	-0.089*** (0.01)	-0.056*** (0.00)	-0.056*** (0.00)	-0.165*** (0.01)	-0.057*** (0.00)
capital	-0.004*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.006*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.001 (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)
quality	-0.001 (0.00)	-0.005*** (0.00)	-0.002 (0.00)	-0.001 (0.00)	-0.004*** (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.003 (0.00)	-0.001 (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)
CPI	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)	-0.001*** (0.00)
GDPG	0.007*** (0.00)	0.003*** (0.00)	0.007*** (0.00)	0.006*** (0.00)	0.004*** (0.00)	0.006*** (0.00)	0.006*** (0.00)	0.004*** (0.00)	0.006*** (0.00)	0.003*** (0.00)	0.001 (0.00)	0.002*** (0.00)	0.007*** (0.00)	0.002*** (0.00)	0.006*** (0.00)
COVID	-0.119*** (0.02)	-0.040*** (0.02)	-0.112*** (0.02)	-0.128*** (0.02)	-0.085*** (0.02)	-0.124*** (0.02)	-0.129*** (0.02)	-0.088*** (0.02)	-0.125*** (0.02)	-0.110*** (0.02)	-0.059*** (0.02)	-0.105*** (0.02)	-0.127*** (0.02)	-0.093*** (0.02)	-0.124*** (0.02)
cons	1.723*** (0.09)	3.856*** (0.30)	1.787*** (0.10)	1.750*** (0.10)	4.531*** (0.28)	1.808*** (0.10)	1.695*** (0.10)	4.614*** (0.29)	1.749*** (0.11)	2.109*** (0.11)	3.374*** (0.29)	2.224*** (0.12)	1.856*** (0.10)	4.761*** (0.29)	1.913*** (0.10)
N	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158	2158
r2	0.299	0.359		0.298	0.348		0.298	0.343		0.339	0.393		0.294	0.350	
r2 a	0.296	0.307		0.295	0.295		0.295	0.289		0.336	0.343		0.291	0.297	
F	101.866***	124.247***		101.224***	118.309***		101.487***	115.609***		122.302***	143.462***		99.360***	119.277***	
BP LM		chibar2(01) = 16.68**			chibar2(01) = 14.25***			chibar2(01) = 13.56***			chibar2(01) = 35.94***			chibar2(01) = 12.45***	
chi2		916.923***			chi2(9) = 211.33***			chi2(9) = 201.09***			chi2(9) = 210.59***			chi2(9) = 234.08***	
Hausman		chi2(9) = 233.76***			chi2(9) = 211.33***			chi2(9) = 201.09***			chi2(9) = 210.59***			chi2(9) = 234.08***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B8 : Moderating Effect of EPU on the Impact of Globalisation on IBs: Middle East

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	-0.655*** (0.19)	-0.542*** (0.19)	-0.649*** (0.19)	-0.527*** (0.20)	-0.619*** (0.22)	-0.524*** (0.20)	-0.279 (0.44)	0.352 (0.47)	-0.221 (0.44)	-0.431 (0.66)	0.684 (0.67)	-0.146 (0.66)	-0.872*** (0.27)	-0.687*** (0.27)	-0.858*** (0.27)
TrGI	-0.001 (0.00)	0.009*** (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)									
TrGI*EPU	0.006* (0.00)	0.008** (0.00)	0.006* (0.00)												
FIGI				-0.000 (0.00)	-0.001 (0.00)	-0.000 (0.00)									
FIGI*EPU				0.004 (0.00)	0.009** (0.00)	0.004 (0.00)									
IpGI							0.000 (0.00)	-0.013*** (0.00)	0.000 (0.00)						
IpGI*EPU							-0.001 (0.01)	-0.009 (0.01)	-0.002 (0.01)						
InGI										-0.005** (0.00)	-0.015** (0.00)	-0.006** (0.00)			
InGI*EPU										0.002 (0.01)	-0.008 (0.01)	-0.001 (0.01)			
CuGI													-0.002** (0.00)	-0.019** (0.00)	-0.002** (0.00)
CuGI*EPU													0.010** (0.00)	0.011** (0.01)	0.010** (0.00)
size	-0.047*** (0.01)	-0.156*** (0.02)	-0.049*** (0.01)	-0.047*** (0.01)	-0.149*** (0.02)	-0.049*** (0.01)	-0.047*** (0.01)	-0.148*** (0.02)	-0.048*** (0.01)	-0.041*** (0.01)	-0.115*** (0.02)	-0.042*** (0.01)	-0.047*** (0.01)	-0.151*** (0.02)	-0.048*** (0.01)
capital	-0.003*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.005*** (0.00)	-0.003*** (0.00)
quality	-0.002 (0.00)	-0.010*** (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.009*** (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.009*** (0.00)	-0.003 (0.00)	-0.001 (0.00)	-0.005*** (0.00)	-0.002 (0.00)	-0.002 (0.00)	-0.012*** (0.00)	-0.003 (0.00)
CPI	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	0.000 (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)	-0.000*** (0.00)
GDPG	0.009** (0.00)	0.007*** (0.00)	0.009** (0.00)	0.009** (0.00)	0.007*** (0.00)	0.009** (0.00)	0.009** (0.00)	0.007*** (0.00)	0.009** (0.00)	0.008** (0.00)	0.001 (0.00)	0.007*** (0.00)	0.008** (0.00)	0.005*** (0.00)	0.009** (0.00)
COVID	-0.158*** (0.02)	-0.030 (0.03)	-0.153*** (0.02)	-0.155*** (0.02)	-0.077*** (0.03)	-0.151*** (0.02)	-0.149*** (0.02)	-0.109*** (0.03)	-0.144*** (0.02)	-0.125*** (0.02)	-0.086*** (0.02)	-0.119*** (0.02)	-0.151*** (0.02)	-0.063*** (0.02)	-0.144*** (0.02)
cons	1.602** (0.14)	3.568*** (0.45)	1.638** (0.16)	1.578** (0.15)	3.943*** (0.46)	1.608** (0.16)	1.546** (0.15)	4.568*** (0.47)	1.575** (0.16)	1.792** (0.16)	4.078*** (0.42)	1.867** (0.18)	1.628** (0.15)	4.920*** (0.44)	1.668** (0.16)
N	865	865	865	865	865	865	865	865	865	865	865	865	865	865	865
r2	0.340	0.336		0.338	0.316		0.337	0.333		0.368	0.413		0.341	0.373	
r2 a	0.333	0.265			0.243		0.330	0.262		0.361	0.351		0.334	0.306	
F	48.833***	43.911***		48.437***	40.032***		48.216***	43.315***		55.323***	61.152***		49.083***	51.633***	
BP LM		chibar2(01) = 6.29**			chibar2(01) = 6.17***			chibar2(01) = 6.19**			chibar2(01) = 22.67***			chibar2(01) = 6.66***	
chi2		chi2(9) = 77.94***			chi2(9) = 58.95***			chi2(9) = 78.43***			chi2(9) = 118.70***			chi2(9) = 122.65***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B9: Regression Results of CG on Banks: South Aisa

Variable	CB				IB							
	Model 1				Model 2				Model 3			
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
COC	-0.137** (0.06)	-0.086 (0.07)	-0.134** (0.06)				-0.058 (0.22)	-0.405* (0.22)	-0.272 (0.21)			
VA				0.172*** (0.04)	0.152** (0.06)	0.172*** (0.04)				-0.253* (0.14)	0.234 (0.19)	-0.138 (0.15)
size	-0.053*** (0.01)	-0.054*** (0.02)	-0.053*** (0.01)	-0.051*** (0.01)	-0.046** (0.02)	-0.051*** (0.01)	-0.109*** (0.01)	-0.084** (0.03)	-0.100*** (0.02)	-0.112*** (0.01)	-0.086** (0.03)	-0.108*** (0.01)
capital	0.002 (0.00)	-0.001 (0.00)	0.001 (0.00)	0.002 (0.00)	-0.001 (0.00)	0.001 (0.00)	-0.006*** (0.00)	-0.006 (0.00)	-0.005 (0.00)	-0.007*** (0.00)	-0.007* (0.00)	-0.006** (0.00)
quality	0.002 (0.00)	0.001 (0.00)	0.002 (0.00)	0.003** (0.00)	0.002 (0.00)	0.003** (0.00)	-0.003 (0.00)	0.008 (0.01)	0.001 (0.00)	-0.004 (0.00)	0.005 (0.01)	-0.002 (0.00)
CPI	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)
GDPG	-0.000 (0.00)	-0.009** (0.00)	-0.001 (0.00)	-0.005 (0.00)	-0.008* (0.00)	-0.005 (0.00)	-0.014 (0.01)	0.003 (0.01)	-0.002 (0.01)	-0.008 (0.01)	-0.001 (0.01)	-0.007 (0.01)
COVID	0.028 (0.03)	0.021 (0.03)	0.027 (0.03)	0.056** (0.03)	0.052* (0.03)	0.056** (0.03)	-0.032 (0.07)	-0.022 (0.07)	-0.024 (0.07)	-0.043 (0.07)	0.027 (0.07)	-0.029 (0.07)
cons	1.987*** (0.17)	2.165*** (0.43)	2.002*** (0.18)	2.203*** (0.14)	2.183*** (0.40)	2.212*** (0.15)	3.255*** (0.40)	2.300*** (0.75)	2.758*** (0.50)	3.199*** (0.28)	3.035*** (0.67)	3.180*** (0.32)
N	919	919	919	919	919	919	135	135	135	135	135	135
r2	0.500	0.493		0.507	0.496		0.603	0.446		0.612	0.437	
r2_a	0.496	0.448		0.503	0.451		0.581	0.366		0.591	0.355	
F	130.164***	116.944***		133.757***	118.288***		27.536***	13.460***		28.605***	12.971***	
BP LM	chibar2(01) =0.64				chibar2(01) =0.30				chibar2(01) =10.90***			
chi2	901.808***				925.819***				124.149***			
Hausman	chi2(7) =18.67***				chi2(7) =12.94*				chi2(7) =7.72			

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B10 : Regression Results of Globalisation on CBs: South Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	-0.004* (0.00)	-0.000 (0.00)	-0.004 (0.00)												
FIGI				-0.014*** (0.00)	-0.018*** (0.00)	-0.015*** (0.00)									
IpGI							0.007*** (0.00)	0.011*** (0.00)	0.008*** (0.00)						
InGI										0.004** (0.00)	0.006** (0.00)	0.004** (0.00)			
CuGI													0.021*** (0.00)	0.051*** (0.01)	0.023*** (0.00)
size	-0.054*** (0.01)	-0.060*** (0.02)	-0.054*** (0.01)	-0.048*** (0.01)	-0.028 (0.02)	-0.048*** (0.01)	-0.055*** (0.01)	-0.082*** (0.02)	-0.055*** (0.01)	-0.058*** (0.01)	-0.079*** (0.02)	-0.058*** (0.01)	-0.051*** (0.01)	-0.058*** (0.02)	-0.051*** (0.01)
capital	0.001 (0.00)	-0.001 (0.00)	0.001 (0.00)	0.002* (0.00)	-0.000 (0.00)	0.002 (0.00)	0.001 (0.00)	-0.003* (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002 (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002 (0.00)	0.001 (0.00)
quality	0.002* (0.00)	0.001 (0.00)	0.002 (0.00)	0.004*** (0.00)	0.001 (0.00)	0.004*** (0.00)	0.004*** (0.00)	0.001 (0.00)	0.004*** (0.00)	0.002 (0.00)	0.001 (0.00)	0.002 (0.00)	0.004*** (0.00)	0.001 (0.00)	0.004*** (0.00)
CPI	-0.005*** (0.00)	-0.004*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.006*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)
GDPG	-0.002 (0.00)	-0.010** (0.00)	-0.003 (0.00)	-0.008** (0.00)	-0.006 (0.00)	-0.008** (0.00)	-0.009** (0.00)	-0.004 (0.00)	-0.008** (0.00)	0.004 (0.00)	-0.005 (0.00)	0.003 (0.00)	-0.009** (0.00)	0.005 (0.00)	-0.009** (0.00)
COVID	0.044* (0.03)	0.029 (0.03)	0.043* (0.03)	0.053** (0.03)	0.073*** (0.03)	0.055** (0.02)	0.067*** (0.03)	0.096*** (0.03)	0.068*** (0.03)	0.076*** (0.03)	0.064** (0.03)	0.075** (0.03)	0.057** (0.03)	0.130*** (0.03)	0.061** (0.03)
cons	2.345*** (0.17)	2.385*** (0.41)	2.347*** (0.18)	2.618*** (0.15)	2.425*** (0.39)	2.638*** (0.16)	2.001*** (0.14)	2.491*** (0.39)	2.015** (0.15)	2.094*** (0.15)	2.590*** (0.41)	2.109*** (0.15)	1.447*** (0.17)	0.652 (0.44)	1.418*** (0.19)
N	919	919	919	919	919	919	919	919	919	919	919	919	919	919	919
r2	0.499	0.492		0.525	0.520		0.517	0.508		0.500	0.496		0.524	0.529	
r2 a	0.495	0.447		0.521	0.477		0.514	0.464		0.496	0.451		0.520	0.487	
F	129.699***	116.512***		143.608***	130.207***		139.432***	124.317***		130.193***	118.285***		143.146***	135.042***	
BP LM		chibar2(01) = 0.54			chibar2(01) = 1.48			chibar2(01) = 0.28			chibar2(01) = 0.90			chibar2(01) = 1.20	
chi2		899.189***			chibar2(01) = 19.17***			chibar2(01) = 13.85*			chibar2(01) = 25.75***			chibar2(01) = 34.18***	
Hausman															

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B11: Regression Results of Globalisation on IBs: South Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	0.007 (0.01)	-0.010 (0.01)	-0.004 (0.01)												
FIGI				0.007 (0.01)	-0.022** (0.01)	-0.002 (0.01)									
IpGI							-0.008** (0.00)	0.037*** (0.01)	0.001 (0.01)						
lnGI										0.008 (0.01)	0.006 (0.01)	0.006 (0.01)			
CuGI													-0.012 (0.01)	0.056*** (0.02)	0.013 (0.01)
size	-0.110*** (0.01)	-0.095*** (0.03)	-0.103*** (0.02)	-0.112*** (0.01)	-0.068*** (0.04)	-0.105*** (0.02)	-0.112*** (0.01)	-0.093*** (0.03)	-0.103*** (0.02)	-0.111*** (0.01)	-0.096*** (0.04)	-0.108*** (0.01)	-0.112*** (0.01)	-0.079*** (0.03)	-0.100*** (0.02)
capital	-0.006*** (0.00)	-0.007*** (0.00)	-0.005*** (0.00)	-0.007*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.007*** (0.00)	-0.009*** (0.00)	-0.005*** (0.00)	-0.006*** (0.00)	-0.008*** (0.00)	-0.006*** (0.00)	-0.007*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)
quality	-0.004 (0.00)	0.005 (0.01)	-0.000 (0.00)	-0.004 (0.00)	0.009 (0.01)	-0.002 (0.00)	-0.003 (0.00)	0.006 (0.01)	0.000 (0.00)	-0.004 (0.00)	0.006 (0.01)	-0.002 (0.00)	-0.004 (0.00)	0.010* (0.01)	0.001 (0.00)
CPI	-0.003*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)	-0.006*** (0.00)	-0.004*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)
GDPG	-0.011 (0.01)	-0.001 (0.01)	-0.005 (0.01)	-0.011 (0.01)	-0.002 (0.01)	-0.009 (0.01)	-0.006 (0.01)	0.006 (0.01)	-0.004 (0.01)	-0.010 (0.01)	0.002 (0.01)	-0.005 (0.01)	-0.010 (0.01)	0.009 (0.01)	-0.004 (0.01)
COVID	-0.038 (0.07)	0.022 (0.07)	-0.001 (0.07)	-0.039 (0.07)	0.056 (0.07)	-0.014 (0.07)	-0.032 (0.07)	0.130* (0.07)	-0.006 (0.07)	0.015 (0.08)	0.032 (0.08)	0.014 (0.08)	-0.030 (0.07)	0.077 (0.07)	0.006 (0.07)
cons	3.021*** (0.45)	3.464*** (0.83)	3.321*** (0.56)	3.111*** (0.36)	3.354*** (0.67)	3.285*** (0.40)	3.637*** (0.30)	1.907*** (0.71)	3.132*** (0.45)	3.058*** (0.39)	2.791*** (0.70)	3.047*** (0.41)	3.778*** (0.42)	0.886 (0.86)	2.648*** (0.60)
N	135	135	135	135	135	135	135	135	135	135	135	135	135	135	135
r2	0.605	0.435		0.605	0.458		0.616	0.480		0.606	0.433		0.608	0.485	
r2 a	0.583	0.352		0.584	0.379		0.595	0.405		0.584	0.350		0.587	0.410	
F	27.784**	12.843**		27.842**	14.121**		29.137**	15.458**		27.865**	12.742**		28.175**	15.729**	
BP LM	chibar2(01) =6.80***			chibar2(01) =4.69**			chibar2(01) =1.78*			chibar2(01) =8.37***			chibar2(01) =3.40**		
chi2	121.325***			149.713***			119.468**			153.325**			121.210***		
Hausman	chi2(7) =6.66			chi2(7) =18.50***			chi2(7) =16.19**			chi2(7) =13.44*			chi2(7) =15.83*		

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B12: Moderating Effect of EPU on the Impact of CG on CBs: South Aisa

Variable	Model 1			Model 2		
	ols	fe	re	ols	fe	re
EPU	3.250*** (0.62)	3.188*** (0.63)	3.229*** (0.62)	-2.157*** (0.40)	-2.272*** (0.41)	-2.155*** (0.39)
COC	-0.584*** (0.10)	-0.516*** (0.11)	-0.576*** (0.10)			
COC*EPU	3.276*** (0.60)	3.182*** (0.61)	3.253*** (0.60)			
VA				0.373*** (0.06)	0.323*** (0.07)	0.371*** (0.06)
VA*EPU				-3.296*** (0.60)	-3.504*** (0.61)	-3.296*** (0.60)
size	-0.057*** (0.01)	-0.070*** (0.02)	-0.057*** (0.01)	-0.054*** (0.01)	-0.069*** (0.02)	-0.055*** (0.01)
capital	0.001 (0.00)	-0.002 (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002 (0.00)	0.001 (0.00)
quality	0.002* (0.00)	0.001 (0.00)	0.002 (0.00)	0.003** (0.00)	0.001 (0.00)	0.003* (0.00)
CPI	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)	-0.004*** (0.00)
GDPG	0.001 (0.00)	-0.006 (0.00)	0.000 (0.00)	-0.002 (0.00)	-0.007 (0.00)	-0.002 (0.00)
COVID	0.019 (0.03)	0.010 (0.03)	0.018 (0.03)	0.029 (0.03)	0.009 (0.03)	0.028 (0.03)
_cons	1.628*** (0.18)	2.061*** (0.43)	1.657*** (0.19)	2.416*** (0.15)	2.766*** (0.42)	2.437*** (0.16)
N	919	919	919	919	919	919
r ²	0.517	0.509		0.523	0.514	
r ² _a	0.512	0.464		0.518	0.470	
F	107.926***	96.782***		110.596***	98.976***	
BP LM		chibar2(01) = 0.45			chibar2(01) = 0.42	
chi2			958.806***			980.740***
Hausman		chi2(9) = 16.21				chi2(9) = 18.80**

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B13: Moderating Effect of EPU on the Impact of CG on IBs: South Aisa

Variable	Model 1			Model 2		
	ols	fe	re	ols	fe	re
EPU	-2.016 (2.94)	-1.292 (2.75)	-1.731 (2.73)	-5.014*** (1.66)	-4.969** (1.59)	-4.970*** (1.55)
COC	0.146 (0.34)	-0.253 (0.33)	-0.094 (0.32)			
COC*EPU	-2.270 (3.09)	-1.551 (2.89)	-1.988 (2.87)			
VA				0.243 (0.21)	0.692*** (0.23)	0.537** (0.22)
VA*EPU				-7.260*** (2.29)	-7.265*** (2.19)	-7.246*** (2.13)
size	-0.108*** (0.01)	-0.081** (0.03)	-0.098** (0.02)	-0.114*** (0.01)	-0.108** (0.03)	-0.109*** (0.02)
capital	-0.006*** (0.00)	-0.005 (0.00)	-0.004 (0.00)	-0.007*** (0.00)	-0.007* (0.00)	-0.005* (0.00)
quality	-0.003 (0.00)	0.008 (0.01)	0.001 (0.00)	-0.004 (0.00)	0.005 (0.01)	0.000 (0.00)
CPI	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.003*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)
GDPG	-0.013 (0.01)	0.003 (0.01)	-0.002 (0.01)	-0.004 (0.01)	0.003 (0.01)	-0.000 (0.01)
COVID	-0.036 (0.07)	-0.031 (0.07)	-0.030 (0.07)	-0.085 (0.07)	-0.026 (0.07)	-0.048 (0.07)
_cons	3.416*** (0.46)	2.358*** (0.77)	2.868*** (0.55)	3.537*** (0.30)	3.702*** (0.69)	3.579*** (0.45)
N	135	135	135	135	135	135
r2	0.605	0.449		0.642	0.489	
r2 a	0.577	0.358		0.616	0.405	
F	21.280***	10.419***		24.875***	12.227***	
BP LM	chibar2(01) = 11.15***			chibar2(01) = 3.82**		
chi2			122.222***			134.750***
Hausman		chi2(8) = 7.67			chi2(8) = 7.53	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B14 : Moderating Effect of EPU on the Impact of Globalisation on CBs: South Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	-2.252** (0.01)	-0.840 (1.10)	-2.216** (1.01)	-3.761*** (0.92)	-4.062*** (0.91)	-3.804*** (0.91)	1.135** (0.51)	3.040*** (0.66)	1.218** (0.51)	0.218 (0.72)	-0.147 (0.71)	0.211 (0.71)	7.793*** (2.03)	6.882*** (1.98)	7.737*** (2.01)
TrGI	-0.011** (0.00)	-0.003 (0.00)	-0.011** (0.00)												
TrGI*EPU	0.065** (0.03)	0.024 (0.03)	0.064** (0.03)	-0.023** (0.00)	-0.029** (0.00)	-0.023** (0.00)									
FIGI				0.115*** (0.03)	0.126** (0.03)	0.116** (0.03)									
FIGI*EPU															
IpGI							0.010*** (0.00)	0.026** (0.00)	0.011*** (0.00)						
IpGI*EPU							-0.030** (0.01)	-0.079** (0.02)	-0.033** (0.01)						
InGI										0.006 (0.00)	0.005 (0.00)	0.006 (0.00)			
InGI*EPU										-0.005 (0.01)	0.003 (0.01)	-0.005 (0.01)			
CuGI													0.036*** (0.00)	0.063*** (0.00)	0.037*** (0.00)
CuGI*EPU													-0.234*** (0.06)	-0.208*** (0.06)	-0.232*** (0.06)
size	-0.054*** (0.01)	-0.062*** (0.02)	-0.054*** (0.01)	-0.047*** (0.01)	-0.022 (0.02)	-0.047*** (0.01)	-0.052*** (0.01)	-0.071*** (0.02)	-0.053*** (0.01)	-0.058*** (0.01)	-0.079*** (0.02)	-0.058*** (0.01)	-0.052*** (0.01)	-0.062*** (0.02)	-0.052*** (0.01)
capital	0.001 (0.00)	-0.001 (0.00)	0.001 (0.00)	0.002** (0.00)	0.000 (0.00)	0.002** (0.00)	0.001 (0.00)	-0.003 (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002 (0.00)	0.001 (0.00)	0.001 (0.00)	-0.002 (0.00)	0.001 (0.00)
quality	0.003* (0.00)	0.001 (0.00)	0.003 (0.00)	0.004** (0.00)	0.001 (0.00)	0.003 (0.00)	0.004** (0.00)	0.001 (0.00)	0.004** (0.00)	0.002 (0.00)	0.001 (0.00)	0.002 (0.00)	0.004** (0.00)	0.001 (0.00)	0.004** (0.00)
CPI	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.006*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.006*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)
GDPG	-0.001 (0.00)	-0.009 (0.00)	-0.001 (0.00)	-0.004 (0.00)	-0.001 (0.00)	-0.004 (0.00)	-0.009** (0.00)	0.003 (0.00)	-0.009** (0.00)	0.005 (0.00)	-0.006 (0.01)	0.005 (0.00)	-0.005 (0.00)	0.009** (0.00)	-0.004 (0.00)
COVID	0.083*** (0.03)	0.047 (0.03)	0.083*** (0.03)	0.097*** (0.03)	0.117*** (0.03)	0.099*** (0.03)	0.079*** (0.03)	0.169*** (0.03)	0.082*** (0.03)	0.087*** (0.04)	0.058*** (0.04)	0.086*** (0.04)	0.099*** (0.03)	0.169*** (0.03)	0.102*** (0.03)
cons	2.642** (0.21)	2.550** (0.46)	2.640** (0.22)	2.873** (0.16)	2.634** (0.39)	2.900** (0.17)	1.838** (0.16)	1.722** (0.43)	1.835** (0.17)	2.045** (0.23)	2.622** (0.44)	2.050** (0.23)	0.993** (0.21)	0.344 (0.45)	0.971** (0.22)
N	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)	919 (0.00)
r2	0.502	0.492	0.502	0.533	0.531	0.532	0.520	0.520	0.520	0.500	0.496	0.532	0.532	0.536	0.536
r2 a	0.497	0.446	0.497	0.529	0.488	0.529	0.515	0.476	0.515	0.495	0.449	0.527	0.527	0.494	0.494
F	101.831***	90.556***	101.831***	115.396***	105.720***	115.396***	109.383***	101.184***	109.383***	101.077***	91.791***	114.847***	114.847***	108.083***	108.083***
BP LM		chibar2(01) = 0.25			chibar2(01) = 2.12*			chibar2(01) = 0.62			chibar2(01) = 0.86			chibar2(01) = 1.25**	
chi2		911.893***			1026.731***			970.869***			907.542***			1020.541***	
Hausman		chi2(9) = 18.32*			chi2(9) = 21.47**			chi2(9) = 27.77***			chi2(9) = 29.93***			chi2(9) = 34.85***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B15: Moderating Effect of EPU on the Impact of Globalisation on IBs: South Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	-2.127 (3.82)	-6.542* (3.71)	-2.127 (3.82)	-4.359 (3.21)	-5.152* (2.92)	-4.939* (2.93)	5.256** (2.21)	4.655** (2.04)	5.316** (2.05)	-0.339 (2.67)	1.263 (2.60)	0.701 (2.52)	7.153 (5.20)	3.752 (4.76)	5.691 (4.85)
TrGI	0.001 (0.01)	-0.031** (0.01)	0.001 (0.01)												
TrGI*EPU	0.066 (0.11)	0.196* (0.11)	0.066 (0.11)												
FIGI				-0.005 (0.01)	-0.037** (0.01)	-0.026** (0.01)									
FIGI*EPU				0.134 (0.10)	0.163* (0.09)	0.154* (0.09)									
IpGI							0.002 (0.01)	0.042** (0.01)	0.016** (0.01)						
IpGI*EPU							-0.140** (0.06)	-0.126** (0.06)	-0.142** (0.06)						
InGI										0.006 (0.01)	0.009 (0.01)	0.006 (0.01)			
InGI*EPU										0.008 (0.05)	-0.019 (0.05)	-0.010 (0.05)			
CuGI													0.001 (0.01)	0.061** (0.02)	0.024 (0.02)
CuGI*EPU													-0.213 (0.16)	-0.114 (0.15)	-0.170 (0.15)
capital	(0.01)	(0.03)	(0.01)	(0.01)	(0.04)	(0.02)	(0.01)	(0.03)	(0.02)	(0.01)	(0.04)	(0.02)	(0.01)	(0.03)	(0.02)
quality	-0.006*** (0.00)	-0.007*** (0.00)	-0.006*** (0.00)	-0.007*** (0.00)	-0.005 (0.00)	-0.004 (0.00)	-0.007*** (0.00)	-0.008** (0.00)	-0.005 (0.00)	-0.006*** (0.00)	-0.007*** (0.00)	-0.005*** (0.00)	-0.007*** (0.00)	-0.005 (0.00)	-0.005 (0.00)
CPI	-0.003 (0.00)	0.005 (0.01)	-0.003 (0.00)	-0.004 (0.00)	0.010* (0.01)	0.003 (0.01)	-0.003 (0.00)	0.006 (0.01)	0.003 (0.00)	-0.004 (0.00)	0.007 (0.01)	0.000 (0.00)	-0.004 (0.00)	0.010* (0.01)	0.001 (0.00)
GDPG	-0.010 (0.01)	0.005 (0.01)	-0.010 (0.01)	-0.009 (0.01)	0.001 (0.01)	-0.002 (0.01)	-0.002 (0.00)	0.009 (0.01)	0.001 (0.01)	-0.011 (0.01)	0.003 (0.01)	-0.002 (0.01)	-0.009 (0.01)	0.009 (0.01)	-0.002 (0.01)
COVID	-0.029 (0.08)	0.076 (0.08)	-0.029 (0.08)	-0.007 (0.08)	0.088 (0.08)	0.056 (0.07)	-0.003 (0.07)	0.147* (0.08)	0.043 (0.07)	-0.001 (0.10)	0.028 (0.09)	0.009 (0.09)	-0.027 (0.07)	0.080 (0.07)	0.009 (0.07)
cons	3.197** (0.57)	4.136** (0.94)	3.197** (0.57)	3.503** (0.46)	3.852** (0.74)	3.923** (0.56)	3.239** (0.34)	1.727** (0.70)	2.497** (0.53)	3.132** (0.62)	2.495** (0.93)	2.891** (0.67)	3.341** (0.53)	0.769 (0.88)	2.284** (0.66)
N	1.35 (0.607)	1.35 (0.454)	1.35 (0.57)	1.35 (0.612)	1.35 (0.480)	1.35 (0.56)	1.35 (0.633)	1.35 (0.503)	1.35 (0.421)	1.35 (0.578)	1.35 (0.436)	1.35 (0.436)	1.35 (0.615)	1.35 (0.488)	1.35 (0.488)
r2 a	0.578 (21.427**)	0.364 (10.619**)		0.584 (21.917**)	0.394 (11.789**)		0.607 (23.965**)	0.421 (12.926**)		0.578 (21.362**)	0.343 (9.877**)		0.587 (22.192**)	0.403 (12.160**)	
F															
BP LM															
chi2			192.844**			122.999**		chibar2(01) =5.96**	119.273**		chibar2(01) = 8.47**	121.886**		chibar2(01) =3.25**	120.589**
Hausman			chi2(8) = 21.18			chi2(8) = 10.57		chi2(8) =2.78*	chi2(8) =12.06		chi2(8) =8.53			chi2(7) = 15.57	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B16: Regression Results of CG on Banks: Southeast Aisa

Variable	CB				IB			
	Model 1		Model 2		Model 3		Model 4	
	ols	fe	ols	fe	ols	fe	ols	fe
COC	-0.009 (0.01)	-0.003 (0.05)	-0.014 (0.01)		0.005 (0.06)	-0.149 (0.11)	-0.020 (0.07)	
VA				-0.232*** (0.06)				-0.558*** (0.12)
size	-0.047*** (0.00)	-0.031** (0.01)	-0.046*** (0.00)	-0.031** (0.01)	-0.047*** (0.01)	-0.068** (0.03)	-0.048** (0.02)	-0.047*** (0.03)
capital	-0.002** (0.00)	-0.001 (0.00)	-0.001* (0.00)	-0.000 (0.00)	0.000 (0.00)	-0.004 (0.00)	-0.002 (0.00)	-0.000 (0.00)
quality	-0.002 (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.000 (0.00)	-0.004 (0.00)	0.010** (0.01)	0.004 (0.00)	0.007 (0.00)
CPI	-0.007*** (0.00)	-0.008*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.009*** (0.00)	-0.007*** (0.00)	-0.008*** (0.00)	-0.005*** (0.00)
GDPG	-0.014*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)	-0.018*** (0.00)	-0.019*** (0.00)	-0.019*** (0.00)	-0.022*** (0.00)
COVID	-0.122*** (0.02)	-0.119*** (0.02)	-0.120*** (0.02)	-0.126*** (0.02)	-0.162*** (0.06)	-0.177*** (0.05)	-0.170*** (0.05)	-0.165*** (0.05)
cons	2.394*** (0.09)	2.152*** (0.29)	2.410*** (0.11)	2.435*** (0.08)	2.627*** (0.36)	2.855*** (0.74)	2.614*** (0.47)	2.129*** (0.73)
N	1766	1766	1766	1766	333	333	333	333
r2	0.412	0.431		0.436	0.295	0.309		0.350
r2_a	0.410	0.382		0.387	0.280	0.233		0.278
F	175.933***	176.025***		179.602***	19.415***	19.123***		22.486***
BP LM	chibar2(01) = 38.09***		chibar2(01) = 38.43***		chibar2(01) = 39.26***		chibar2(01) = 38.22***	
chi2		1265.437***				137.020***		164.959***
Hausman		chi2(7) = 23.85***		chi2(7) = 16.98**		chi2(7) = 20.60***		chi2(7) = 16.85**

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B17 : Regression Results of Globalisation on CBs: Southeast Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	-0.002*** (0.00)	-0.033*** (0.00)	-0.003*** (0.00)												
FIGI				-0.003*** (0.00)	-0.025*** (0.00)	-0.005*** (0.00)									
IpGI				-0.001*** (0.00)			-0.001*** (0.00)	0.021*** (0.00)	-0.001** (0.00)						
InGI										-0.002*** (0.00)	-0.006*** (0.00)	-0.003*** (0.00)			
CuGI													-0.002*** (0.00)	0.000 (0.00)	-0.002*** (0.00)
size	-0.040*** (0.00)	-0.013 (0.01)	-0.037*** (0.00)	-0.040*** (0.00)	-0.034*** (0.01)	-0.035*** (0.00)	-0.044*** (0.00)	-0.031*** (0.01)	-0.044*** (0.00)	-0.042*** (0.00)	-0.026*** (0.01)	-0.040*** (0.00)	-0.043*** (0.00)	-0.031*** (0.01)	-0.043*** (0.00)
capital	-0.001* (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.001* (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.002** (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001* (0.00)	-0.000 (0.00)	-0.001 (0.00)	-0.001** (0.00)	-0.001 (0.00)	-0.001 (0.00)
quality	-0.003 (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.003 (0.00)	0.003 (0.00)	-0.002 (0.00)	-0.002 (0.00)	0.003 (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.002 (0.00)
CPI	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	-0.008*** (0.00)	-0.013*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)	-0.011*** (0.00)	-0.008*** (0.00)	-0.007*** (0.00)	-0.010*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.006*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.008*** (0.00)	-0.007*** (0.00)
GDPG	-0.015*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.018*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.014*** (0.00)	-0.015*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)
COVID	-0.122*** (0.02)	-0.157*** (0.02)	-0.122*** (0.02)	-0.116*** (0.02)	-0.097*** (0.02)	-0.113*** (0.02)	-0.126*** (0.02)	0.003 (0.03)	-0.124*** (0.02)	-0.124*** (0.02)	-0.126*** (0.02)	-0.123*** (0.02)	-0.124*** (0.02)	-0.119*** (0.02)	-0.123*** (0.02)
cons	2.467*** (0.08)	4.399*** (0.33)	2.506*** (0.10)	2.513*** (0.08)	4.053*** (0.32)	2.599*** (0.10)	2.392*** (0.08)	1.393*** (0.31)	2.420*** (0.10)	2.418*** (0.08)	2.303*** (0.28)	2.436*** (0.10)	2.428*** (0.08)	2.153*** (0.30)	2.456*** (0.10)
N	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766	1766
r2	0.418	0.476		0.419	0.476		0.414	0.442		0.417	0.436		0.415	0.431	
r2_a	0.416	0.431		0.416	0.430		0.412	0.394		0.415	0.387		0.413	0.382	
F	180.334***	211.087***		180.925***	210.478***		177.494***	183.855***		179.766***	179.455***		178.065***	176.024***	
BP LM		chibar2(01) =22.48***			chibar2(01) =29.15***			chibar2(01) =16.84***			chibar2(01) =18.91***			chibar2(01) =17.06***	
chi2		chi2(7) =139.11***	1308.783***		chi2(7) =127.35***	1327.585***		chi2(7) =16.84***	1272.603***		chi2(7) =30.93***	1292.219***		chi2(7) =26.14***	1276.230***
Hausman															

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B18 : Regression Results of Globalisation on IBs: Southeast Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
TrGI	0.000 (0.00)	-0.031*** (0.01)	-0.001 (0.00)												
FIGI				-0.001 (0.00)	-0.010* (0.01)	-0.002 (0.00)									
IpGI							0.001 (0.00)	0.028*** (0.01)	0.002 (0.00)						
InGI										-0.000 (0.00)	-0.010* (0.01)	-0.001 (0.00)			
CuGI													0.001 (0.00)	-0.012 (0.01)	0.001 (0.00)
size	-0.048*** (0.01)	-0.045 (0.03)	-0.048** (0.02)	-0.044*** (0.01)	-0.068** (0.03)	-0.044** (0.02)	-0.056*** (0.01)	-0.065** (0.03)	-0.067*** (0.02)	-0.046*** (0.01)	-0.073** (0.03)	-0.047** (0.02)	-0.050*** (0.01)	-0.077** (0.03)	-0.055*** (0.02)
capital	0.000 (0.00)	-0.003 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.003 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.001 (0.00)	0.000 (0.00)	-0.005 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.004 (0.00)	-0.002 (0.00)
quality	-0.004 (0.00)	0.005 (0.01)	0.004 (0.00)	-0.004 (0.00)	0.009* (0.01)	0.003 (0.00)	-0.004 (0.00)	0.010** (0.01)	0.003 (0.00)	-0.004 (0.00)	0.009* (0.01)	0.004 (0.00)	-0.004 (0.00)	0.010** (0.01)	0.003 (0.00)
CPI	-0.008*** (0.00)	-0.011*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.005*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)	-0.006*** (0.00)	-0.008*** (0.00)
GDPG	-0.018*** (0.01)	-0.017*** (0.01)	-0.019*** (0.01)	-0.018*** (0.01)	-0.020*** (0.01)	-0.019*** (0.01)	-0.018*** (0.01)	-0.016*** (0.01)	-0.018*** (0.01)	-0.018*** (0.01)	-0.019*** (0.01)	-0.019*** (0.01)	-0.018*** (0.01)	-0.020*** (0.01)	-0.019*** (0.01)
COVID	-0.162*** (0.06)	-0.239*** (0.06)	-0.170*** (0.05)	-0.161*** (0.06)	-0.159*** (0.05)	-0.166*** (0.05)	-0.159*** (0.06)	-0.026 (0.07)	-0.158*** (0.05)	-0.162*** (0.06)	-0.160*** (0.05)	-0.168*** (0.05)	-0.163*** (0.06)	-0.173*** (0.05)	-0.168*** (0.05)
cons	2.610*** (0.32)	5.005*** (0.91)	2.682*** (0.40)	2.627*** (0.32)	3.646*** (0.78)	2.715*** (0.39)	2.689*** (0.32)	1.265 (0.94)	2.850*** (0.41)	2.612*** (0.32)	3.601*** (0.76)	2.665*** (0.40)	2.615*** (0.32)	3.915*** (0.94)	2.700*** (0.39)
N	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333
r2	0.295	0.329		0.295	0.312		0.297	0.325		0.295	0.313		0.295	0.309	
r2_a	0.280	0.255		0.280	0.236		0.282	0.251		0.280	0.237		0.280	0.233	
F	19.420***	20.987***		19.423***	19.381***		19.657***	20.584***		19.414***	19.473***		19.452***	19.089***	
BP LM	chibar2(01) =38.09***			chibar2(01) =38.43***			chibar2(01) =39.26***			chibar2(01) =38.22***			chibar2(01) =38.25***		
chi2	137.046***			137.398***			139.231***			137.134***			137.036***		
Hausman	chi2(7) =23.85***			chi2(7) =16.98***			chi2(7) =20.66***			chi2(7) =16.85***			chi2(7) =15.40***		

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B19 : Moderating Effect of EPU on the Impact of CG on CBs: Southeast Aisa

Variable	Model 1			Model 2		
	ols	fe	re	ols	fe	re
EPU	-0.027 (0.07)	0.032 (0.07)	-0.012 (0.07)	0.041 (0.06)	0.055 (0.06)	0.047 (0.06)
COC	0.010 (0.01)	0.007 (0.05)	0.002 (0.01)			
COC*EPU	-0.185* (0.10)	-0.045 (0.11)	-0.145 (0.10)			
VA				0.015 (0.05)	-0.228** (0.07)	-0.014 (0.05)
VA*EPU				0.170 (0.30)	-0.066 (0.29)	0.130 (0.29)
size	-0.046*** (0.00)	-0.031** (0.01)	-0.046*** (0.00)	-0.047*** (0.00)	-0.031** (0.01)	-0.049*** (0.00)
capital	-0.002** (0.00)	-0.001 (0.00)	-0.001* (0.00)	-0.002** (0.00)	-0.000 (0.00)	-0.002** (0.00)
quality	-0.002 (0.00)	0.000 (0.00)	-0.002 (0.00)	-0.001 (0.00)	-0.000 (0.00)	-0.001 (0.00)
CPI	-0.007*** (0.00)	-0.008*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)
GDPG	-0.014*** (0.00)	-0.016*** (0.00)	-0.014*** (0.00)	-0.014*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)
COVID	-0.114*** (0.02)	-0.120*** (0.02)	-0.115*** (0.02)	-0.122*** (0.02)	-0.132*** (0.02)	-0.123*** (0.02)
_cons	2.384*** (0.09)	2.152*** (0.29)	2.400*** (0.11)	2.423*** (0.09)	2.052*** (0.28)	2.457*** (0.10)
N	1766	1766	1766	1766	1766	1766
r2_a	0.413	0.432		0.412	0.437	
r2_a	0.410	0.382		0.409	0.387	
F	137.330***	136.879***		136.825***	139.705***	
BP LM		chibar2(01) =17.58***			chibar2(01) = 16.27***	
chi2			1261.974***			1256.013***
Hausman		chi2(9) = 36.92***				chi2(9) = 55.45***

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B20 Moderating Effect of EPU on the Impact of CG on IBs: Southeast Aisa

Variable	Model 1				Model 2			
	ols	fe	re		ols	fe	re	
EPU	-0.078 (0.17)	-0.092 (0.16)	-0.083 (0.16)		0.048 (0.20)	0.019 (0.19)	0.039 (0.19)	
COC	-0.029 (0.08)	-0.173 (0.12)	-0.054 (0.09)					
COC*EPU	0.233 (0.45)	0.152 (0.42)	0.227 (0.42)					
VA					-0.462*** (0.13)	-0.602*** (0.14)	-0.526** (0.12)	
VA*EPU					0.619 (0.67)	0.493 (0.62)	0.602 (0.62)	
size	-0.046*** (0.01)	-0.066** (0.03)	-0.047** (0.02)		-0.066*** (0.01)	-0.049 (0.03)	-0.072*** (0.02)	
capital	0.000 (0.00)	-0.004 (0.00)	-0.002 (0.00)		0.001 (0.00)	-0.002 (0.00)	-0.000 (0.00)	
quality	-0.004 (0.00)	0.010** (0.01)	0.003 (0.00)		-0.006 (0.00)	0.007 (0.00)	0.001 (0.00)	
CPI	-0.009*** (0.00)	-0.007*** (0.00)	-0.008*** (0.00)		-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	
GDPG	-0.017** (0.01)	-0.018** (0.01)	-0.018** (0.01)		-0.017** (0.01)	-0.020*** (0.01)	-0.019** (0.01)	
COVID	-0.151** (0.07)	-0.160** (0.07)	-0.157** (0.07)		-0.147** (0.07)	-0.150** (0.06)	-0.146** (0.06)	
_cons	2.629*** (0.37)	2.844*** (0.75)	2.610*** (0.47)		2.581*** (0.32)	2.171*** (0.73)	2.671*** (0.39)	
N	333	333	333		333	333	333	
r ²	0.296	0.311			0.328	0.352		
r ² _a	0.277	0.229			0.310	0.275		
F	15.104***	14.871***			17.550***	17.894***		
BP LM		chibar2(01) = 38.56***				chibar2(01) = 50.20***		
chi2			137.267***					165.807***
Hausman			chi2(9) = 16.80*					chi2(9) = 15.98*

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B21: Moderating Effect of EPU on the Impact of Globalisation on CBs: Southeast Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	0.006 (0.26)	0.070 (0.25)	-0.083 (0.26)	0.704** (0.36)	-0.326 (0.35)	0.500 (0.35)	0.129 (0.15)	0.311** (0.16)	0.103 (0.15)	0.589 (0.36)	0.384 (0.35)	0.527 (0.35)	0.234 (0.31)	0.105 (0.31)	0.177 (0.30)
TrGI	-0.002*** (0.00)	-0.035*** (0.00)	-0.003*** (0.00)												
TrGI*EPU	0.000 (0.00)	0.002 (0.00)	0.002 (0.00)												
FIGI				-0.002** (0.00)	-0.026*** (0.00)	-0.004*** (0.00)									
FIGI*EPU				-0.012** (0.01)	0.008 (0.01)	-0.008 (0.01)									
IpGI							-0.000 (0.00)	0.024** (0.00)	-0.001 (0.00)						
IpGI*EPU							-0.002 (0.00)	-0.004 (0.00)	-0.002 (0.00)						
InGI										-0.001 (0.00)	-0.006*** (0.00)	-0.002* (0.00)			
InGI*EPU										-0.008 (0.01)	-0.005 (0.00)	-0.007 (0.00)			
CuGI													-0.001 (0.00)	0.000 (0.00)	-0.001 (0.00)
CuGI*EPU													-0.003 (0.00)	-0.001 (0.00)	-0.002 (0.00)
size	-0.040** (0.00)	-0.012 (0.01)	-0.037** (0.00)	-0.040*** (0.00)	-0.033** (0.01)	-0.036*** (0.00)	-0.044** (0.00)	-0.032** (0.01)	-0.044** (0.00)	-0.042*** (0.00)	-0.027* (0.01)	-0.041*** (0.00)	-0.043** (0.00)	-0.031* (0.01)	-0.043** (0.00)
capital	-0.001* (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.001* (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.002* (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001* (0.00)	-0.000 (0.00)	-0.001 (0.00)	-0.001** (0.00)	-0.001 (0.00)	-0.001 (0.00)
quality	-0.003 (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.003 (0.00)	0.003 (0.00)	-0.002 (0.00)	-0.002 (0.00)	0.004 (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.002 (0.00)	-0.003 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.002 (0.00)
CPI	-0.008*** (0.00)	-0.013*** (0.00)	-0.008*** (0.00)	-0.008*** (0.00)	-0.011*** (0.00)	-0.008*** (0.00)	-0.007*** (0.00)	-0.010*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.006*** (0.00)	-0.007*** (0.00)	-0.007*** (0.00)	-0.008*** (0.00)	-0.007*** (0.00)
GDPG	-0.015*** (0.00)	-0.017*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.020*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.014*** (0.00)	-0.015*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)	-0.015*** (0.00)	-0.016*** (0.00)	-0.015*** (0.00)
COVID	-0.123*** (0.02)	-0.179*** (0.02)	-0.126*** (0.02)	-0.102*** (0.02)	-0.118*** (0.02)	-0.105*** (0.02)	-0.123*** (0.02)	0.015 (0.03)	-0.124*** (0.02)	-0.118*** (0.02)	-0.127*** (0.02)	-0.119*** (0.02)	-0.122*** (0.02)	-0.121*** (0.02)	-0.122*** (0.02)
cons	2.464*** (0.09)	4.488*** (0.33)	2.504*** (0.10)	2.454*** (0.09)	4.141*** (0.32)	2.542*** (0.10)	2.372*** (0.09)	1.266*** (0.32)	2.399*** (0.10)	2.324*** (0.10)	2.248*** (0.29)	2.349*** (0.11)	2.391*** (0.10)	2.134*** (0.30)	2.422*** (0.11)
N	1.766 (0.09)	1.766 (0.33)	1.766 (0.10)	1.766 (0.09)	1.766 (0.32)	1.766 (0.10)	1.766 (0.09)	1.766 (0.32)	1.766 (0.10)	1.766 (0.10)	1.766 (0.29)	1.766 (0.11)	1.766 (0.10)	1.766 (0.30)	1.766 (0.11)
r2	0.418	0.480		0.420	0.478		0.414	0.444		0.418	0.437		0.415	0.432	
r2 a	0.415	0.434		0.417	0.432		0.411	0.395		0.415	0.387		0.412	0.381	
F	140.104***	166.038***		141.333***	164.821***		138.028***	143.906***		140.175***	139.762***		138.451***	136.851***	
BP LM		chibar2(01) = 22.57***			chibar2(01) = 26.28***			chibar2(01) = 16.48***			chibar2(01) = 18.31***			chibar2(01) = 16.79***	
chi2		1301.176***			1322.251***			1266.864***			1289.475***			1270.068***	
Hausman		chibar2(01) = 152.87***			chibar2(01) = 135.53***			chibar2(01) = 70.94***			chibar2(01) = 38.19***			chibar2(01) = 34.56***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table B22: Moderating Effect of EPU on the Impact of Globalisation on IBs: Southeast Aisa

Variable	Model1			Model2			Model3			Model4			Model5		
	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re	ols	fe	re
EPU	-0.498 (0.86)	0.086 (0.79)	-0.397 (0.80)	-1.048 (1.29)	-0.743 (1.19)	-0.911 (1.20)	-0.200 (0.54)	0.128 (0.50)	-0.148 (0.50)	-0.890 (1.17)	-0.858 (1.08)	-0.947 (1.09)	-0.584 (1.00)	-0.519 (0.93)	-0.537 (0.93)
TrGI	-0.000 (0.00)	-0.030** (0.01)	-0.001 (0.00)												
TrGI*EPU	0.006 (0.01)	-0.002 (0.01)	0.004 (0.01)												
FIGI				-0.003 (0.00)	-0.011* (0.01)	-0.004 (0.00)									
FIGI*EPU				0.015 (0.02)	0.011 (0.02)	0.013 (0.02)									
IpGI							0.001 (0.00)	0.028*** (0.01)	0.002 (0.00)						
IpGI*EPU							0.002 (0.01)	-0.003 (0.01)	0.001 (0.01)						
InGI										-0.002 (0.00)	-0.012** (0.01)	-0.003 (0.00)			
InGI*EPU										0.010 (0.01)	0.010 (0.01)	0.011 (0.01)			
CuGI													-0.000 (0.00)	-0.013 (0.01)	-0.000 (0.00)
CuGI*EPU													0.007 (0.01)	0.006 (0.01)	0.006 (0.01)
size	-0.047*** (0.01)	-0.046 (0.03)	-0.048** (0.02)	-0.044*** (0.01)	-0.066*** (0.03)	-0.044** (0.02)	-0.056*** (0.01)	-0.067*** (0.03)	-0.067*** (0.02)	-0.045*** (0.01)	-0.069*** (0.03)	-0.046*** (0.02)	-0.049*** (0.01)	-0.075*** (0.03)	-0.054*** (0.02)
capital	0.000 (0.00)	-0.003 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.003 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.001 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.005 (0.00)	-0.002 (0.00)	0.000 (0.00)	-0.004 (0.00)	-0.002 (0.00)
quality	-0.004 (0.00)	0.005 (0.01)	0.003 (0.00)	-0.004 (0.00)	0.009 (0.01)	0.003 (0.00)	-0.004 (0.00)	0.010 (0.01)	0.003 (0.00)	-0.004 (0.00)	0.008 (0.01)	0.003 (0.00)	-0.004 (0.00)	0.010 (0.01)	0.003 (0.00)
CPI	-0.009*** (0.00)	-0.011*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.005*** (0.00)	-0.008*** (0.00)	-0.009*** (0.00)	-0.006*** (0.00)	-0.008*** (0.00)
GDPG	-0.017*** (0.01)	-0.015*** (0.01)	-0.018*** (0.01)	-0.018*** (0.01)	-0.020*** (0.01)	-0.019*** (0.01)	-0.016*** (0.01)	-0.015*** (0.01)	-0.017*** (0.01)	-0.018*** (0.01)	-0.019*** (0.01)	-0.019*** (0.01)	-0.017*** (0.01)	-0.019*** (0.01)	-0.018*** (0.01)
COVID	-0.149*** (0.07)	-0.216*** (0.07)	-0.154*** (0.07)	-0.161*** (0.07)	-0.162*** (0.07)	-0.164*** (0.07)	-0.144*** (0.07)	-0.007 (0.08)	-0.140*** (0.07)	-0.161*** (0.08)	-0.163*** (0.07)	-0.168*** (0.07)	-0.154*** (0.07)	-0.169*** (0.07)	-0.157*** (0.07)
cons	2.683*** (0.33)	5.041*** (0.91)	2.742*** (0.41)	2.777*** (0.37)	3.710*** (0.78)	2.840*** (0.42)	2.723*** (0.33)	1.274 (0.95)	2.880*** (0.42)	2.739*** (0.35)	3.671*** (0.76)	2.794*** (0.43)	2.703*** (0.34)	3.961*** (0.95)	2.781*** (0.41)
N	333	333	333	333	333	333	333	333	333	333	333	333	333	333	333
r2	0.296	0.330		0.297	0.313		0.298	0.326		0.297	0.315		0.297	0.310	
r2 a	0.277	0.251		0.277	0.232		0.279	0.246		0.277	0.234		0.277	0.229	
F	15.100***	16.277***		15.155***	15.050***		15.246***	15.942***		15.135***	15.178***		15.127***	14.823***	
BP LM		chibar2(01) = 38.22***			chibar2(01) = 38.47***			chibar2(01) = 39.42***			chibar2(01) = 38.93***			chibar2(01) = 38.56***	
chi2		136.923***			137.658***			138.914***			137.957***			137.193***	
Hausman		chi2(9) = 26.05***			chi2(9) = 19.19***			chi2(9) = 21.96***			chi2(9) = 16.94***			chi2(9) = 16.12***	

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Appendix C

Data for CG and Globalisation

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Bangladesh	2005	-1.406	-0.570	22.242	36.607	21.522	28.028	33.957
Bangladesh	2006	-1.443	-0.451	33.037	32.653	23.833	31.847	34.008
Bangladesh	2007	-1.063	-0.573	34.026	31.258	38.518	33.681	34.321
Bangladesh	2008	-1.047	-0.442	35.601	24.018	39.528	43.859	35.971
Bangladesh	2009	-1.075	-0.289	33.293	23.696	41.121	46.680	36.136
Bangladesh	2010	-1.054	-0.268	35.242	32.789	43.388	49.186	36.056
Bangladesh	2011	-1.097	-0.315	37.509	32.144	45.236	50.845	35.047
Bangladesh	2012	-0.857	-0.402	37.372	31.601	46.015	53.973	34.845
Bangladesh	2013	-0.894	-0.405	38.419	31.380	45.087	55.704	34.087
Bangladesh	2014	-0.892	-0.474	32.168	34.334	46.649	57.024	36.007
Bangladesh	2015	-0.844	-0.512	30.377	30.564	46.789	57.792	36.854
Bangladesh	2016	-0.887	-0.584	27.674	30.484	45.834	57.492	37.038
Bangladesh	2017	-0.859	-0.615	30.988	29.916	44.961	57.445	37.167
Bangladesh	2018	-0.927	-0.742	30.924	29.654	44.060	59.096	34.640
Bangladesh	2019	-1.017	-0.742	30.325	29.382	42.252	59.717	34.724
Bangladesh	2020	-1.004	-0.770	28.890	29.457	42.639	60.531	34.953
Bangladesh	2021	-0.986	-0.775	30.038	29.792	42.799	61.907	34.932
Egypt	2005	-0.539	-0.965	57.734	60.229	43.357	51.497	36.620
Egypt	2006	-0.737	-1.199	58.226	62.205	44.787	55.197	37.725
Egypt	2007	-0.738	-1.168	60.808	63.928	47.764	57.774	38.196
Egypt	2008	-0.766	-1.212	61.263	59.277	49.161	67.203	43.021
Egypt	2009	-0.465	-1.157	56.181	54.975	50.546	68.513	45.029
Egypt	2010	-0.597	-1.188	55.800	56.019	52.585	68.622	45.560
Egypt	2011	-0.633	-1.140	53.689	52.900	53.211	69.680	44.216
Egypt	2012	-0.580	-0.765	52.932	46.917	54.586	71.524	48.138
Egypt	2013	-0.614	-1.052	50.821	36.399	55.421	71.181	58.256
Egypt	2014	-0.575	-1.180	46.221	42.423	54.661	72.217	59.793
Egypt	2015	-0.601	-1.190	42.466	34.459	53.426	71.669	60.160
Egypt	2016	-0.591	-1.205	40.515	35.052	52.238	71.624	61.026
Egypt	2017	-0.496	-1.251	47.882	49.783	52.097	72.850	61.184
Egypt	2018	-0.514	-1.325	49.043	50.937	52.186	74.208	62.208
Egypt	2019	-0.655	-1.444	46.047	50.797	53.121	75.342	62.339
Egypt	2020	-0.811	-1.483	38.314	47.713	53.222	77.947	59.008
Egypt	2021	-0.706	-1.507	40.386	47.534	51.566	78.135	58.951
Indonesia	2005	-0.906	-0.122	63.249	65.443	26.273	44.839	44.167
Indonesia	2006	-0.864	-0.084	60.840	64.173	26.918	46.879	45.868
Indonesia	2007	-0.631	-0.020	57.824	63.649	28.562	49.092	45.127
Indonesia	2008	-0.639	-0.011	58.246	58.048	30.238	50.491	48.266
Indonesia	2009	-0.890	-0.001	53.540	57.378	30.894	50.725	47.412
Indonesia	2010	-0.804	-0.038	52.085	55.023	32.378	61.576	56.659

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Indonesia	2011	-0.756	-0.009	52.547	51.530	33.163	62.001	57.546
Indonesia	2012	-0.689	0.068	53.281	52.259	34.007	63.126	55.049
Indonesia	2013	-0.660	0.036	52.993	52.429	35.044	64.706	54.691
Indonesia	2014	-0.598	0.154	52.021	57.234	35.565	65.257	59.157
Indonesia	2015	-0.519	0.185	49.385	52.480	35.381	65.752	57.906
Indonesia	2016	-0.462	0.168	47.067	52.393	36.072	65.337	57.505
Indonesia	2017	-0.305	0.132	46.849	52.093	36.126	64.824	57.040
Indonesia	2018	-0.299	0.162	48.504	52.601	38.042	66.823	56.971
Indonesia	2019	-0.473	0.131	47.158	52.414	34.967	68.381	56.724
Indonesia	2020	-0.454	0.099	44.588	52.150	32.142	68.124	56.805
Indonesia	2021	-0.449	0.150	44.415	51.081	31.248	68.536	57.030
Iraq	2005	-1.378	-1.301	57.564	38.740	25.508	37.795	27.757
Iraq	2006	-1.451	-1.282	52.718	40.841	30.493	38.126	27.531
Iraq	2007	-1.461	-1.126	49.775	39.000	32.794	40.307	22.516
Iraq	2008	-1.462	-1.105	47.441	30.715	32.534	41.954	22.835
Iraq	2009	-1.328	-1.023	52.176	33.938	33.824	43.305	21.855
Iraq	2010	-1.363	-0.992	52.347	29.609	35.051	44.705	21.579
Iraq	2011	-1.258	-1.070	52.270	27.889	36.115	45.295	21.852
Iraq	2012	-1.248	-1.076	52.180	27.573	35.892	45.606	21.931
Iraq	2013	-1.315	-1.057	52.580	26.651	36.796	56.239	22.622
Iraq	2014	-1.363	-1.144	53.862	27.942	36.628	57.208	23.647
Iraq	2015	-1.433	-1.128	57.206	31.685	34.583	57.462	23.524
Iraq	2016	-1.462	-1.016	52.105	32.678	33.922	57.890	23.699
Iraq	2017	-1.431	-1.047	54.525	32.503	30.487	59.074	22.839
Iraq	2018	-1.458	-1.000	54.191	32.174	30.984	59.562	23.595
Iraq	2019	-1.390	-0.964	57.820	32.824	31.385	62.525	23.745
Iraq	2020	-1.334	-1.007	43.763	35.663	30.710	62.380	23.142
Iraq	2021	-1.269	-0.963	45.725	33.632	31.223	60.096	22.639
Islamic Republic of Iran	2005	-0.478	-1.282	29.113	34.060	31.589	46.045	30.791
Islamic Republic of Iran	2006	-0.484	-1.501	29.839	34.066	41.066	47.652	30.861
Islamic Republic of Iran	2007	-0.556	-1.554	27.095	34.108	41.698	48.337	32.666
Islamic Republic of Iran	2008	-0.755	-1.570	27.832	33.849	43.641	50.221	34.016
Islamic Republic of Iran	2009	-0.767	-1.582	25.106	35.174	45.611	52.788	34.852
Islamic Republic of Iran	2010	-0.949	-1.606	25.275	35.423	51.720	53.471	35.886
Islamic Republic of Iran	2011	-0.881	-1.583	25.017	35.538	52.670	65.599	37.270

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Islamic Republic of Iran	2012	-0.797	-1.600	23.789	32.458	53.294	66.332	36.604
Islamic Republic of Iran	2013	-0.694	-1.608	21.706	34.069	53.184	67.411	40.138
Islamic Republic of Iran	2014	-0.625	-1.581	20.546	33.905	53.632	69.121	40.687
Islamic Republic of Iran	2015	-0.634	-1.514	20.720	33.997	52.350	71.669	39.307
Islamic Republic of Iran	2016	-0.740	-1.343	22.184	33.831	53.012	73.415	40.038
Islamic Republic of Iran	2017	-0.838	-1.300	24.594	24.918	53.194	75.058	41.042
Islamic Republic of Iran	2018	-0.984	-1.330	28.963	27.899	52.289	75.482	40.921
Islamic Republic of Iran	2019	-1.071	-1.386	30.434	33.219	51.871	75.209	41.109
Islamic Republic of Iran	2020	-1.111	-1.476	29.699	35.077	49.202	76.412	40.901
Islamic Republic of Iran	2021	-1.116	-1.468	30.325	32.169	49.476	76.885	40.724
Jordan	2005	0.281	-0.514	71.073	81.767	65.425	60.529	66.103
Jordan	2006	0.279	-0.717	72.210	80.177	64.889	64.396	67.347
Jordan	2007	0.287	-0.677	73.492	81.667	65.704	70.573	66.934
Jordan	2008	0.380	-0.737	75.862	76.696	66.494	72.724	65.571
Jordan	2009	0.165	-0.785	72.824	72.836	67.120	73.858	60.812
Jordan	2010	0.038	-0.799	73.827	73.389	67.165	74.809	58.797
Jordan	2011	0.099	-0.796	74.784	70.737	67.408	75.310	58.506
Jordan	2012	0.071	-0.734	73.368	70.280	68.291	76.154	57.875
Jordan	2013	0.066	-0.807	73.627	70.660	66.662	77.195	59.290
Jordan	2014	0.135	-0.754	73.783	74.817	67.018	77.583	60.765
Jordan	2015	0.244	-0.769	70.563	68.460	66.066	78.255	60.311
Jordan	2016	0.251	-0.711	69.742	67.640	64.353	79.116	68.838
Jordan	2017	0.227	-0.713	70.198	67.725	61.430	78.397	68.811
Jordan	2018	0.124	-0.717	70.100	68.448	61.397	77.579	68.696
Jordan	2019	0.080	-0.695	69.674	68.610	61.594	80.623	68.535
Jordan	2020	0.039	-0.747	60.984	67.972	58.773	81.780	68.948
Jordan	2021	0.027	-0.791	67.499	67.048	58.822	80.169	69.127
Kuwait	2005	0.500	-0.484	73.791	59.067	63.453	61.560	72.505
Kuwait	2006	0.427	-0.582	74.347	62.392	62.787	62.484	69.233
Kuwait	2007	0.365	-0.545	75.173	65.578	63.297	64.449	67.224
Kuwait	2008	0.412	-0.543	74.923	66.710	63.326	68.575	67.050

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Kuwait	2009	0.304	-0.485	76.762	68.344	66.024	69.995	67.511
Kuwait	2010	0.298	-0.524	77.676	68.005	68.090	76.603	68.107
Kuwait	2011	0.079	-0.559	75.989	66.888	68.853	77.862	70.140
Kuwait	2012	-0.197	-0.643	74.237	67.877	68.350	79.221	72.728
Kuwait	2013	-0.195	-0.658	72.739	68.980	69.212	80.394	73.553
Kuwait	2014	-0.246	-0.657	70.708	70.641	69.516	79.892	72.954
Kuwait	2015	-0.255	-0.664	71.350	73.215	69.072	80.088	73.451
Kuwait	2016	-0.298	-0.629	72.721	73.673	68.540	80.820	73.376
Kuwait	2017	-0.360	-0.607	72.257	73.502	68.528	84.226	72.966
Kuwait	2018	-0.317	-0.605	75.184	73.151	67.454	87.491	73.604
Kuwait	2019	-0.159	-0.655	72.040	73.715	66.585	74.980	72.019
Kuwait	2020	-0.092	-0.679	70.521	74.743	65.290	74.486	71.789
Kuwait	2021	-0.056	-0.705	68.823	72.905	65.404	72.714	71.934
Lebanon	2005	-0.532	-0.281	72.622	72.558	60.072	62.678	37.962
Lebanon	2006	-0.999	-0.387	74.092	74.732	60.270	64.882	41.128
Lebanon	2007	-0.939	-0.467	75.743	75.096	60.458	69.762	42.769
Lebanon	2008	-0.858	-0.422	76.945	75.157	61.415	71.810	44.024
Lebanon	2009	-0.872	-0.355	74.504	73.913	63.171	73.606	44.467
Lebanon	2010	-0.915	-0.331	74.261	72.513	66.281	75.880	58.589
Lebanon	2011	-0.900	-0.390	75.972	71.750	66.260	78.204	59.104
Lebanon	2012	-0.866	-0.386	74.595	69.706	63.007	80.686	56.078
Lebanon	2013	-0.924	-0.405	73.206	70.731	61.688	81.304	55.744
Lebanon	2014	-1.042	-0.420	68.717	71.636	60.774	81.906	57.243
Lebanon	2015	-0.901	-0.463	66.974	71.116	60.969	81.252	55.645
Lebanon	2016	-0.990	-0.520	66.804	70.422	61.219	80.933	55.418
Lebanon	2017	-1.028	-0.576	66.321	70.892	60.646	82.020	56.354
Lebanon	2018	-1.133	-0.514	65.967	70.873	60.424	82.051	56.721
Lebanon	2019	-1.169	-0.516	66.730	71.641	60.599	82.434	57.214
Lebanon	2020	-1.179	-0.555	64.828	72.247	60.555	83.331	54.071
Lebanon	2021	-1.248	-0.627	73.140	71.231	60.464	83.256	54.065
Malaysia	2005	0.170	-0.147	77.274	70.972	74.569	67.556	77.884
Malaysia	2006	0.213	-0.543	76.938	72.485	75.171	70.671	78.441
Malaysia	2007	0.167	-0.524	77.916	73.182	75.971	69.565	79.858
Malaysia	2008	-0.091	-0.563	76.902	71.494	76.753	72.213	79.766
Malaysia	2009	-0.094	-0.504	78.111	69.421	78.842	80.495	79.640
Malaysia	2010	0.057	-0.500	79.944	65.405	79.758	81.078	78.563
Malaysia	2011	0.023	-0.475	80.703	65.562	80.050	81.856	79.164
Malaysia	2012	0.213	-0.347	81.070	66.019	80.790	83.292	79.888
Malaysia	2013	0.333	-0.340	81.829	66.308	80.050	83.223	80.932
Malaysia	2014	0.397	-0.360	80.625	72.017	82.576	84.496	81.118
Malaysia	2015	0.182	-0.391	79.815	71.504	81.025	85.431	80.651
Malaysia	2016	0.028	-0.417	80.124	70.431	80.336	86.167	81.080
Malaysia	2017	-0.006	-0.399	80.891	70.821	80.234	87.038	81.818
Malaysia	2018	0.300	-0.100	80.784	69.902	77.812	88.030	82.246
Malaysia	2019	0.233	-0.048	80.796	70.024	79.055	87.796	81.994

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Malaysia	2020	0.229	-0.155	77.215	70.488	77.589	88.222	82.148
Malaysia	2021	0.147	-0.165	76.689	71.842	75.000	89.288	82.089
Pakistan	2005	-1.062	-0.976	39.765	40.472	23.365	39.302	27.523
Pakistan	2006	-0.818	-0.886	40.447	44.066	26.169	43.036	27.907
Pakistan	2007	-0.819	-0.950	40.002	46.867	27.818	44.441	29.219
Pakistan	2008	-0.899	-0.838	40.535	40.569	29.620	51.917	30.097
Pakistan	2009	-1.076	-0.856	37.899	36.090	31.387	54.419	31.991
Pakistan	2010	-1.090	-0.799	40.384	36.742	32.157	56.351	32.331
Pakistan	2011	-1.083	-0.829	38.523	34.791	32.536	56.963	31.497
Pakistan	2012	-1.069	-0.844	38.823	34.388	34.058	57.486	33.639
Pakistan	2013	-0.963	-0.799	38.624	33.973	33.392	57.784	31.865
Pakistan	2014	-0.839	-0.716	34.491	37.365	32.311	58.369	31.484
Pakistan	2015	-0.834	-0.722	34.251	32.837	33.374	58.716	30.105
Pakistan	2016	-0.901	-0.699	33.098	34.130	34.510	58.938	30.888
Pakistan	2017	-0.803	-0.693	33.902	33.299	33.871	58.552	32.195
Pakistan	2018	-0.801	-0.814	34.095	32.786	32.917	59.276	30.133
Pakistan	2019	-0.879	-0.863	33.895	34.341	32.365	60.245	30.786
Pakistan	2020	-0.857	-0.878	33.187	34.892	32.570	60.298	30.486
Pakistan	2021	-0.810	-0.841	35.102	33.385	32.735	60.552	30.698
Qatar	2005	0.705	-0.514	70.164	72.979	67.304	64.239	59.286
Qatar	2006	0.923	-0.866	70.300	73.168	67.271	66.013	69.807
Qatar	2007	0.671	-1.040	69.900	75.397	66.855	67.115	63.057
Qatar	2008	0.932	-1.021	72.779	75.213	65.924	66.497	67.677
Qatar	2009	1.559	-1.003	74.227	78.415	72.651	72.139	70.419
Qatar	2010	1.400	-1.012	72.625	78.679	73.239	69.443	70.708
Qatar	2011	1.001	-1.085	73.415	77.316	72.972	75.761	69.050
Qatar	2012	1.053	-0.922	76.564	77.414	73.438	76.201	68.041
Qatar	2013	1.104	-0.978	75.404	77.809	74.685	80.311	82.468
Qatar	2014	0.984	-1.133	77.952	80.943	74.198	79.064	82.136
Qatar	2015	0.856	-1.145	77.510	76.496	74.226	79.870	81.683
Qatar	2016	0.863	-1.151	76.954	76.487	73.404	79.242	79.619
Qatar	2017	0.699	-1.176	76.798	76.122	72.640	81.088	80.351
Qatar	2018	0.693	-1.207	76.933	76.223	72.241	86.195	83.132
Qatar	2019	0.817	-1.307	75.983	77.170	72.190	84.845	84.061
Qatar	2020	0.754	-1.288	75.533	79.033	72.456	87.332	84.056
Qatar	2021	0.780	-1.174	65.362	77.181	72.648	87.522	83.869
Saudi Arabia	2005	-0.104	-1.536	70.973	55.612	58.359	55.394	55.767
Saudi Arabia	2006	-0.195	-1.781	73.231	59.209	59.130	57.960	58.742
Saudi Arabia	2007	-0.169	-1.705	76.105	63.275	61.542	67.137	58.081
Saudi Arabia	2008	-0.015	-1.730	75.509	63.639	64.319	68.793	59.243
Saudi Arabia	2009	-0.021	-1.822	76.881	68.507	65.828	70.472	59.300

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Saudi Arabia	2010	0.037	-1.788	74.737	66.006	68.558	71.912	62.944
Saudi Arabia	2011	-0.313	-1.907	72.843	61.320	69.425	72.896	64.776
Saudi Arabia	2012	-0.046	-1.866	64.969	58.513	70.064	73.857	64.870
Saudi Arabia	2013	-0.027	-1.876	70.411	58.132	72.189	74.858	59.108
Saudi Arabia	2014	0.082	-1.882	66.731	61.183	72.325	75.015	58.585
Saudi Arabia	2015	0.022	-1.843	62.327	59.328	71.882	80.364	55.799
Saudi Arabia	2016	0.199	-1.727	57.643	60.826	70.860	81.702	61.843
Saudi Arabia	2017	0.332	-1.690	64.368	60.059	68.138	83.178	66.338
Saudi Arabia	2018	0.330	-1.691	65.225	60.134	67.736	83.502	65.803
Saudi Arabia	2019	0.246	-1.660	64.361	61.217	67.583	84.106	66.263
Saudi Arabia	2020	0.241	-1.610	58.590	62.260	67.235	84.245	66.391
Saudi Arabia	2021	0.283	-1.602	60.366	62.223	67.983	82.772	65.896
Singapore	2005	2.156	0.132	93.996	91.922	87.212	79.407	76.903
Singapore	2006	2.175	-0.387	94.284	92.355	87.457	79.451	78.054
Singapore	2007	2.231	-0.363	94.423	93.060	88.616	83.728	78.863
Singapore	2008	2.232	-0.335	96.385	91.737	88.944	83.981	79.562
Singapore	2009	2.207	-0.234	96.065	91.164	89.183	85.200	80.195
Singapore	2010	2.171	-0.209	96.014	92.235	89.437	85.863	80.636
Singapore	2011	2.103	-0.102	95.780	91.281	87.310	86.344	84.683
Singapore	2012	2.116	0.053	95.363	91.485	87.418	86.661	85.838
Singapore	2013	2.071	0.037	95.300	91.913	85.269	87.668	85.091
Singapore	2014	2.068	-0.099	96.380	92.783	86.396	87.692	84.354
Singapore	2015	2.051	-0.162	95.408	91.256	86.634	87.856	84.642
Singapore	2016	2.042	-0.150	95.696	91.223	86.718	88.086	87.569
Singapore	2017	2.088	-0.169	95.719	91.444	89.261	87.893	87.436
Singapore	2018	2.135	-0.077	96.015	91.369	88.631	88.326	87.501
Singapore	2019	2.120	-0.207	96.035	91.614	88.216	88.500	87.589
Singapore	2020	2.118	-0.205	95.952	91.889	84.445	88.908	87.425
Singapore	2021	2.140	-0.140	96.074	91.608	83.731	85.633	87.731
Turkey	2005	-0.035	0.000	58.773	43.947	44.368	58.179	62.610
Turkey	2006	0.027	-0.064	54.284	48.553	46.762	58.425	63.355
Turkey	2007	0.113	-0.053	53.882	51.178	48.520	68.091	65.106
Turkey	2008	0.115	-0.041	55.635	54.102	50.429	69.585	66.492
Turkey	2009	0.088	-0.056	54.429	56.775	51.211	71.021	66.919
Turkey	2010	0.025	-0.085	54.001	53.896	51.681	72.451	67.989
Turkey	2011	0.038	-0.137	55.918	51.906	54.527	73.698	70.233
Turkey	2012	0.161	-0.207	56.003	53.580	54.917	74.654	69.860
Turkey	2013	0.092	-0.251	56.502	51.723	55.868	75.889	66.403

country	year	COC	VA	TrGI	FiGI	IpGI	InGI	CuGI
Turkey	2014	-0.134	-0.338	58.809	56.682	56.731	75.716	67.566
Turkey	2015	-0.161	-0.368	57.421	53.643	56.248	76.328	66.713
Turkey	2016	-0.199	-0.607	55.693	53.546	56.131	76.141	63.728
Turkey	2017	-0.208	-0.706	58.300	55.257	57.078	75.643	60.255
Turkey	2018	-0.351	-0.846	61.810	46.180	57.006	75.807	60.454
Turkey	2019	-0.326	-0.834	63.473	46.833	56.841	76.003	61.507
Turkey	2020	-0.361	-0.861	59.268	47.922	56.144	76.727	61.601
Turkey	2021	-0.408	-0.860	62.970	44.780	53.885	77.067	62.282
United Arab Emirates	2005	0.991	-0.708	88.382	69.960	74.505	66.765	71.543
United Arab Emirates	2006	0.886	-1.000	88.013	72.962	74.325	69.811	76.842
United Arab Emirates	2007	1.006	-0.907	89.442	75.843	75.374	71.652	78.302
United Arab Emirates	2008	1.071	-0.912	90.117	78.380	73.947	77.463	78.485
United Arab Emirates	2009	0.906	-0.838	90.476	77.899	72.935	71.276	78.489
United Arab Emirates	2010	0.891	-0.904	89.334	75.416	73.029	72.025	78.750
United Arab Emirates	2011	1.070	-0.896	90.153	77.022	74.736	72.754	74.215
United Arab Emirates	2012	1.156	-1.001	90.805	78.700	75.572	81.294	75.266
United Arab Emirates	2013	1.274	-1.019	90.418	80.308	76.341	80.476	75.618
United Arab Emirates	2014	1.199	-1.061	89.035	79.276	76.534	80.071	74.818
United Arab Emirates	2015	1.035	-1.112	89.121	82.127	76.907	80.092	73.152
United Arab Emirates	2016	1.131	-1.050	89.603	82.829	76.942	79.459	67.183
United Arab Emirates	2017	1.095	-1.097	88.731	83.406	76.566	81.788	68.934
United Arab Emirates	2018	1.117	-1.123	88.998	83.168	77.340	85.128	70.816
United Arab Emirates	2019	1.072	-1.140	89.194	83.909	77.203	86.288	73.170
United Arab Emirates	2020	1.083	-1.178	89.655	85.869	75.097	88.529	73.902
United Arab Emirates	2021	1.150	-1.192	89.493	85.349	75.604	89.886	73.803

BIODATA OF STUDENT

Luo Heng was born in China on 21st February 1995. He pursued a Bachelor's degree in International Economics and Trade at Hangzhou Dianzi University. In 2016, he continued with a Master's degree in Insurance at Liaoning University. In February 2023, he registered for a PhD program in Finance at the Putra Business School, Universiti Putra Malaysia (UPM).



LIST OF PUBLICATIONS

- Luo, H., Kamarudin, F., & Mohd Nor, N. (2023). ICT and the dual banking efficiency nexus: A cross-country analysis with country governance moderation in GCC countries. *Cogent Business & Management*, 10(3), 2275366. <https://doi.org/10.1080/23311975.2023.2275366> (ESCI&SCOUPS)
- Luo, H., Kamarudin, F., & Nor, N. M. (2024). The impact of economic uncertainty on bank efficiency—The moderating role of country governance. *Heliyon*, 10(6), e27905. <https://doi.org/10.1016/j.heliyon.2024.e27905> (SCI Q1)
- Luo, H., & Kamarudin, F. (2024). Macroprudential policies and CO2 emissions: A comparative analysis of G7 and BRIC countries. *Plos One*, 19(1), e0296363. <https://doi.org/10.1371/journal.pone.0296363> (SCI Q1)
- Luo, H., & Sun, Y. (2024a). Effects of geopolitical risk on environmental sustainability and the moderating role of environmental policy stringency. *Scientific Reports*, 14(1), 10747. <https://doi.org/10.1038/s41598-024-60773-5> (SCI Q1)
- Luo, H., & Sun, Y. (2024b). The impact of energy efficiency on ecological footprint in the presence of EKC: Evidence from G20 countries. *Energy*, 304, 132081. <https://doi.org/10.1016/j.energy.2024.132081> (SCI Q1)
- Luo, H., Sun, Y., & Zhang, L. (2024). Effects of macroprudential policies on ecological footprint: The moderating role of environmental policy stringency in the top 11 largest countries. *Scientific Reports*, 14(1), 7423. <https://doi.org/10.1038/s41598-024-58015-9> (SCI Q1)