

IMPACTS OF BANKS' FINANCIAL
PERFORMANCE BEFORE AND DURING COVID-
19 PERIOD: A STUDY OF DOMESTIC ISLAMIC
BANKS IN MALAYSIA

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MALAYSIA

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Before and During COVID-19 Period:
A Study of Domestic Islamic Banks in Malaysia






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DECLARATION

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- (3) Equal contribution has been made by each group member in completing the FYP.
- (4) The word count of this research report is 26,692 words.

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LIST OF ABBREVIATIONS

BIMB	Bank Islam Malaysia Berhad
BKLQ	Bank Liquidity
BLUE	Best Linear Unbiased Estimators
BNM	Bank Negara Malaysia
CA	Capital Adequacy
CAR	Capital Adequacy Ratio
CLRM	Classical Linear Regression Model
CMCO	Conditional Movement Control Order
DOSM	Department of Statistics Malaysia
FEM	Fixed Effects Model
GDP	Gross Domestic Product
GLS	Generalized Least Square
IFRS	International Financial Reporting Standards
IFSB	Islamic Financial Services Board
IMF	International Monetary Fund
JB	Jarque-Bera
LCR	Liquidity Coverage Ratio
Ln	Logarithm
MCO	Movement Control Order

MORA	Moratorium
NPAs	Non-Performing Assets
NPL	Non-Performing Loan
NPM	Net Profit Margin
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squared
Pooled OLS	Pooled Ordinary Least Square Model
REM	Random Effects Model
ROA	Return on Assets
ROE	Return on Equity
SMEs	Small and medium-sized enterprises
SOP	Standard Operating Procedures
TOL	Tolerance
VIF	Variance inflation factor
WHO	World Health Organization

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ABSTARCT

This research project is to compare the performance of Malaysian Domestic Islamic Banks before and during the COVID-19 period. Besides, 11 Malaysia domestic Islamic Banks were chosen as the sample size, namely Affin Islamic Bank Berhad, Alliance Islamic Bank Berhad, AmBank Islamic Berhad, Bank Islam Malaysia Berhad, Bank Muamalat Malaysia Berhad, CIMB Islamic Bank Berhad, Hong Leong Islamic Bank Berhad, Maybank Islamic Berhad, MBSB Bank Berhad, Public Islamic Bank Berhad, and RHB Islamic Bank Berhad. External independent variable included in this study is gross domestic product (GDP), while internal independent variables included capital adequacy (CA), moratorium (MORA), and bank liquidity (BKLQ), whereas the dependent variable refers to return on assets (ROA). Furthermore, secondary data were collected for this study in quarterly basis from Bank Negara Malaysia (BNM) and quarterly financial report of each Islamic Banks. Random Effects Model (REM) is preferable in this study. The result of study shows that all the independent variables are significant to impact Islamic Banks' profitability before COVID-19 period while GDP is the only significant variable that affect the performance of Islamic Banks during COVID-19 period.

CHAPTER ONE: RESEARCH OVERVIEW

1.0 Introduction

Malaysia's financial system is a dual banking system, in which Islamic Banks and Conventional Banks exist at the same time in Malaysia. Malaysia Islamic Banking has been developed rapidly after its existence in the 1970s. Since Islamic Banks have been operating in Malaysia for more than 30 years, they have established a strong foundation in the country by bolstering the cornerstone of financial stability in terms of abundance, divergence, and maturity of the banking system. According to Bank Negara Malaysia (BNM, 2021), there are now 11 licensed domestic Islamic Banks and 5 licensed international Islamic Banks. The admission of foreign Islamic Banks into Malaysia banking sector and the formation of subsidiaries of Islamic Banks to compete with full-fledged Islamic Banks demonstrated a highly competitive banking industry in Malaysia.

Practically, the difference between an Islamic Bank and a conventional bank is that conventional bank operates under the traditional interest-based model, but an Islamic Bank operates as an intermediary under Shariah laws, which prohibits interest (riba). Both Islamic and conventional banks use different techniques to earn profit from different ways. For instance, interest was treated as income by conventional banks, however profit and loss sharing were used by Islamic Banks instead of interest. Thus, the Islamic Banking is distinguished by the absence of interest (Salman & Nawaz, 2018). Despite this, profits from Islamic compliance investments benefit Islamic Banks' depositors or clients.

Islamic Banking system is typically managed by Islamic laws, namely Shariah laws, which provide guidance for Islamic Banks to avoid forbidden actions such as interest payment (riba), gamble (maysir), and speculative trading (gharar) (Lee et al., 2019). This is the main concept of Islamic Banking in which mutual risk and profit sharing between parties should be practiced ensuring parties are treated fairly

(Irda Syahira et al., 2020). Moreover, Islamic Banks are progressively providing a wide range of financial services. It is known as Shariah compliance which includes capital mobilization, wealth management, assets allocation, insurance as well as services for payment and exchange settlement to fulfil the market and consumer demand. Due to these services provided, all Malaysians are now embraced and employed Islamic Banking and financial services. It leads the industry to a global model for a contemporary and dynamic industry (Siew & Shaikh Hamzah, 2015).

In recent times, Malaysia Islamic Banking industry has made significant contributions to the country's economy, especially in supporting small and medium size enterprises. It resulted in generating a positive impact on the structure of Malaysia economy. Since it helps to maintain the financial system's stability and promote Malaysia's economic expansion, the financial performance of Malaysia Islamic Banks is a crucial concern. However, the financial crisis has caused considerable influence on banking industry, notably the financial performance and profitability of financial institutions since the early twentieth century. For example, the Malaysia's loan market was harmed by the 2007 global financial crisis owed to the economy's grim outlook and a reduction in consumer confidence (Azira Abdul & Nurul Hazwani, 2019). As a result, the bank profitability was impacted significantly.

According to Umair et al. (2020), in December 2019, an unknown cause of influenza struck Wuhan, Hubei Province, China, and rapidly spreading across Asia and the world. Hence, the World Health Organization (WHO) designated it as health emergency of worldwide significance by January 2020. The cause of this disease has been discovered as a new coronavirus, which was then given the name COVID-19 by WHO. The rapidly spreading of COVID-19 caused havoc on every country in the globe. It has affected the corporate activities in every industry until the world entered a profound recession. Tourism, entertainment, transportation, manufacturing, retail, export-oriented, construction, finance, and other businesses have all been badly affected. However, due to the increased demand, businesses such as consumer technology, e-commerce, and health care thrived throughout the pandemic.

The strict policies adopted by government to inhibit the spreading of coronavirus throughout a nationwide, including social distancing, lockdowns, and national quarantines. These policies have led to an economic downturn around the world and caused globally economic recession, which quickly spread through financial markets (Mansour et al., 2021). Many industries were impacted severely by the COVID-19 outbreak especially the banking sector. Due to the severe impact of COVID-19, the society has lost purchasing power and the demand-supply balance has shifted dramatically (Fakhrunnas et al., 2021). As a result, several factors have caused dramatical change to the financial performance of banks such as economic growth (GDP), interest rate, consumers' savings, and loan applications or repayments. Thus, it is critical to determine the factors that influence bank financial performance and draw a comparison between the period before and during the pandemic. The purpose is to gain a better insight into the performance of banks under different market conditions. However, most of the related previous research were concerned on conventional banks or the major target country is Indonesia or Pakistan (Fakhrunnas et al., 2021; Chiahti et al., 2021; Supiyadi et al., 2019; Adelopo et al., 2018). Hence, this study is conducted to fill up the research gap in the context of Malaysia Islamic Banks.

1.1 Research Background

In year 2020, the outbreak of coronavirus has seriously affected almost all industries in Malaysia. It also includes Islamic Banking sectors who play a crucial role in banking sector, but they are exposed to high risk. There were numerous articles studying on the effect of COVID-19 on banking financial performance by comparing the conventional and Islamic Banks. In this study, the researchers will focus on the impact of Islamic Banking financial performance in Malaysia before and at the era of COVID-19. In Malaysia, to deal with the pandemic, the government established Movement Control Order (MCO) on March 18, 2020, by restricting the time and number of people from going out, as well as shops operation hours and number of workers operate in a company. In this situation, income of

citizens was generally decreased, unemployment rate increased, and it caused the poverty rate of Malaysia to be increased. In short, the government is limiting the economic activities by shutting down most of the business industries which bring several negative impacts to the country's economy. Thus, people started to lose the ability to repay their credit or financing to financial institutions since they do not have surplus fund on hand. According to the World Bank (2021), 5.6% of families from lower income group were undergoing indigence and their condition were getting worse due to rising cost of living and debt payables. The pandemic has reduced the purchasing power of the society and caused severe impact on the equilibrium of demand and supply.

Table 1.1:

Percentage change of GDP (%) from corresponding quarter of 2019 and 2020 in Malaysia.

	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	2019	2019	2019	2019	2020	2020	2020	2020
GDP	4.5	4.9	4.4	3.6	0.7	-17.1	-2.6	-3.4

Sources: Department of Statistics Malaysia (DOSM, 2020); DOSM (2021).

Table 1.1 shows the gross domestic product (GDP) changes from corresponding quarter in 2019 (before COVID-19 outbreak) and 2020 (during COVID-19 outbreak). According to DOSM (2021), Malaysia's total GDP in 2020 would be 5.6% lower than in 2019 which is only contracted for 4.3 per cent. Thus, International Monetary Fund (IMF) predicts that there will be a huge loss in GDP with the total amount of \$9 trillion internationally during year 2020 to 2021 (Gopinath, 2020). Declining GDP showed that the economy is deteriorating. The characteristics of declining GDP are the wage growths reduced and contraction in money supply. Furthermore, economists viewed a declining GDP as a sign of recession in the future. According to Qaisar Ali et al. (2018), GDP brings a positive impact on the

bank profitability. Hence, when the GDP rate started to drop drastically in the second quarter of 2020, it will affect the return on assets (ROA) of Islamic Bank to decrease accordingly.

Over the past 5 years, few previous researchers such as Muhammad & Triharyono (2019), Hassan and Kayed (2018) and Sulub & Mohd Salleh (2019), which have focused on examining the Islamic Banking financial performance before and during global financial crisis. Hence, to differentiate the condition of Malaysia Islamic Banking sector before and during the pandemic, 11 domestic Islamic Banks in Malaysia are being chosen and quarterly data in year 2019 and year 2020 have been investigated for this research.

Table 1.2:

List of 11 local Islamic Bank in Malaysia.

No.	Name of local Islamic bank	Ownership	Total assets in 2020 (RM'000)
1.	Affin Islamic Bank Berhad	Local	25,159,202
2.	Alliance Islamic Bank Berhad	Local	13,988,228
3.	AmBank Islamic Berhad	Local	51,255,993
4.	Bank Islam Malaysia Berhad	Local	74,637,022
5.	Bank Muamalat Malaysia Berhad	Local	25,767,869
6.	CIMB Islamic Bank Berhad	Local	116,282,403
7.	Hong Leong Islamic Bank Berhad	Local	42,894,675
8.	Maybank Islamic Berhad	Local	255,230,847
9.	MBSB Bank Berhad	Local	46,427,220
10.	Public Islamic Bank Berhad	Local	71,560,829
11.	RHB Islamic Bank Berhad	Local	86,890,826

Sources: (BNM, 2021); Islamic Bank Annual Report 2020

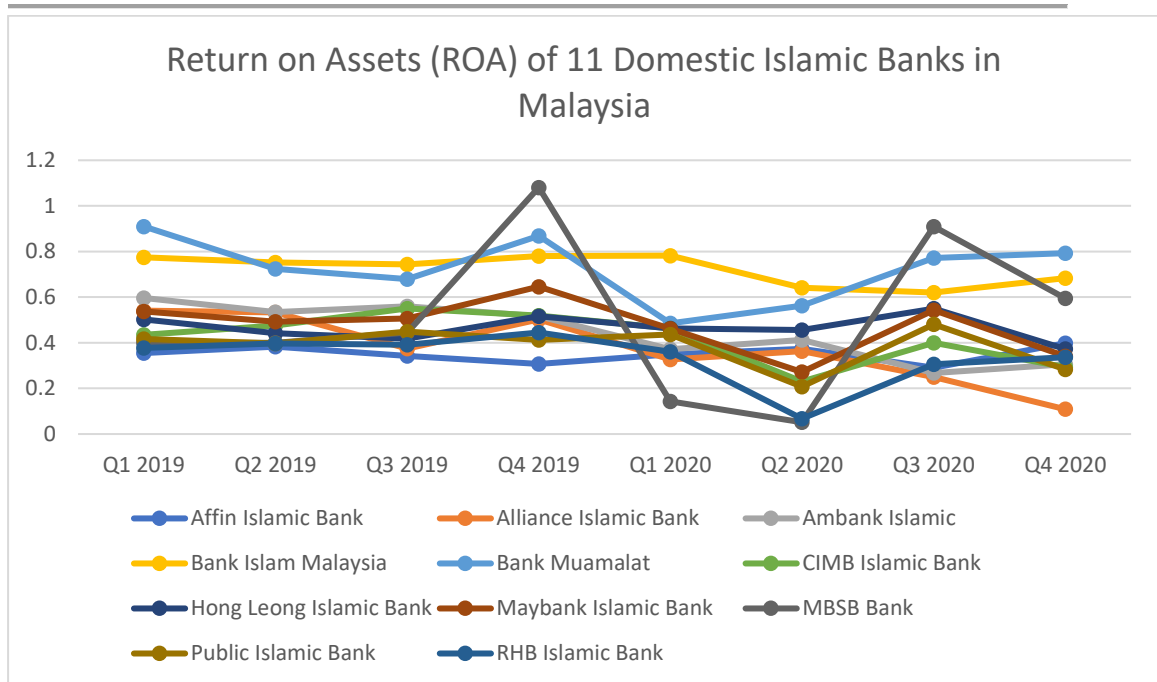


Figure 1.1. Return of Assets (ROA) of selected banks in Malaysia before and during the pandemic. Sources: Quarterly report of 11 Islamic Banks in Malaysia from 2019 Quarter 1 to 2020 Quarter 4.

From figure 1.1, this research focuses on 11 selected domestic Islamic Banks in Malaysia banking sector. It clearly shows the fluctuating trend of profitability of each of the Islamic Banks based on their ROA from first quarter of 2019 (before the pandemic) to last quarter of 2020 (during the pandemic). The net income of Islamic Banks has reduced during the pandemic. It is due to the reason people do not have surplus money to save in their bank account or make any investment in Islamic Bank. Furthermore, the bank profitability has decreased because of the increase in non-performing loans (NPL). There were more people default their loan during the pandemic as they lost their jobs which led them to unable to repay for loans. In addition, Islamic Banks mainly provide debt financing related to micro-financing and lending to small and medium-sized enterprises (SMEs). Hence, Islamic Bank may anticipate involuntary default incidences if the borrower's financial condition continues to become worsen, and it exceeds the relief period of moratorium and deferred payments. Since it is prohibited from interest (riba) in Islamic Bank, Islamic Bank will not charge any interest or penalties on deferred payment as their income (Haniffa, n.d.). Therefore, it results in decreasing of income of Islamic Bank during pandemic.

Furthermore, the government has implemented an assistance plan via a contract with local banks by permitting 2 options which is a 6-month moratorium or a 50% less in monthly loan repayment to the residence as well as SMEs (Bank Islam, n.d.). Their intention is to moderate the cash flow by creating a more flexible debt repayment plan for the issuer during the pandemic period. Since it is being controlled by the government, Islamic Bank in Malaysia has no way to reject but to obey. In Malaysian point of view, the moratorium plan is to assist the individuals & SMEs by relieving their financial difficulties in terms of instalment of loan, but it causes the Islamic Bank to incur modification loss which result in the declination of ROA (Amir Shaharuddin, 2020). Besides, the modification loss of Islamic Bank is due to a short-term termination in one's periodical instalment of loans paid to bank, and thus causing the bank to loss (Almonifi et al., 2021). As a result, Islamic Bank that owns high portion of leasing (ijarah) will be seriously impacted by moratorium (Syahirah Syed, 2020). Since the additional accrued payment that incurred during the moratorium will be charged back on its client loans later, the borrower is required to pay for additional payment after the moratorium ends and it caused massive arguments arose from public. Thus, the Ministry of Finance Malaysia urged all local banks to prohibit in collecting any extra instalment income from the loans ("Banks Step Up Measures," 2020). As a result, Islamic Bank incurred a declination in its ROA in year 2020 (during pandemic) as compared to 2019 (before pandemic) which is before the implementation of moratorium plan. Government is recommended to plan a new strategy so that it would benefit the banking industry and the public at the same time.

Besides, moratorium issued by government specified that all the deferment of payment and loan will be automatic, therefore Islamic Bank will face liquidity crunch in the near future which triggered by the reducing of cash inflow and drying up their liquidity during the pandemic. Islamic Bank might find themselves struggling in meeting the minimum liquidity requirement. In order to allow the financial institutions including Islamic Bank to cope and navigate with the loan moratorium, BNM has lowered the minimum regulatory requirement for liquidity.

It helps Islamic Bank to continue lending out to creditor, meanwhile maintaining their liquidity needs during this stressful period (Deloitte, 2020).

Moreover, during COVID-19 period, Islamic Banking industry faced difficulties in terms of their main operations which is declination in lending activities due to a reduction in individuals' or businesses' demand for loans since the major lockdown indirectly forced some businesses to shut down (Muhammad Anif, 2021). Hence, the role of Islamic Banks' sufficient capital adequacy is relatively vital as it acts as a buffer in absorbing default risk and affecting its profitability. Sufficient banks' capital adequacy could secure the soundness of the financial system and enhance the banking performance. Sufficient capital adequacy is essential for Islamic Bank so that more funds are available to absorb any financial shocks and it will assist Islamic Bank to survive longer even during COVID-19 pandemic (Mateev et al., 2021).

Most of the studies concluded that there is an unfavorable effect of the pandemic on the banking sector. However, the Malaysia Islamic Banking sector is facing lesser burden as compared to the challenges faced by commercial bank in Malaysia when the pandemic hits. Generally, the reason is because of the idea applied by the Islamic Bank where mutual risk and income are depending on the possibility of earning and losing which allowed Islamic Bank to be unique. Until December 2019, the assets value of Islamic Banking already stood at RM835.91 billion which is 38% of the overall banking industry deposits that could assist in the recovery plan of Malaysia economy (BNM, 2019). Moreover, the official statement from Fitch Ratings injected confidence to the public by claiming that Malaysia economy will be boosted up by the Islamic Banking industry regardless of the difficulties arise from the pandemic (Fitch Ratings, 2021). Thus, there is an increasing number of countries adopting the concept of Islamic Bank instead of commercial bank only (Salman & Nawaz, 2018). Besides, Islamic Banking is considered as a safe location for the depositors and investors since it does not involve high-risk investment. So, when crisis hits, Islamic Bank has higher sustainability as compared to conventional bank (Hassan & Kayed, 2018).

In this study, it focuses on how gross domestic product (GDP), capital adequacy (CA), moratorium (MORA), and bank liquidity (BKLQ) affect the ROA of the Islamic Bank by examining on the period pre-COVID and at-the-COVID epidemic. This research also concentrates on the comparison of Islamic Banking financial performance before as well as during pandemic. It will benefit the potential readers which include the government and Central Bank, financial institutions, potential investors and stakeholders, and future researchers by referring to this study.

1.2 Research Problem

Upon establishment of Bank Islam Malaysia Berhad (BIMB) in 1983 and continuous development, Malaysia Islamic Bank has become the second greatest country in term of the number of Islamic Banks by having 16 Islamic Banks (Puri-Mirza, 2021; BNM, n.d.). Due to the rapid growth in the past 30 years, Malaysia Islamic Bank has occupied nearly 40% market share in term of assets with the amount of USD 254 billion (BNM, n.d.; Lo & Leow, 2014; Raj, 2020). Other than that, Malaysia Islamic Bank is being forecast to consume 50% of market share in the near future (Association of Islamic Banking and Financial Institutions Malaysia, 2021). However, there is lack of studies for a certain country especially Malaysia. Most of the previous studies were focusing on the whole region such as post-Soviet country (Yuksel et al., 2018) or European Union (Boitan, 2015; Petria et al., 2015). Thus, it caused the researchers to face difficulties in accessing sufficient information from a certain country such as Malaysia. Besides, most of the previous studies were focusing on commercial bank since they owned higher market share as compared to Islamic Bank in Malaysia (Trofimov et al., 2018). Due to lack of supported studies on Islamic Bank in Malaysia, meanwhile Malaysia Islamic Bank is enjoying the increment of influences and significant growth in term of market share, it motivates this study to adopt Malaysia domestic Islamic Banks as the targeted sample (Saleh, 2018).

In the past, Malaysia banking system was suffered from Commodities Shock 1986, Asian Financial Crisis 1997, and Global Financial Crisis 2008. Currently, Malaysia

banking system is suffering from another black swan event which is known as COVID-19 crisis. The COVID-19 epidemic has turned into a health, social, and geopolitical disaster of unprecedented scope and magnitude. The first case of COVID-19 was detected in Malaysia on the January 25, 2020. Situation in Malaysia was getting worse owing to the fact that the government only started to take action in early March 2020. They imposed the first MCO on March 18, 2020 to disrupt the spread by limiting mobility and interaction. The MCO issued stay-at-home orders, prohibited outdoor activities including interstate travel and temporarily closed all enterprises include banking industries, with the exception of a few selected vital services and the natural resource sectors. A decision to considerably loosen rules and Standard Operating Procedures (SOP) by May 4, 2020 under a Conditional Movement Control Order (CMCO) to another outbreak of illness. It caused more movement controls were being imposed during the year 2020 and 2021 and Malaysia was grappling with a huge debt problem, financial constraints, plummeting oil prices, and the ripple effect of the global shutdown on businesses and tourisms (Elengoe, 2020).

Additionally, COVID-19 crisis has affected Malaysia Islamic Banks financial performance. This impact can be explained through these few forms of repayment flexibility that is available for borrowers such as SMEs, whose viable businesses may have suffered cash flow challenges or difficulty in repaying debts. They might extend the loan term to reduce monthly payments and concur to other flexibility until borrowers could restart full repayment. However, considering that banks' reliance on deposits, borrowed capital, and shareholder funds for the bulk of their funding, the loan moratorium and repayment flexibility can result in insufficient cash to meet their primary duties, such as lending and investing. Banking institutions also require cash for defensive assets and reserves in order not to trigger liquidity risk. The effect of epidemic can be seen by banks in reduced growth rate of loan, profitability, provisions, and liquidity. In addition, the inclusion of social distancing and compliance task may provide major issue for banks in moving their newly planned distribution networks (Khoo, 2020). Moreover, consequences of COVID-19 crisis are far greater than Global Financial Crisis 2008 (Organisation for Economic Co-operation and Development [OECD], 2020). Thus, it raises the

public and researchers' concern on Malaysia domestic Islamic Banks' profitability and their ability to sustain during this situation.

In addition, past studies examined the impact of bank financial performance by focusing either before or during COVID-19 period only. According to Saleh (2018), the research was conducted in Kenya Commercial Bank performance before COVID-19 period while Gautam (2018) has studied Commercial Bank performance in Nepal before COVID-19 period from 2006 to 2016. Nevertheless, although there were a few studies conducted on during COVID-19 period, those studies faced shortage of data in quantitative analysis which unable to provide more accurate result. Studies of Hladika (2021) on the impact of COVID-19 in Croatia Bank profitability faced such difficulty as lesser annual report being published which is necessary for his studies. The previous researchers were unable to implement quantitative analysis due to lack of moratorium data. This is because moratorium was being introduced for the first time in some countries in order to cope with COVID-19 pandemic. For instance, studies of Amir Shaharuddin (2020) and Drabancz et al. (2021) explained the impact of moratorium in Malaysia Islamic Banks and Hungary banks' profitability from theoretical view without quantitative analysis due to data shortage. Therefore, researchers are being motivated to analyse the impact of Malaysia Domestic Islamic Banks' performance before and during COVID-19 period by utilizing quantitative analysis and larger sample size due to greater data availability.

The previous studies were strongly focused on the internal factors that affect banks' financial performance, primarily on the CAMEL model for measuring internal performance, and ignored other external variables that can be used to measure bank performance. Another major weakness of the studies is data constraint. The majority of commercial banks on the window model do not make their financial statements available for public consumption. Several banks under investigation openly refused to disclose their data, which caused researchers to be forced to rely on the combined financial accounts of both conventional and Islamic windows. Due to the distortion of the statistics, the analysis is distorted (Saleh, 2018). Given that local banks do not disclose their prepared financial statements with the public, researchers,

policymakers, and potential investors would have a difficult time in accessing the statements for personal use (Mohammed Ayoub & Mohammed Mekidiche, 2020). However, understanding the other factors that will affect a bank's financial performance is also important for all parties that involved, including management, customers, and regulatory bodies. Thus, the problem of previous studies which mostly focusing on the CAMEL factors and ignoring those external factors such as gross domestic product (GDP) will be included in this study as this factor is important to Islamic Banks. Secondly, the problem of data constraint will be solved in this study since all the data will be extracted from the Central Bank and published annual report of the Islamic Banks in Malaysia.

It is necessary to study the impact of Malaysia Islamic Banks' financial performance before and during COVID-19 period by examining the relationship between Return on Assets (ROA) and 4 independent variables, namely Gross Domestic Product (GDP), Capital Adequacy (CA), Moratorium (MORA), and Bank Liquidity (BKLQ) before and during COVID-19 period. GDP is significant because it provides information on the size and performance of an economy. GDP growth is primarily used as a measure of the economy's overall health as bank's financial activities, performances and systems are always related to the country's economy condition. The effect of this variable is not restricted, as during downturn of economy or financial crisis that happened in 2008 has caused the whole banking sector to lose money on mortgage defaults, causing interbank lending to halt and the dry up of credit to individuals and companies (Ahmad Al-Harbi, 2019). After 13 years of time, COVID-19 pandemic happened, the urge to know if the economy condition will still affect bank's financial performance is so big. Different economic growth backgrounds lead to different bank businesses, which has an impact on bank performance rating. As a result, GDP growth as an exogenous variable makes the model more logical and the banking performance measurement becomes more reliable. Thus, GDP is important to be used as a variable to know more about the effect of changes in economy condition towards bank's financial performance during pandemic and before pandemic happened.

Capital adequacy is defined as a level of capital that enables banks to absorb losses while still having sufficient cash to sustain and operate on a continuous basis (Mohd Afzanizam et al., 2021). Mohd Afzanizam et al. (2021) pointed out that capital adequacy of banks is one of the determinants of the economic volatility of a country. In other words, capital adequacy of banks is critical in maintaining and stabilizing the financial sector. Basically, when banks are able to maintain the sufficiency of capital, banks will be able to cope with market uncertainties or deal with different risks in order to safeguard depositors and creditors. However, the outbreak of COVID-19 pandemic has a huge impact on the stability and strength of financial sector in the world, including Malaysia banking sector. According to Mohd Afzanizam et al. (2021), BNM allows the banking institutions to lower down the Liquidity Coverage Ratio (LCR) to below 100 percent during the pandemic period, which caused the banks to experience liquidity risks undoubtedly as a result of lacking fund to support their operation as well as provide loans on time. In this condition, banks' profitability will be affected. Thus, it is a curiosity for researchers to find out how the changes in the level of capital of banks before and during the pandemic bring different impacts on the financial performance of the banks. Hence, capital adequacy shall not be ignored as a determinant in this study.

Whereas, loan moratorium refers to a financial relief, which allows loan borrowers for not repaying any loan instalments for a temporary period. According to Mehta and Kaul (2020), moratorium is frequently imposed in reaction to a crisis scenario. Because of the COVID-19 lockdown issue, all the government in the globe have been concerned about the loan repayment and financing since the pandemic severely affected many individuals and businesses in term of incomes and revenues. In light to cope with this, Malaysia government has introduced the six-month loan moratorium with the condition of not imposing late payment charges or penalties to lessen the burden of people and businesses. This measure will benefit the borrowers, but there are arguments if this facility will impact the profitability of banks. Based on the research of Mehta and Kaul (2020), the moratorium offered results in a significant number of bad loans and brought negative impact on the stability of banks and consequently their capacity to lend. Moreover, the profitability of India's banking sector was likely to fall as compared to previous year due to deteriorating

assets quality and dropped in interest margins (Mehta & Kaul, 2020). Hence, will Malaysia banking sector face these same challenges is a worth discussing topic, so moratorium should be included as an independent variable in this study.

Lastly, bank liquidity is responsible for the growth of banking sector of a country, including Islamic Banking sector. Sometimes, due to poor liquidity management, liquidity crisis may happen, and it will affect the performance and growth of the whole banking sector of a country (Ugoani, 2015). According to Karim et al. (2021), coronavirus could lead to liquidity crisis. Liquidity crisis refers to a condition where many financial institutions are lacking cash or easily-convertible-to-cash assets on hand simultaneously to meet their due obligations (Walters, 2020). During the pandemic, reservation of money may be the decision of individuals and companies since they might feel anxiety due to not generating income or additional cash further (Karim et al., 2021). These in turn to high default risks to the banks and may even cause to bankruptcies. Yet, bank liquidity is important for raising funds and earning credit, determining good decisions, emergency used as well as to smooth the functioning of the financial system. Thus, bank liquidity must be included while identifying the impacts of different variables on bank's financial performance before and during the crisis occurred.

This study is important to government and Central Bank of Malaysia, financial institutions, investors and stakeholders, and future researchers. The study's findings will act as a guideline for the Malaysian government and Central Bank to modify their fiscal and monetary policy appropriately that serve the best for the bank and public by doing economic forecast. Besides, this study will benefit financial institutions as they will be able to make sharp decisions towards the ongoing COVID-19 crisis and future financial crisis which will ensure long run sustainability within banking industry. Investors and stakeholders will be able to determine the direction of the bank performance before and during COVID-19 with the knowledge of knowing the potential factors that are affected by the normal economy and the pandemic period. Moreover, it will be advantageous for future researchers since this paper gives a detailed understanding on the impact of Malaysia Islamic Banks' financial performance before and during COVID-19

period. It will reduce their workload in conducting similar area of research. Furthermore, in this research, the research data will be gathered quarterly from 2019 (before COVID-19 period) to 2020 (during COVID-19 period) since Malaysia is suffering COVID-19 pandemic from 2020. Lastly, 11 Malaysia Domestic Islamic Banks will be included in the sample size as well.

1.3 Research Objectives and Research Questions

In this section 1.3, it addresses the purposes of the study. Furthermore, it helps to provide the readers and researchers with specific, concrete and achievable objectives.

1.3.1 Research Objectives

In this subsection, the general and specific objectives will be discussed in more details.

1.3.1.1 General objective

The general objective of this study is to examine the factors that significantly affect the financial performance of Malaysia Domestic Islamic Banks before and during the COVID-19 period.

1.3.1.2 Specific objectives

- i. To identify the relationship between gross domestic product (GDP) and Malaysia Domestic Islamic Banks' profitability before and during COVID-19 period.

- ii. To identify the relationship between capital adequacy (CA) and Malaysia Domestic Islamic Banks' profitability before and during COVID-19 period.
- iii. To identify the relationship between moratorium (MORA) and Malaysia Domestic Islamic Banks' profitability before and during COVID-19 period.
- iv. To identify the relationship between bank liquidity (BKLQ) and Malaysia Domestic Islamic Banks' profitability before and during COVID-19 period.

1.3.2 Research Questions

The study aims to determine which variable will significantly influence the financial performance of domestic Islamic Bank before and during COVID-19 period in Malaysia.

- i. Does gross domestic product (GDP) have significant relationship with domestic Islamic Banks' financial performance before and during COVID-19 period in Malaysia?
- ii. Does capital adequacy (CA) have significant relationship with domestic Islamic Banks' financial performance before and during COVID-19 period in Malaysia?
- iii. Does moratorium (MORA) have significant relationship with domestic Islamic Banks' financial performance before and during COVID-19 period in Malaysia?
- iv. Does bank liquidity (BKLQ) have significant relationship with domestic Islamic Banks' financial performance before and during COVID-19 period in Malaysia?

1.4 Research Significance

Banks' financial performance is crucial to determine the market growth as well as economy of a country, especially when the pandemic hit into the world severely. Profitability of banking industry is important to give a direction of economic growth. The paper studies the determinants that have a significant influence on the performance of local Islamic Banks before and during the COVID-19 within Malaysia.

The research acts as a guideline for government and Central Bank to depend on the results of the study to anticipate the fluctuation in the economy and economic growth in the following year to make modification on the current economic forecasting policies. They can rely on economic forecast to determine the fiscal and monetary policies by referring to this study. It will help them to have better understanding about the current financial health and stability condition. This study allows them to make accurate decision whether it is the time to make economy recovery and reformation. Government involvement in Islamic Bank performance is critical since the government serves as a role in governing a whole country's economy.

Besides, financial institutions will be able to acquire a clear understanding on how capital adequacy and bank liquidity will influence the bank's prospective earnings during the epidemic. By referring to this study, financial institutions can make comparison and devise better solutions to problems that may arise before and during the epidemic, and thus can improve banks' financial performance by making every financial transaction a precise and informed decision. Also, financial institutions could plan for future operating activities by referring to this study.

Moreover, this study will be influential for potential investors and stakeholders such as borrowers, lenders, and employees who are interested in participating in financial operations with local Islamic Banks. This study allows them to have a clear observation on the different reactions of Islamic Banks towards the pandemic. They can refer to the financial performance of local Islamic Banks before and during the

COVID-19 period, as a value-added measurement in making wise investment decision to generate comfortable return and prevent unnecessary losses.

Lastly, this study will facilitate and act as a guidance for academic purpose by showing the differences between each variable in impacting the financial performance of banking industry. Particularly, it provides a comprehensive understanding of Malaysia local Islamic Bank financial performance before and during COVID-19 period to the future researchers on similar topics and they can decide what variables should be taken. This is because COVID-19 is happening in two years' time and still on going, so this study will serve as a springboard for other researchers to conduct the similar studies.

1.5 Chapter Layout

There will be five different chapters in this research which illustrated in the following:

1.5.1 Chapter One: Research Overview

This chapter goes with the details of the introduction of this study, which consists of background of this study, research problem, objectives of this research, questions which developed by researchers for this study and research significance as well as chapter layout.

1.5.2 Chapter Two: Literature Review

This chapter reviews and analyses the relevant past literatures which is relating to all chosen variables. Study of the theoretical models done by previous researchers, review of variables, propose theoretical framework

and hypothesis formulation are critically discussed as well. Basically, this chapter explains the basic concept of a theoretical framework for determining the relationship between variables.

1.5.3 Chapter Three: Methodology

This chapter includes the explanation of methodologies utilized to carry out this study which refer to research design, sample design, ways in collecting sample size, and tool that have been adopt for analyzing. This part also provides a complete picture of how this study is conducted.

1.5.4 Chapter Four: Data Analysis

This chapter delivers the final research outcomes and findings that are pertinent to the research questions and hypothesis developed. It entails researching the significant and insignificant effects of independent variables as well as dependent variable on the Malaysia Islamic Banks.

1.5.5 Chapter Five: Discussion, Conclusion and Implications

This chapter concludes an overview of chapter 1 to chapter 4. Limitations of this study and recommendations for future studies will also be discussed in this chapter.

1.6 Conclusion

In conclusion, this chapter mainly discusses the background of the research topic. The objective of this research paper is to study the impacts of different independent

variables on the profitability of domestic Islamic Banks before and during COVID-19 period in Malaysia. It concerns the relationship among the variables that can provide different effects in Malaysia's Islamic Banking sector. The linked factors and theoretical framework will be further explored.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

Previous studies which related to this study will be explained in this chapter. Besides, financial accelerator theory, buffer theory, credit default theory, and commercial loan theory will be discussed and applied to support the relationship of variables from theoretical perspective. In addition, this chapter also includes literature review about return on assets (ROA), gross domestic product (GDP), capital adequacy (CA), moratorium (MORA), and bank liquidity (BKLQ). Last but not least, this chapter will illustrate conceptual framework and hypothesis development as well.

2.1 Theoretical Review

This section includes related and relevant theories that will be applied to express the relationship between GDP, CA, MORA, and BKLQ with ROA. Theories that will be discussed in this section are financial accelerator theory, buffer theory, credit default theory, and commercial loan theory.

2.1.1 Financial Accelerator Theory

Financial Accelerator Theory was proposed by Thomas Nixon Carver and Albert Aftalion in 1903. According to Carver and Aftalion (1903), this financial theory that is related to Keynesian concept stipulates that capital investment outlay is a function of output. In the credit market, it also employs a principal-agent technique to evaluate the costs incurred by lenders (banks) in obtaining information on risks, features, and borrowers' behavior. For example, as measured by GDP, a rise in national income

would result in a proportionate increase in capital investment spending which leads to more borrowing.

According to Bernanke (1983), this theory is a means by which development and performance of financial institutions are affected by the impact of changes in the economy growth. Bernanke (1983) also claimed that if there is a rapid economy growth, goods and services demand will keep rising at tremendous and rapid pace. Firms respond to the increase in demand by boosting output and utilizing their current production capacity to the fullest extent possible. Some businesses respond to increased demand by selling off existing inventories, so eventually when they faced some liquidity issues, taking loans is an effective way to cope with their problem.

Financial accelerator theory is proposed to explain most of firms and individuals have overextended themselves to various degrees during the peak of business cycles. This implies that they have taken on low-interest loans to fund renovations and expansions to their business and lifestyle. It also means that they are more susceptible to change in the credit environment at this stage in the economic cycle than they would be at other times. When the peak phase of the business cycle ends, the same overextended majority will hit with a weaker economy and tighter credit (Kiyotaki & Moore, 1997).

2.1.2 Buffer Theory

Buffer theory was proposed by Calem and Rob in 1996 and it was applied by several past researchers such as Olatayo et al. (2019); Udom and Onyekachi (2018) and Ikpefan (2013) when examining CA and ROA. This theory estimates that when a bank is fulfilling the legal capital reserve requirements set by the countries' Central Bank, it may create an inducement for the bank to enhance its capital and prevent the banking institutions to involve in high-risk investment. This is because the financial

institutions will face penalty if there is any violation on the capital reserve requirement. Banks are recommended in owning capital buffer when there is fluctuation in Capital Adequacy Ratio (CAR) (Udom & Onyekachi, 2018). On the other hand, banks with insufficient capital may be persuaded to invest in high-risk investment that will generate high return to boost its capital. During economic downturn, people tend to avoid deposit fund, and thus banks need more money to maintain its daily operation and keep as reserve. Buffer theory emphasizes the importance of capital adequacy as capital level of bank will determine the confidence level of the public in banking institutions (Udom & Onyekachi, 2018). According to the past studies, if banks hold sufficient capital during financial crisis or COVID-19 pandemic, it will enhance the banking financial performance as Islamic Bank need capital to cope with daily operations and investment risks, especially after the government implement the moratorium plan. Therefore, this study will prove similar views with the authors from Malaysia context.

Moreover, in Malaysia Islamic Banking sector, banks are required to follow the minimum legal capital reserve requirements set by The Basel Accord (1998) and Islamic Financial Services Board (IFSB, 2005) to avoid bankruptcy. Tight capital requirements regulations are created to urge banks to reserve higher amount of capital than Basel Committee required. This is because Islamic Bank might face higher risk due to the implementation of Shariah principle. In short, there will have hurdles for Islamic Banks to fulfil the reserves requirement after the bank moratorium is implemented during the COVID-19 pandemic.

Buffer theory explains that if a bank holds adequate capital, it will lead to high ROA and it indicates that the financial condition of the bank is healthy and stable. Besides, tighter regulations set by IFSB (2005) will influence the Islamic Banking sector to be more stressful than the conventional bank, especially during the financial crisis since Islamic Bank need to reserve higher amount of capital. Therefore, this brings up the objective of this

research towards the Islamic Banking sector financial performance and the capital adequacy during the COVID-19 pandemic.

2.1.3 Credit Default Theory

A journalist proposed such concept during the year 2007 (Sy, 2007). According to Sy (2007), he illustrated the main objective of this theory as it allows effective prediction of losses from loaning after reviewed and examined the previous credit hazard models where it is crucial towards the stabilization of economic system. Based on the statement provided by Sy (2007), he stated that the reasons are due to such theory can solve various limitations of previous theories which include historical sampling bias, and it is caused by absence of qualities and enormous information which pose obstacles in conducting statistical estimation. Moreover, credit default theory solves another limitation where it is the only theory that is able to quantify the credit risk when the market environment alters quickly.

Furthermore, under the research paper of Sy (2007), he stated delinquency and insolvency occurred at the same time and caused credit default to occur. He presumes delinquency unilaterally causes insolvency which then leads to credit default. Besides, delinquency indicates borrowers are facing liquidity problem and causing them unable to fulfil their debt obligation, whereas insolvency refers to borrowers are having higher liabilities as compared to their assets which pose a risk of bankruptcy. Furthermore, under this theory, risk factors will not be included if those factors are unable to affect delinquency and insolvency casually.

Last but not least, credit default theory is related to this study since moratorium enhances banks' non-performing assets (NPAs), an indicator of banks' credit risk which will directly impact the banks' profitability. This is because increment of NPAs positively heightens liabilities while on the

other hand, it reduces interest income which is one of the ways for banks to make profits.

2.1.4 Commercial Loan Theory

This theory had been proposed by a journalist namely Adam Smith. According to Kajola et al. (2019), commercial loan theory states that a bank can improve its liquidity by providing short-term self-liquidating loan to customers. Loans can be self-liquidating when the return of loan is able to cover the cost of original loan. For instance, bank may provide loans to customers for the purchasing of automobiles in advanced. Then, this theory stipulates that loan can be self-liquidated when the customers sold off his/her automobiles and the proceeds earned are used to pay for its repayment of loan (Bencharles & Abubakar, 2020). Commercial loan theory can be applied in order to improve liquidity, especially during COVID-19 where most of the financial institutions are facing financial burden.

Furthermore, the most liquid loans that a bank can make is the short-term loans advanced that are used for the production or consumption of saleable goods. They can be self-liquidated because the goods can be sold at a later date. According to Elsharif (2016), in the study of "The Impact of Liquidity Management on Profitability", he stated that in this theory, the bank does not lend money to those who need it to purchase real estate or invest the loan in stocks or bonds. It is due to the long period of expected return in investment, whereby it is contrary with the theory which encourages short term loan and return instead (Roussakis, 1997). Therefore, if a financial institution wishes to improve their liquidity by applying this theory, they should consider of short-term loaning.

According to Mohamed Aymen and Boubaker (2020), they also mentioned that the Central Bank should lend the security of short-term loans to the bank in order to allow the bank to keep optimal liquidity and regulate money

supply. In this commercial loan theory, it will benefit a bank with the fact that such loans are less likely to become a bad debt since it has a short maturity and a productive ambition. Therefore, bank will be protected from the risk of bad debt and its profitability will not be reduced. The strength of this theory is that those loans that are high in their productivity could provide higher return for the bank, and result in higher profitability. Hence, based on this theory, it provides optimal liquidity for a bank, meanwhile, an adequate liquidity is positively related to bank's profitability.

2.2 Literature Review

This section includes related and relevant literature review that expresses the dependent variables, namely ROA and the relationship between independent variables which include GDP, CA, MORA, and BKLQ.

2.2.1 Return on Assets (ROA)

This research adopting ROA as a tool in measuring the effect shown from the independent variables on Islamic Banking profitability before and during the crisis. ROA is computed by dividing the earnings after tax with the mean of banks' aggregate assets which indicate that the surplus earned per dollar of banks' property (Lee et al., 2019). It measures how much of the returns based on the funds invested by equity shareholders, total debt and also preferred shareholders. In ROA, it will also be needed to add the interest expenses in the net income since there is an inclusive of debt financing. Thus, ROA acts as a proxy in measuring the banks' capability in earning revenue from its assets. Although there are several financial ratios which act as a proxy of banking profitability level such as NPM and ROE, but ROA has been widely used by most of the researchers because the results of ROA have clearly shown the contrast between the cost-effectiveness and

serviceable accomplishment of each bank as it emphasizes on the yield earned from the assets capitalized by the bank.

Moreover, ROA is claimed to be the most important and significant tool in measuring the banking financial performance. Yolanda (2017) pointed out that ROA is considered as the capability of each Islamic Bank management in earning and creating a surplus. Supporting with Halmawati (2019); Ikhsan et al. (2019) which claimed that ROA is used as a dependent variable as the larger the ROA of a bank, it indicates the higher the banks' accomplishment in its profitability level and the more strength of the financial stability of the bank in utilizing its assets. The level of ROA also reflects on the professionalism and supervision of the banks' managers in performing on how his/her management skills effectual and constructive on the utilization of banks' asset, especially dealing with the crisis. In addition, according to previous authors, Islamic Banks financial performance before COVID-19 pandemic is better than the period during the pandemic because of the bank moratorium strategy introduced by government where it benefits on the residence but not the banking sector. Thus, Islamic Banks faced more challenges during COVID-19 period as compared to before COVID-19 period.

According to Mongid (2016), ROA is preferred by the researchers because it measures resource allocation as well but instead, ROE is more suitable for investors. It further supported by Olatayo et al. (2019), they mentioned that the best measurement on banks' efficiency in utilize their assets in exchange of revenue is ROA. In the research conducted by Bandt et al. (2017), they used ROA to measure bank profitability as well since it embodies all the factors that contribute to banks' profit. ROA has been widely used because it is not misrepresented by high leverage ratio while ROA relies on strategy taken by banks in making judgement whereby considering the uncontrollable variables which are inflation and nations' legal ruling. (Setyawati et al., 2017). Thus, during COVID-19 pandemic, the bank moratorium has become a focal point for the banking industry in

maintaining its profit and fulfilling the policies implemented by government. Therefore, ROA is being used widely by the previous authors in explaining Islamic Banks' profitability during the pandemic period.

Moreover, Islamic Bank plays a crucial role as much as commercial bank by providing financing through equity or debt. However, equity-financing seems to be lesser implied despite its compliance to Shariah. According to Maikabara (2019), the reason behind is that debt-financing such as Musharakah and Mudharabah are having low risk, capital guarantee, lack of awareness among the public in equity financing in Islamic Bank and other issues. Hence, debt-financing such as Murabahah and Bai'-Bithaman Ajil are more commonly used by most of the Islamic Bank. Therefore, ROA is more suitable as compared to ROE in determining financial performance in Islamic Bank since they are commonly applying debt-financing. In short, according to the recent articles, during COVID-19, poor banking financial performance have been observed in the middle east region. Thus, this study will prove the same perspective with the other authors from Malaysia context.

Independent Variables

2.2.2 Gross Domestic Product (GDP)

GDP growth rate often indicate a country's healthiness in term of economic activities and production. According to Yuksel et al. (2018), they discovered that during bad economic condition in post-Soviet country, individuals are in a bad condition as a lot of people without job, income and asset. However, they are allowed to take the loan so eventually these individuals will face difficulty in repaying the loan which reduces the bank's lending operations and brings the bank less profit.

Based on Olokoyo et al. (2019), GDP growth is positively affected bank performance after adopted Nigeria data. It explained by when a country's

trade and productive capacity increases, real incomes rise, and banks will become more confident in lending to clients and other banking operations. As output increases, incomes rise and demand for products and services will rise. In the sense that banking system is a part of the economy, improvements in important areas of the economy would result in higher returns on the productive activities that banks engage in and fund. These results and explanation are also supported by Djalilov and Piesse (2016).

According to Borio et al. (2015), the researchers stated that GDP tend to have a positively correlated relationship with the profitability of bank. GDP growth is a measurement of economic condition which numerous effects, one of which is improved performance of the banks. During good economy condition, both the increment in customer deposits and loans granted will have positive impact on bank profitability. High customer deposits will increase capital for the bank to investment and lead to higher return. According to Gautam (2018), a positive relationship is found as a higher GDP is considered as an indication of increase in purchasing power and the ability of investors increase to invest in stocks leading to increase of ROA. According to Mendoza and Yue (2008), they stated that the greater the GDP, the higher the bank profits. The risk of default is higher in downturn, and so bad debt will be higher. An increase in GDP growth resulting in improving the performance of Islamic Banks. According to Siew and Shaikh Hamzah, (2015), they did research on the influence of GDP on the profitability of Malaysia's Islamic Banks and found that GDP had a strong positive effect on ROA. Based on Bouzgarrou et al. (2018), they found a positive relationship during good economic condition and a negative relationship during financial crisis. They explained that no matter how good or bad the economic condition is, an experienced banking institution will be able to cope with the situation as they adopt good managerial and operational skills. Their findings were explained by the fact that experienced banks can improve themselves by upgrading technology and applying prudential practices.

On the other side, there are some researchers came out with negative relationship and explained that lower GDP rate which is in a bad economic growth condition will lead to lower banks' profitability. According to Tan and Floros (2012), they argued that in China, GDP growth was found to be significantly and negatively correlated with bank profitability. This finding supports the theory that increasement in economic development enhances the business environment and reduces bank entry barriers. Consequently, the increasing competition will lead to lower bank's profitability. Additionally, in the instance of commercial banks in the UK, Muhammad Sajid (2014) revealed that GDP growth is inversely related to profitability of banks. He claims that countries with a high GDP frequently have a more developed banking sector, which leads to higher levels of profit competitive. This explanation is supported by Yanikkaya et al. (2018), as higher competition can reduce bank profitability, and therefore, a negative correlation between GDP and banks' profits can be expected. According to Robin et al. (2018), the researchers explained that during economic downturns, policymakers would force banks to loosen lending laws in order to boost the economy, resulting in borrowers' borrowing criteria being loosen. This leads to have more borrowings at lower interest rate which resulting in higher demand of loan service. Therefore, high demand of loan will occur and lead to higher profitability of the bank even economy is going down. This result and explanation are also supported by Mohamed Khaled and Mohammad Alchami (2014). According to Combey and Togbenou (2016), they investigated the factors that affect bank profitability in Togo, and they discovered that economic growth which known as GDP is adversely related to banks' profitability in a long-term. They further explained that as economy is in a boom or expanding tremendously, society will become wealthier, the need for financial services which is loan will be reduced as well.

The GDP effect, on the other hand, is determined to have no correlation and is insignificantly correlated to profitability of bank, leaving the ambiguous impact of the GDP growth on profitability of bank to future study. For

instance, Muhamad Abduh and Yameen Idrees (2013) did empirical study in Malaysia. According to Sheefeni (2015), there is insufficient evidence to conclude that GDP growth has influence on the Mamibia banks' performance. There is an insignificant and no relationship between GDP and ROA, it represents that GDP will influence banks' profitability in an insignificant way (Ongore & Kusa, 2013). According to Ahmad AL-Harbi (2019), the study also revealed that GDP, has no impact on banks' profitability. According to Bajaj and Anshu (2020), the particular reason for circumstances of such insignificant relationship is due to the customers; each customer has their own strategy for increasing profits as some will invest, save more money or spending more on goods and services rather than taking loan. Additionally, the researchers were lack of information about economic changes. These are the reasons why the relationship has become negative and insignificant. The previous authors were not focusing on COVID-19 effect on their study, however based on this research, it serves as benchmark in determining the profitability of bank.

To sum up everything that has been stated so far, this study expects a positively correlation of GDP and profitability of bank, because the results from previous studies were inconsistent.

2.2.3 Capital Adequacy (CA)

Capital adequacy serves as an effective indicator on measuring banks' financial health and performance. It acts as a tool to compute the capability of bank's capital in meeting the credit risks to maintain soundness of the financial system. According to Okoye et al. (2017), banks' capital is relatively crucial because it acts as an assistance for the bank in their daily functioning by allowing a buffer for the bank to assimilate any accidental losses incurred. Since there will have many obstacles that banks faced during the crisis, thus capital adequacy could help in solving the obstacles by increasing loans and borrowings to prolong its sustainability and

soundness and safety of the financial system are maintained. Theoretically, CAR is denominated in percentage form to measure banks' financial ability which indicates its risk-weighted assets (Amahalu et al., 2016). Legal requirements are set by the Central Bank which required portion of banks' capital should be serve as reserves with the purpose to assimilate losses on bank loans or high-risk investment and avoid bank insolvency (Pradhan & Shrestha, 2017). Furthermore, a higher CAR will generally reduce the level of bank in financing externally, which indicates stable bank financial performance. When a bank has excessed in capital, it reduces the cost incurred for capitalizing. Thus, the possibility for the bank to go bankrupt will be generally decreased (Lee et al., 2019). In short, based on previous authors, the results have proven banks that hold sufficient capital during COVID-19 pandemic will perform better in terms of ROA as compared to banks with insufficient capital in hand. Similarly, the perspective of this studies is expected to be the same with the previous research.

Besides, in recent years, there are several studies investigated on capital adequacy and banks' profitability in terms of ROA. Hence, these studies possessed positive and negative results between both variables. According to Garel and Perit-Romec (2017), banks' capital adequacy is positively affecting the banking financial performance. Throughout the studies, sufficient banks' capital could increase the capability of bank to sustain during the financial crisis regardless its bank size. If there is a surplus in banks' capital account, it provides a safeguard for the possibility of bank failure (Valencia, 2016). Furthermore, during the financial crisis, sufficient banks' capital would enable them to have more borrowings at lower interest rate which leads to increase in banks profitability and financial stability even economy is going down (Cohen & Scatigna, 2016; Robin et al., 2018). According to Yolanda (2017), capital adequacy is positively affecting ROA of Islamic Bank because huge capital is required to survive in the industry so that the bank could satisfy the minimum legal requirements of capital reserve which imposed by the legal financing institutions and to compete with the international banks. According to Agu and Nwankwo (2019), banks

could obtain additional amount of loans and advances and increase the owner's equity when they hold sufficient capital. Moreover, direct effect of both variables has been investigated and further examined in order for a bank to compete in the global banking industry. They need a huge amount of capital so that they have the ability to undergo additional uncertainties when dealing with the international trading activities (Kipruto et al., 2017). In some studies, banks are advised to improve their administrative evaluation and regular assessment on its minimum capital requirement and market discipline so that they have an ability to analyze the cheapest way to obtain more fund and will result in higher income earned (Agbeja et al., 2015; Abdul, 2017; Olatayo et al., 2019). Therefore, Islamic Banks can gain public confidence by providing a safe platform for clients to invest and deposit fund. In short, previous authors emphasized that a highly-capitalize bank tends to generate high ROA since they are proven to have less demand on external financing. Similarly, during COVID-19 pandemic, after the bank moratorium was introduced, it raised the importance of Islamic Banks in fulfilling the capital reserve requirements so that they could maintain its profitability level and prevent banks insolvency issue to arise.

On the other hand, there are also some articles imposing negative relationship on capital adequacy and ROA. According to Halmawati (2019), the articles debated that if banks own a large amount of risk-weighted assets, more capital are required to hold as reserves thus banks may suffer from lower profitability. Moreover, to fulfil the minimum reserves requirement, Islamic Banks will readjust its assets portion by considering secured investment which will offer lower return, and this will create a declination in Islamic Banks' ROA. In other words, capital requirements had limited Islamic Bank in its financing activities. This is proven by the results in previous studies which claimed that when banks are unable to fulfill the reserves requirement, they tend to consider risk-free investment so that small amount of capital is required to be hold as reserves (Ayub & Javeed, 2016). Furthermore, excessive capital in hand will generally decrease the banks' opportunity to engage in better investment portfolio, and thus it

affects ROA of the bank (Nur Amirah et al., 2018). This is because when there is too much cash in hand, it will impose a self-satisfaction on the management team which will generally raise the risk of business value deteriorating. According to the previous studies, some authors found that during COVID-19, the capital reserve requirements may become a financial burden for Islamic Bank as more capital will be needed to fund the loans and borrowings which caused the bank's profitability to decline. In short, high capital adequacy is negatively affecting ROA in which creating a contrast from the perspective of this studies.

In conclusion, the results of previous study were inconsistent. Therefore, it motivated this research in examined the relationship between capital adequacy and banks' profitability during COVID-19 period with expected positive sign.

2.2.4 Moratorium (MORA)

COVID-19's spread represents an unanticipated global economic shock, with both the virus and mitigation attempts such as social distancing measures and partial and nationwide lockdowns, both having a significant economic impact on the banking sector's environment in Malaysia. According to Irda Syahira et al. (2020), SMEs as one of major clients to Islamic Bank in Malaysia were badly impacted by the COVID-19 epidemic and unable to sustain until they were forced to file for bankruptcy as a resort. Thus, to curb against the consequences of pandemic in terms of borrowers' repayment ability and to ease their cash flows, BNM has announced a six-month moratorium which is applicable to all bank loans other than credit card balances by allowing borrowers for not making repayment of loans legally for a period of time (Azril Annuar, 2020; Hayes, 2020).

According to studies of Drabancz et al. (2021), moratorium had negatively impacted Hungary banks' profitability. It impacted Hungary banks' short-

term profitability as moratorium had expanded loan repayment period. As a result, it declined Hungary banks' loan present value due to the accounting standard (Drabancz et al., 2021). This is because Hungary financial sectors adopted International Financial Reporting Standards (IFRS) which required banks record the value of loans according to present value (Rako, 2020). However, moratorium has caused Hungary banks to modify existing loan agreement with their clients who request moratorium instrument by extended the loan repayment duration. Thus, due to longer repayment period, it reduces the present value since duration period is being categorized as denominator for present value formula, and so Hungary Bank suffered a loss approximately HUF 40 billion. Further, expansion of moratorium within Hungary impacts banks' long-term profitability as it strengthens clients' default risk by unwilling to repay loan instalments. This is because moratorium is available for a short period only and yet those interest within moratorium period will be paid in the re-amortized schedule which indicate higher monthly instalments for borrowers as they are required to pay higher interest payments while on the other hand, they suffered from longer loan repayment period. Moreover, the study of Drabancz et al. (2021) concluded that borrowers' moral hazard issue arises and yet their discipline on loan repayment is being affected by such expansion on moratorium. As a result, it enhances bank loan portfolio risks by reducing assets' quality which damage the lending ability, and so it hurts long-term profitability whereas such statement was supported by the paper of Ghosh and Saima (2021). In addition, based on the study of Muhammad Hasmi et al. (2020), bank profitability had declined while the main factor was due to moratorium. Such statement was supported by Salim and Latuperissa (2020). This is because according to the study of Salim and Latuperissa (2020), they conducted multiple regression analysis and pointed out such negative relationship was because of moratorium generated higher allowance for impairment loss. Thus, it lowered down the bank's profitability since allowance for impairment loss is an expense for banks on their expectation on future losses on loans lend out.

Furthermore, according to the paper of Mehta and Kaul (2020), moratorium has indirect negative relationship towards bank profitability in term of return of assets (ROA). Moreover, such statement was supported by studies of Lohia (2021). Under the research paper of Lohia (2021), she mentioned that indirect relationship was due to the reason moratorium enhanced Indian banking sectors' long run NPAs while such increment in term of NPAs damaged profitability. This is because she explained moratorium was in fact pose long-term credit-negative risk on banks assets as moratorium was just a short-term solution and is impossible for continuation since it will cause financial systems' instability. On the other hand, the impact of COVID-19 towards economy, unemployment and borrowers' income are long last and still ongoing. Thus, it poses downgrade on bank assets' quality in long-run which caused them unable to receive interest income from loans (Lohia, 2021). Such statement was supported by the studies of Barua and Barua (2020) and Dey and Wang (2021) as well. Furthermore, such increment of NPAs caused lesser lending activities provided by banks in the near future since higher NPAs indicate that banks are suffering lower financial resources due to uncollectable credit from those assets (Ramasamy, 2020). Thus, due to lower lending activities within the market, it will impact the economic growth which in turn damage banks' financial profitability and may indicate the occurrence of banking financial crisis in future. Besides, Srividya and Vijayalakshmi (2021) illustrated that due to increment of NPAs which caused by moratorium, it weakened Indian Banks' profitability in another way which was through higher provision of credit loss. This is because they mentioned that higher NPAs indicates that banks are required to allocate higher financial resources as subsidies against that income that unable to receive from those NPAs. Thus, as a result, it increases banks' operating expenses which enhanced their financial burden, and such result was supported by the studies of Hladika (2021) as well.

Nevertheless, based on the paper of Somasundaram (2020), he argued that moratorium and banks' profitability is having positive relationship. This is because during moratorium period, banking institutions are still able to

generate interest income from those loans who applied moratorium instruments, but the interest income will be received after the moratorium period. Furthermore, he also found that such moratorium situation enhanced banks profitability in other way. This is because his studies found that Indian Banks had utilized moratorium instruments by gaining more profit. This is because his studies indicated Indian Banks had convinced and deal with their credit card customers by converted their credit card balances to become a term loan which paid fixed monthly instalments in order to enjoy moratorium instrument. This is because moratorium instruments were only available for term loan while credit card debt was not included in such instruments. Thus, it strengthens Indian Banks' profitability due to the conversion of credit debt towards term loan. This is because credit card owners were being imposed a processing fee which also known as transaction fees during the conversion process.

However, Irda Syahira et al. (2020) investigated that moratorium and bank profitability did not have any relationship. This is because they found that moratorium was actually impact banks' liquidity and cash flow as they illustrated there were approximately 70% of Islamic Bank customers applied such moratorium. Further, Irda Syahira et al. (2020), they also explained that the impact of moratorium towards cash flow was through the alteration of financial terms and conditions on loans which causes banks suffer a one-time loss. This is because they mentioned that moratorium forced banks need to take action by discussed with customers who applied moratorium in make changes on the loan repayment period and monthly repayment amount. Additionally, they also mentioned that the impact of moratorium towards banks' liquidity was through unavailability on receiving lending amounts during moratorium period while on the other hand, banks were relying heavily on loan repayments to ensure functional daily operations.

In conclusion, due to inconstant results from previous studies, while on the other hand, this study examines impact of Malaysia domestic Islamic Banks'

financial performance before and during COVID-19 period and moratorium is one of the crucial instruments implemented by Government to curb against COVID-19 pandemic. Therefore, it motivated this research in examined the relationship between moratorium and banks' profitability during COVID-19 period by expected negative relationship.

2.2.5 Bank Liquidity (BKLQ)

Bank liquidity always acts as a crucial element in banking industry, as well as Islamic Banking. It is uncertain since they can be affected by external factors and internal factors of a banking institution. Therefore, a banking institution must manage their liquidity as a core daily process in order to monitor their cash flow well. Furthermore, Anyanwu (as cited in Amnim et al., 2021) stated that a little liquidity shortage could have a serious damage to the financial institution's operation as well as relationship with the customers. In fact, a good relationship with customers is extremely important and it acts as a competitive advantage of an Islamic Bank (Dintsis, 2020). Liquidity risk arises when a bank faces failure to fulfil the financial obligations to their depositors. It may happen because the management of bank do not properly forecast the needs of funds in the future. If liquidity risk is not being handled properly, it will affect the reputation of bank such as bad press release related to the banking institution, eventually affect the customer's relationship that has been building over years. Hence, a bank should always keep sufficient liquid assets in order to meet the demands of customer during COVID-19 and for future preparation in case of any financial crisis happen.

When a bank is having lower liquidity and lesser risk exposure, it will positively affect bank profitability (ROA) (Salim & Bilal, 2016). Based on the study of Rudhani et al. (2016), they claim that liquidity is an endogenous factor that determine the bank profitability. A negative correlation between liquidity and profitability of bank is confirmed by them (Rudhani et al.,

2016). Such relationship has been supported by Dahiyat (2016); Marozva (2015); Nimer et al. (2015); and Hasan (2017) as well. It is claimed that when a bank has a high liquidity, it reduces the opportunities of a bank to gain extra income, which leading to a lower bank profitability. However, the researchers did not focus on the impact of COVID-19 towards the bank liquidity and profitability. Therefore, this study is being conducted to determine the relationship of bank liquidity and Islamic Banks' profitability for before and during COVID-19 period.

However, according to Lucy et al. (2018); Mohammad Morshedur et al. (2015), there is a strong positive relationship between bank liquidity and their profitability. Hence, liquidity management should be handled efficiently in order for a bank to maximize their profit and concurrently remains their liquidity. Furthermore, according to Hussain et al. (2018); Abdul Hadi et al. (2018), they concluded that managing liquidity risk is associated with lower bankruptcy risk for Shariah compliance firms (such as Islamic Bank). This further showing that liquidity is having positive relationship with profitability. The positive relationship is supported by Rafiq Ahmad (2016); Ibrahim (2017); Wuave et al. (2020). In the study of Ibrahim (2017), the study found that the greater the liquidity ratio, the greater the ROA. The positive relationship of bank liquidity and profitability are being tested before COVID-19 crisis. Hence it is used as a benchmark for this research in order to measure the Malaysia domestic Islamic Banks' financial performance.

Moreover, according to Tran et al. (2016), they found out that regulatory capital and liquidity creation is positively affecting bank profitability. Therefore, if a bank is holding more liquid assets, it will help to generate more revenue since the liquidity can reduce the default risk no matter in low or high capitalized banks. Besides, Khasharmeh (2018) claimed that liquidity strongly affects profitability of Islamic Bank. However, there is no need to store for excess liquidity, instead, an Islamic Bank can manage the funds by investing in order to increase their profitability. According to Tram

et al. (2021), they have done a study on 171 banks among 9 countries within Southeast Asia from 2004 to 2016 and have successfully examined a positive effect of liquidity on banks' profitability during the normal situation. However, liquidity risk can affect bank financial performance negatively during a financial crisis. During the crisis, banks aim to improve their profitability by increasing their liquid assets, it is resulting in high financial cost and reduce bank efficiency eventually. It results that a financial institution should properly manage its liquidity balance in order to avoid for any addition cost occurred. Especially during COVID-19 crisis, less expenses should be made in order to increase the profitability of a bank.

Therefore, since there are inconsistent results provided by different studies, this study is examining the relationship between bank liquidity and profitability of Islamic Banks with the predicted positive sign.

2.3 Conceptual Framework

In section 2.3, it provides a conceptual foundation for the researchers to study the correlation among the exogenous and endogenous variables which consists of GDP, CA, MORA, BKLQ, and ROA respectively.

Independent variables (before COVID-19 period)

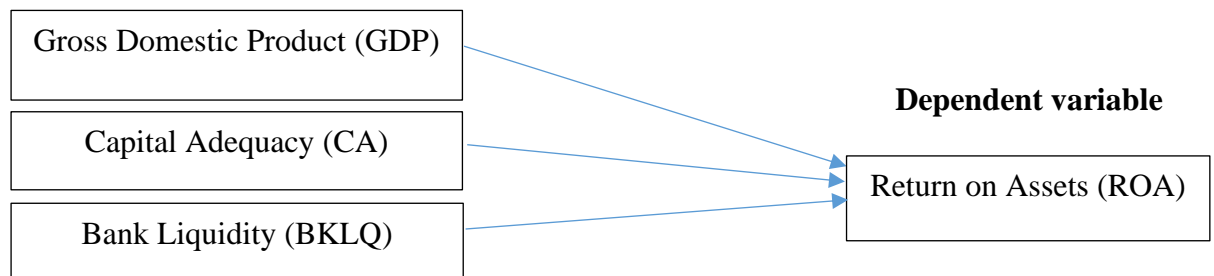


Figure 2.1. Impacts of the exogenous variables on Islamic Bank's financial performance before COVID-19 period. Sources: Gautam (2018); Nur Amirah et al. (2018); Shireen Mahmood (2019)

Independent variables (during COVID-19 period)

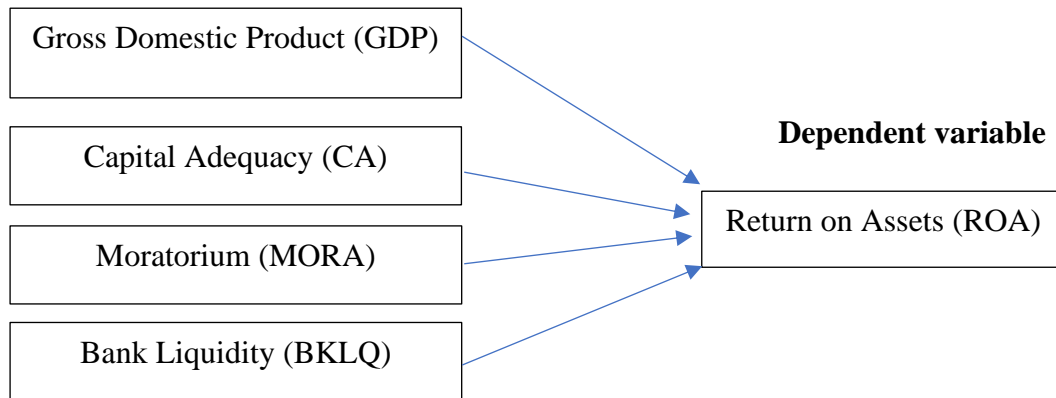


Figure 2.2. Impacts of the exogenous variables on Islamic Bank's financial performance during COVID-19 period. Sources: Jeris (2021); Mansour et al. (2021); Lohia (2021); Rahmi and Sumirat (2021)

2.3.1 Gross Domestic Product (GDP)

Gross domestic product (GDP) is used to measure the health of the economic activities and output generated in a particular country. Numerous researchers investigate the relationship between GDP and bank profitability. When economy growth rate increases, it is expected to affect the banks' profitability positively. Based on Olokoyo et al. (2019), GDP growth is positively affected bank performance after adopted Nigeria data. It explained by when a country's trade and productive capacity increases, real incomes rise, and banks will become more confident in lending to clients and other banking operations. As output increases, incomes rise and demand for products and services will rise. This positive relationship has proven by the study of Yuksel et al. (2018), they discovered that during bad economic condition in post-Soviet country, individuals are in a bad condition as a lot of people without job, income and asset. However, they are allowed to take the loan so eventually these individuals will face difficulty in repaying the loan which reduces the bank's lending operations and brings the bank less profit. According to Gautam (2018), a positive relationship is found as a higher GDP is considered as an indication of increase in purchasing power

and the ability of investors increase to invest in stocks leading to increase of ROA. According to Gikombo and Doris (2018), a positive and substantial association exists between high economic growth in Kenya and causing a better credit quality, which able boosts profitability of banks. Therefore, GDP is adopted as a macroeconomic indicator to examine how banks' profitability moves according to economic growth in Malaysia before and during COVID-19 period.

2.3.2 Capital Adequacy (CA)

According to most of the previous articles, the result showed that capital adequacy is positively affecting the ROA of Islamic Bank. According to Lee et al. (2019), capital adequacy allows banks to safeguard against the uncertainties faced in their day-to-day operation because banks will not always in the gaining position and yet the bank may incur losses in terms of the investment that they involved. Moreover, according to Kipruto et al. (2017) as well as Kamande et al. (2016), sufficient banks' capital allows banks to be more competitive in the global market as huge capital is required for the banks to undergo additional risks in corresponding with the international trading activities. However, based on the Buffer Theory, it expects that capital adequacy is positively affecting ROA because sufficient capital enhances banks' ability in meeting legal minimum capital requirements so that it reduced the uncertainty risk that bank may face during pandemic period while ROA will be increased gradually. (Udom & Onyekachi, 2018) In addition, capital adequacy is crucial because it assists in maintaining the soundness of the financial system. (Olatayo et al., 2019). So, capital adequacy is a vital factor that affecting ROA. In short, capital that banks hold serves a variety of functions before and during COVID-19 especially after the bank moratorium has been implemented. There is a declination in the financial performance of Islamic Banks during COVID-19 as compared to period before COVID-19.

2.3.3 Moratorium (MORA)

Moratorium provides borrowers the right by not to make repayments on loan for a period and it is commonly implemented during crisis period (Hayes, 2020). It is crucial in evaluating how moratorium is related to banks' profitability. This is because the objectives of this study are to compare Islamic Banks' financial performance before and during COVID-19 period while various studies have proven that moratorium was implemented and served as an effective tool in curbing against financial impact of COVID-19 pandemic. Moreover, research paper of Amir Shaharuddin (2020), Drabancz et al. (2021), Dey and Wang (2021), Kumar (2020), and Lohia (2021) concluded inverse correlation among moratorium and banks' financial performance where it able to explain from NPAs, modification, present value, provision expenses and interest income perspective. By adapting the study of Amir Shaharuddin (2020), they concluded inverse relationship was due to Malaysia Islamic Banks are required to bear the modification loss in moratorium by prohibiting in passing the cost towards customers due to government intervention and argument in term of Islamic Banks' objectives which is to solve the social hardship.

2.3.4 Bank Liquidity (BKLQ)

According to the study Faisal Abbas et al. (2019), they stated that there is a positive impact of liquidity in the Asian developed economics in the post crisis period. The availability of liquid assets leads to an increasing of profitability in Asian bank. Furthermore, according to Ismail (2016), he concluded that there is a positively correlated relationship of bank liquidity management to the profitability of bank. According to Rudhani and Balaj (2019), they have concluded there is positive correlation among bank liquidity and profitability. They claimed that bank can improve its financial performance by enhancing its ability to face liquidity. Besides, Golubeva et

al. (2019) found some evidence that an increased liquidity can help to improve the profitability of a bank. Also, according to Charmler et al. (2018), bank liquidity is having a strong positive relationship with ROA. It shows that if a bank holds sufficient liquid assets, it will have an improved profitability compared to other banks who do not hold reasonable liquid assets. High liquidity allows a bank to be more resilient towards any unforeseen shocks and will be able to remain profitable. Therefore, managing bank liquidity is a crucial factor in affecting the profitability of banks. In short, if a bank is having high liquidity, it will have more ability to bear with the risk and pressure when any crisis occurs.

2.4 Hypothesis Development

In section 2.4, it explains the hypothesis of the relationship among the endogenous and exogenous variables which consists of GDP, CA, MORA, BKLQ, and ROA respectively. Furthermore, the established hypothesizes are supported by the past literatures.

2.4.1 Gross Domestic Product (GDP)

GDP is a metric that is used to evaluate the condition of a nation's economic activities and output. Numerous researchers investigate the relationship between GDP and bank profitability. According to Yuksel et al. (2018), they discovered that during bad economic condition in post-Soviet country, individuals are in a bad condition as a lot of people without job, income and asset. However, they are allowed to take the loan so eventually these individuals will face difficulty in repaying the loan which reduces the bank's lending operations and brings the bank less profit. According to Mendoza and Yue (2008), they explain the reason of why the lower the GDP, the higher the bank's profits. The risk of default is higher in downturn, and so bad debt will be higher which lead to lower profitability of bank. According

to Gautam (2018), a positive relationship is found as a higher GDP is considered as an indication of increase in purchasing power and the ability of investors increase to invest in stocks leading to increase of ROA. Furthermore, strong economic development would increase domestic borrowers' debt servicing capacity, lowering the risk of default for banks because they will be able to effectively recover debt and extend new ones. Therefore, hypothesis formed between GDP and Islamic Banks' profitability are as follow:

H_0 : Gross Domestic Product (GDP) has no significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

H_1 : Gross Domestic Product (GDP) has significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

2.4.2 Capital Adequacy (CA)

CA acts as an important variable in explaining Islamic Banks' profitability. Thus, according to Halmawati (2019), the results shows that when banks' capital increases, the banks' profitability decreases gradually because highly-capitalize banks own more in risk-weighted assets which lead Islamic Bank to have lower profit. Moreover, a negative effect had been found on banks' capital adequacy on ROA when there is a reapportionment on Islamic Banks' assets possessions towards its low-risk investment such as bond (sukuk) as Islamic Banks are required to follow the minimum capital reserves requirement set by the Basel Accord and the requirement had limit the bank in its financing activities which results in a stagnation in country's economic recovery (Ayub & Javeed, 2016). On the other hand, according to Muhammad Hussain and Abbas (2019), significant relationship has been found which illustrated that when banks own sufficient capital, it will enable them to gain high public confidence and reduce its

financial burden when crisis hits. Moreover, banks financial flexibility could be strengthened and maintained when they have higher CAR. Specifically, research investigated that during COVID-19 pandemic, when banks' holds higher amount in its aggregate legislative capital as compared to risk-weighted assets, thus it safeguards the Islamic Bank from any massive losses and allow Islamic Bank to remain its financial stability (Mansour et al., 2021). Therefore, hypothesis is formed between capital adequacy and Islamic Banks' profitability are as follow:

H_0 : Capital adequacy (CA) has no significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

H_1 : Capital adequacy (CA) has significant relationship to the ROA of Islamic Bank in Malaysia before and during COVID-19 period.

2.4.3 Moratorium (MORA)

MORA is one of the instruments that being implemented by government in order to curb against financial crisis. This main objective of this instrument is to ensure markets are able to survive within difficulty situation by permitting borrowers for not to repay their debt obligations for a temporary period which depends on the government decision. Besides, there were a few researchers conducted studies towards the relationship between moratorium and banks' profitability. This is because banks are the players that being impacted the most by this instrument while on the other hand, they are the most significant parts of the economy and financial system. Thus, it gained the previous researchers' attention on identify their relationship. According to the studies of Salim and Latuperissa (2020), they found that moratorium is significantly negatively impact banks' profitability directly or indirectly. Firstly, they mentioned that direct relationship was because of higher amount of moratorium leads to lower interest income which is the major income sources from banks perspective. Moreover,

indirect significant negative relationship occurred as moratorium had increased the provision for credit losses which lead to higher operating costs suffered by banks and so it hit hard banks' earnings. Additionally, it in turn reduced lending activities due to financial constraints which caused by lowering interest income and so it further reduced banks' profitability (Lohia, 2021). Therefore, hypothesis formed between moratorium and Islamic Banks' profitability are as follow:

H₀: Moratorium (MORA) has no significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

H₁: Moratorium (MORA) has significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

2.4.4 Bank Liquidity (BKLQ)

BKLQ is a measure of ability for a bank to settle its short-term business or financial obligations, without occurring unexpected losses (Duttweiler, 2009). According to Rudhani et al. (2016), an effective liquidity management helps a bank to satisfy customers' needs even though financial difficulties is suffered by the bank. However, ineffective liquidity management will lead to serious outcomes. This is backed up by the study of Khasharmeh (2018), it is concluded that bank liquidity strongly affecting the profitability of Islamic Bank. Moreover, it is important to know that high liquidity in Islamic Bank brings pros and cons. There is no need to keep excess liquidity, sufficient amount should be invested to increase bank profitability and whenever to meet the customers demand for cash (Suresh & Bardastani, 2016). So, Islamic Bank will be unable to reach their targeted profit if they are failed to maintain proper liquidity. Moreover, in a study of Almonifi et al. (2021), they investigated the bank performance of Islamic Bank in Kingdom of Saudi Arabia (KSA) before and during the pandemic. They stated that impact of COVID-19 towards financial performance of

Islamic Banks is very low. It is suggested that the Islamic Bank suffered low in its profitability and liquidity, there is an increase in customer deposits since the customers trust in Islamic Banks during crises. Therefore, hypothesis formed between bank liquidity and Islamic Bank's profitability are as follow:

H₀: Bank liquidity (BKLQ) has no significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

H₁: Bank liquidity (BKLQ) has significant relationship to the ROA of domestic Islamic Bank in Malaysia before and during COVID-19 period.

2.5 Conclusion

In a nutshell, such chapter consists of literature review on the GDP, CA, MORA, BKLQ, and ROA for this study based on the previous related studies. Besides, theoretical model has been discussed and supported for each of the variable as well. Furthermore, conceptual framework and hypothesis development have been demonstrated as well after reviewing previous research papers. Last but not least, the next chapter is about methodology that will be applied in this study.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter outlines the research methods used in this study for identifying, picking, processing, and interpreting data. Research design in which secondary data is used in this research is explained in Section 3.1. Then, Section 3.2 explains the sampling techniques which are purposive data, and 11 out of 16 Islamic Bank in Malaysia are chosen in this study. In Section 3.3, it includes the sources of the data obtained from and the reliability of the data. Further, Section 3.4 illustrate econometric framework that is suitable for this study which is panel data regression model. Last but not least, Section 3.5 will construct proposed data analysis tool on the descriptive analysis, diagnostic checking and inferential analysis with econometric framework.

3.1 Research Design

The goal of the study is to examine the correlations between banking-related variables and profitability in terms of Return on Assets (ROA) of Islamic Banks in Malaysia before and during COVID-19 pandemic. To examine the Islamic Banks' profitability, ROA is being adopted as dependent variable and the banking related independent variables included in this study are Gross Domestic Product (GDP), capital adequacy (CA), moratorium (MORA), and bank liquidity (BKLQ).

Research design refers to a structure that acquires methods to connect the component of the research methods together efficiently. Thus, the plan of research design is required to be done before data is being gathered from diverse sources. In fact, research design can be completed in 3 different forms which are qualitative, quantitative and mixed methods. Thus, quantitative method is being used in this study rather than qualitative method as it is more reliable. Quantitative method focused on objective quantification and the arithmetic, algebraic or numerical study

of figures gathered via questionnaires, survey, and forms, or apply algorithmic method to process advanced numerical data. In this research, secondary data is being adopted and quarterly data from 2019 which is period before the COVID-19 outbreak until 2020 which is period during the COVID-19 outbreak is collected. Thus, data used in this study is being collected from BNM and selected Islamic Banks' quarterly financial reports.

Specifically, this study is focusing on 11 different domestic Islamic Banks in Malaysia and panel data is going to be adopted as there will be a total of 88 observations since it is collected from 11 Islamic Banks' data on quarterly basis from January 2019 which is period before the COVID-19 pandemic until December 2020 which is the period during COVID-19 pandemic. Thus, this study is expected to obtain a dependable yet compatible outcomes.

3.2 Sampling Design

This section mainly includes 4 subsections which are target population, sampling frame, sampling technique, and sample size of research. The target population explained about the population of Malaysia Islamic Bank and their total assets. Besides, sampling frame mentioned about the sample adopted within the target population which is relevant and suitable for this research. Moreover, sampling technique illustrate types of technique being implemented in this study in order to obtain sample frame. Lastly, sample of size of this research will be mentioned in this section as well.

3.2.1 Target Population

In this study, the targeted population is set to be the Malaysia's Islamic Banking industry as Malaysia Islamic Banks are getting more important because they are occupying high market capital at nearly 40% in the Malaysia banking industry. In the whole Malaysia's Islamic Banking

industry, there are 16 Islamic Banks in total which including 11 domestic Islamic Banks and all these 11 domestic Islamic Banks are set to be the target population in this study which have shown in table 3.1.

Table 3.1:

List of Domestic Islamic Banks in Malaysia

No.	Domestic Islamic Banks
1	Affin Islamic Bank Berhad
2	Alliance Islamic Bank Berhad
3	AmBank Islamic Berhad
4	Bank Islam Malaysia Berhad
5	Bank Muamalat Malaysia Berhad
6	CIMB Islamic Bank Berhad
7	Hong Leong Islamic Bank Berhad
8	Maybank Islamic Berhad
9	MBSB Bank Berhad
10	Public Islamic Bank Berhad
11	RHB Islamic Bank Berhad

Sources: (BNM, 2021)

3.2.2 Sampling Frame

In this research, 11 domestic Islamic Banks in Malaysia is being focused which has shown in table 3.1. Since domestic Islamic Banks own higher market capital when comparing to foreign Islamic Banks, so the domestic Islamic Banks have to be taken heed.

3.2.3 Purposive sampling

Purposive sampling is a type of non-probability sampling method. It is also known as the judgement sampling which relies on the selection or subjection of researchers for determining the sample size in their study. Researchers intentionally select an informant based on the qualities the informant possess and the satisfaction level to the needs or interests of the researchers. Purposive sampling can be applied in both qualitative and quantitative research methodologies. This sampling technique offers the advantages of being time and cost-effective as it allows the researchers to save much effort and time in seeking target informant. Purposive sampling is selected to be the sampling technique in this study due to the benefits offered as well as it suits with the research method of this study. Also, this study specifically selects and focuses on all the Malaysia's 11 domestic Islamic Banks. Since the target population of this study is difficult-to-reach to be measured, so this technique is the most appropriate sampling technique in this study because it allows to extract a lot of information from acquired data.

3.2.4 Sample Size

To calculate the sampling size for panel data, the number of banks have to be multiplied by the number of periods utilized for the observation. In employing the panel data for this research, a sample size of 50 or more is recommended in order to get a better significant test effect and more precise results (Santos & Barrios, 2011). Since the data is collected quarterly within the year of 2019 up to 2020 for 11 banks, the total number of the sample size is 88 which $N=11$ multiplied by $T=8$.

3.3 Data Collection Method

In this research, panel data is being used and applied to investigate the relationship of banking related independent variables on ROA on selected domestic Islamic Bank in Malaysia by applying secondary data. Panel data is the amalgamation of cross-sectional data and time series data. Therefore, panel data is chosen because it could identify and estimate statistical result by which other data could not estimates. Moreover, panel data can explain detail information, flexibility and relatively effective than time series data and cross-sectional data. Specifically, secondary data defines as the data that had been gathered or created by previous authors in previous research or in organizations' official website. Thus, secondary data is chosen in this study instead of primary data is because it is considered as a time-saving method for the researcher and data collected are accurate and openly obtainable, thus secondary data is effective and efficient to be adopted in this study.

Furthermore, secondary data of ROA and 4 banking related explanatory variable consists of GDP, CA, MORA and BKLQ are assembled from numerous references that shown in Table 3.2. Secondary data used in this research is extracted from a quarterly financial report from the period of year 2019 until 2021 on 11 different domestic Islamic Banks in Malaysia. All the explanatory variables are computable in this study; thus, formulas of financial ratios are applicable in computing each variable in the study. The financial ratios used are according to figures from the banks' profit and loss statement, statement of financial position, statement of cash flows and additional notes stated in the quarterly financial statements. Next, when the financial ratios of each variable are computed, the data will be then transmitted to Microsoft Office Excel and bring into EViews 12 software for the data investigation. To ensure the accuracy of the data in this studies, recent data is collected by referring to original source of data which is from BNM and Islamic Bank quarterly financial statements.

Table 3.2:

Variables and Sources of Data

Variables	Notation	Unit of measurement	Data sources	Year of publication
Return on Assets	ROA	Percentage (%)	Islamic Bank Quarterly Financial Statements.	2019-2021
Gross Domestic Product	GDP	Percentage (%)	Bank Negara Malaysia	2019-2021
Capital Adequacy	CA	Percentage (%)	Islamic Bank Quarterly Financial Statements.	2019-2021
Moratorium	MORA	Malaysia Ringgit (RM)	Islamic Bank Quarterly Financial Statements.	2020-2021
Bank Liquidity	BKLQ	Percentage (%)	Islamic Bank Quarterly Financial Statements.	2019-2021

Sources: Developed for this research

3.4 Econometric Framework

Econometric model is being proposed in this study in order to determine the significance of ROA with 4 independent variables included GDP, CA, MORA and BKLQ. Under this econometric mode, MORA will be added log function for easier and standardized understanding and interpretation.

3.4.1 Panel Data Regression Model

In this research, panel data regression model is used to test impact of Malaysia domestic Islamic Banks' financial performance before and during COVID-19 period with ROA and 4 explanatory variables consist of GDP, CA, MORA and BKLQ quarterly from 2019 (Before COVID-19 period) to 2020 (During COVID-19 period).

(Before COVID-19 period)

$$ROA_{it} = \beta_0 + \beta_1(GDP)_{it} + \beta_2(CA)_{it} + \beta_3(BKLQ)_{it} + \varepsilon_{it} \quad (3.1)$$

(During COVID-19 period)

$$ROA_{it} = \beta_0 + \beta_1(GDP)_{it} + \beta_2(CA)_{it} - \beta_3 \ln(MORA)_{it} + \beta_4(BKLQ)_{it} + \varepsilon_{it} \quad (3.2)$$

Where,

ROA = Return on Assets (in percentage)

GDP = Gross Domestic Product (in percentage)

CA = Capital Adequacy (in percentage)

Ln (MORA) = Logarithm of Moratorium Malaysia

BKLQ = Bank Liquidity (in percentage)

ε = Error term

i = 11 Malaysia Domestic Islamic Banks (Affin Islamic, Alliance Islamic, AmBank Islamic, Bank Islam Malaysia, Bank Muamalat, CIMB Islamic, Hong Leong Islamic, Maybank Islamic, MBSB Bank, Public Islamic, RHB Islamic)

t = Quarterly period (January 2019 to December 2019) (Before COVID-19); Quarterly period (January 2020 to December 2020) (During COVID-19)

Table 3.3:

Symbol and Measurement

Symbol	Definition	Unit measurement	Previous studies
ROA	Return on Assets	Net Income / Total Assets (in percentage)	(Supriyadi, 2021)
GDP	Gross Domestic Product	GDP growth rate (in percentage)	
CA	Capital Adequacy	(Tier 1 Capital + Tier 2 Capital) / Risk	(Mansour et al., 2021)

		Weighted Assets (in percentage)	
Ln (MORA)	Logarithm of Moratorium Malaysia	Ln (Moratorium Malaysia)	
BKLQ	Bank Liquidity	Total Financing / Total Assets (in percentage)	(Kadir et al., 2011)
ε	Error term	-	
i	11 Malaysia Domestic Islamic Banks (Affin Islamic, Alliance Islamic, AmBank Islamic, Bank Islam Malaysia, Bank Muamalat, CIMB Islamic, Hong Leong Islamic, Maybank Islamic, MBSB Bank, Public Islamic, RHB Islamic)	-	

t	Quarterly period (January 2019 to December 2019) (Before COVID-19)	-
	Quarterly period (January 2020 to December 2020) (During COVID-19)	

Sources: Developed for this research

3.5 Proposed Data Analysis Tool

This section includes descriptive analysis which is crucial before conducting inferential analysis since it provides the foundation to it. Besides, this section includes necessary diagnostic checking for this study which are normality test, multicollinearity test, heteroscedasticity test and autocorrelation test. Further, this section comprises of inferential analysis as well which involve Fixed Effects Model (FEM), Random Effects Model (REM), Pooled Ordinary Least Square Model (Pooled OLS), Poolability Hypothesis Testing, Hausman Test, and Breusch and Pagan Lagrange Multiplier Test.

3.5.1 Descriptive Analysis

Before inferential analysis, descriptive analysis has to be constructed since it anticipates the fundamental towards inferential analysis. This is because descriptive statistics is providing an information summary which collected from data set in this study for endogenous variable and explanatory variables by assisting researchers to identify the center value among the data set and how far the data set appear to be from the mean. Further, the

regressand in this study is ROA while the explanatory variables include GDP, CA, MORA and BKLQ.

Additionally, descriptive statistics can be decomposed into 2 main categories which included measures of center, and measures of spread. Besides, under measures of center, it can be further decomposed into mean, mode and median. Mean values indicate every single variable's average value which can be computing by 44 observations for before and during COVID-19 period. Mode indicates the values that most often occur in each variable before and during COVID-19 period while median refers to the middle score in an ordered distribution for each variable. Furthermore, under measures of spread, this study adopted variance and standard deviation as it measures how far the data set appear to be from the mean value.

3.5.2 Diagnostic Checking

This subsection includes normality test which can be measure and test by Jarque-Bera test. Besides, this subsection involves multicollinearity test which can be detect by various indicators such as high R^2 with few significant t ratios, tolerance (TOL), pairwise correlation and Variance inflation factor (VIF). Moreover, heteroscedasticity test will be explained under this subsection which can be measure by Breusch-Pagan Lagrange Multiplier test for this study while autocorrelation test includes in this subsection as well that can be test through Durbin Watson d Test.

3.5.2.1 Normality Test

With the intention to ascertain whether did the error term fulfilled the normality assumption, Jarque-Bera (JB) test is applicable to measure and examine the error term. The JB test of normality is considered as an

asymptotic, or a test examining on large-sample data according to the Ordinary Least Squared (OLS) residuals. Theoretically, JB test measures on the skewness which is examining on the symmetry and kurtosis which is computing on the level of the normal distribution followed by computing on the error term of OLS. There are two methods of hypothesis testing with is the test statistic approach and the p-value approach. Specifically, formula used in the test statistic approach of JB test is shown below:

$$JB = n \left[\frac{S^2}{6} + \frac{(K - 3)^2}{24} \right] \quad (3.3)$$

where s = skewness and k = kurtosis

Similarly, both approaches begin with the same hypothesis which is shown as below:

H_0 : The error terms are normally distributed.

H_1 : The error terms are not normally distributed.

Thus, in test statistic approach, the critical value is determined from the Chi-Square table by which the degree of freedom is fixed as 2, $\chi^2(\alpha, df=2)$. If p-value is smaller than alpha, then H_0 should be rejected.

Besides, p-value approach is another way to test the normality assumption on the error term. Thus, when p-value is smaller than significance level at 5%, then H_0 should be rejected. In conclusion, if the outcomes shown the alpha smaller than p-value therefore error term is normally distributed.

3.5.2.2 Multicollinearity

Explanatory variables used in this study are highly correlated to one another in the econometric model and caused problem of multicollinearity. High correlation will hinder the independent variables in showing its effect and relationship on the dependent variable. Thus, multicollinearity problem will cause the statistical inference to be not dependable and inaccurate. However, when the independent variables are highly correlated, the OLS estimator will remain its unbiasedness as the collinearity will not demolished the minimum variance, so the estimators remain efficient, compatible and precisely predicted standard error. The issues that multicollinearity give rise to is the R^2 of the independent variables will be equaled to 1 as the variances and covariance of the parameters increases. Thus, parameters with large variance indicates that its standard errors are relatively high, thus the test statistic value will be smaller and larger confidence interval obtained and there will be a rising possibility of not declining a wrong hypothesis.

So, there are 3 methods in detecting the multicollinearity problem which is when high R^2 is obtained associating with some significant t ratios which means that significancy detected on general statistics outcome, but insignificancy found on individual statistic outcomes. Next, multicollinearity could be detected on highly pair-wise correlation among the parameters. This indicates that when the correlation of the independent variables is higher than 0.80, thus high correlation among the variables is found. The third method to detect the multicollinearity problems is by computing the VIF and TOL by using the formula shown as below:

$$VIF = \frac{1}{(1 - R_{X_1X_2}^2)} \quad TOL_j = \frac{1}{VIF_j} = (1 - r_{X_2X_3}^2)$$

(3.4)

Thus, if the VIF and TOL is equal to 1, which means there will be no multicollinearity problem detected. In contrast, when VIF is higher than 10 or TOL falls near to 0, high collinearity problem obtained in the model.

Table 3.4:

Rule of Thumb of VIF

VIF value	Interpretation
VIF = 1	No multicollinearity found.
$1 < \text{VIF} < 10$	No serious multicollinearity found.
VIF = ∞	Perfect multicollinearity found.
VIF > 10	Serious multicollinearity found.

Table 3.5:

Rule of Thumb of TOL

TOL value	Interpretation
TOL = 1	No multicollinearity found.
TOL close to 0	Serious multicollinearity found.
TOL close to 1	No serious multicollinearity found.

3.5.2.3 Heteroscedasticity

Occurrence of heteroscedasticity when the error term variance changes accordingly to the values of explanatory variables. Heteroscedasticity problem shows that the variance is not consistent, and it is caused by the outliers present in the data. It often occurs in a dataset which has a wide range in between the largest or smallest variables with respect to the other variables in the dataset. Heteroscedasticity can substantially affect the results of regression model in this study, especially when the sample size is small. Furthermore, heteroscedasticity may cause by the careless mistake such as omission of some important variables in the dataset.

Even though heteroscedasticity does not affect the unbiasedness, it affects the variance of estimators is no longer minimum and it is inefficient and may not be accurately measured eventually. Lower efficiency and accuracy caused the value of coefficient move further away from the right population value. Therefore, risk is found to make the statistical findings to be unreliable and the conclusion made might be misleading. It is important to avoid heteroscedasticity in order to the Best Linear Unbiased Estimators (BLUE).

Breusch-Pagan Lagrange Multiplier test is applied in this study to detect for any heteroscedasticity found in linear regression models.

The estimated linear regression model:

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_k X_{ki} + \mu_i \quad (3.5)$$

Followed by auxiliary model:

$$\hat{\mu}_i^2 = \alpha_1 + \alpha_2 X_{2i} + \alpha_3 X_{3i} + \dots + \alpha_k X_{ki} + \varepsilon_i \quad (3.6)$$

$\hat{\mu}_i^2$ = residual obtained from the regression model.

The hypothesis is as following:

$H_0: \alpha_2 = \alpha_3 = \alpha_4 = \dots = \alpha_6 = 0$ (There is no heteroscedasticity.)

H_1 : At least one α is different from zero. (There is heteroscedasticity.)

If BP test's p-value is less than alpha, H_0 is rejected. Hence, the error term is significant to the regressor and there is heteroscedasticity.

3.5.2.4 Autocorrelation

When error terms are correlated, it will lead to occurrence of autocorrelation, which means they are dependent with each other in a period of separate year. Autocorrelation is crucial since it brings some consequences to the OLS estimators. If autocorrelation obtained in a linear regression model, it causes it to be inefficient and it is no longer BLUE. Therefore, knowledge of presence of autocorrelation is important because it helps to lead the researcher to obtain more appropriate and accurate statistical analysis.

In this study, Durbin Watson d Test was used based on the estimated residual in the regression analysis. In this test, except for 'acceptance' and 'rejection', the test also has a possibility of obtaining 'the inconclusive' region. If d is smaller than dL, and d is larger than $(4 - dL)$, there is a serial correlation. On the other hand, if d is in between dU and $(4 - dU)$, there is no serial correlation. Otherwise, the results are considered as inconclusive.

The hypothesis is as below:

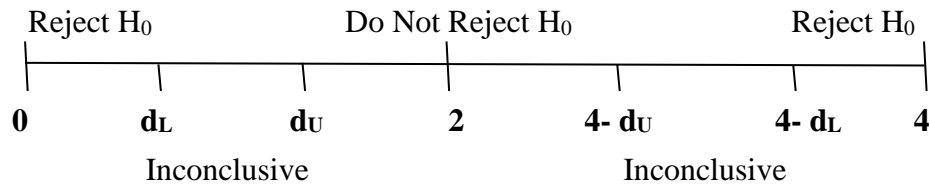
$H_0: \rho = 0$ (There is no serial correlation.)

$H_1 : \rho \neq 0$ (There is serial correlation.)

Table 3.6:

Decision Rule of Autocorrelation

Decision Rule



3.5.3 Inferential Analysis

This subsection will mainly discuss on 2 categories. Firstly, 3 types of panel regression model will be discussed which are Pooled Ordinary Least Square Model (Pooled OLS), Fixed Effects Model (FEM), and Random Effects Model (REM). Furthermore, 3 main tests namely Poolibility Hypothesis Testing, Hausman Test, and Breusch and Pagan Lagrange Multiplier Test will be discussed in the subsection as well in order to identify which types of panel regression model is suitable for this study.

3.5.3.1 Pooled Ordinary Least Square Model (Pooled OLS)

Pooled OLS can be used to derive unbiased and consistent estimates of parameters even when time constant attributes are present. There are assumptions of the model which are intercepts are constant, slopes are constant and time invariant across time which means no time effect. The assumptions consist of intercepts are fixed across banks, slopes are fixed across banks and no time effect. Furthermore, this model's error term is resistant to correlation between error terms meaning that each observation's

coefficients are similar and heteroscedasticity. While drawbacks of Pooled OLS are that all data is identical, and the estimator or coefficient value is inaccurate since the effects or specification of observations over time are not taken into consideration.

3.5.3.2 Fixed Effects Model (FEM)

One of the panel data regression models is FEM and the assumption is that the intercepts are different across the observations but there can be different situation, which are with constant slope coefficients and changing slope coefficients as well as with time effect and no time effect. FEM also assume that the independent variables are correlated with the individual specific error components. The intercept is permitted to be varied between the observations since each individual observation may have own unique properties or features and this condition is known as the heterogeneity. The different of slope coefficients indicate the effects of a determinant on dependent variable is different for each individual observation. Moreover, for the model with time effect, dummy variables will be assigned to examine the time effect. However, excessive number of dummy variables will reduce the degree of freedom and cause to the losses of information, other than leads to the high possibility of multicollinearity problem. Thus, it is important for this study to make sure that dummy variables number included may not be excessive so that the impact of time invariant variables could be identified.

3.5.3.3 Random Effects Model (REM)

REM is assumed to have different intercepts across the observations, constant slopes and have no time effect. It is assumed that an individual intercept is chosen at random from a wider population with a fixed mean value. After then, the individual intercept value is expressed as a difference

from the fixed mean value. REM is suitable to be applied when random intercept of each cross-sectional unit is uncorrelated with the regressors. Hence, it is important to aware of the use of Generalized Least Square (GLS) instead of using the OLS in estimating REM to obtain BLUE. Most importantly it is to avoid the non-constant error term which will leads to autocorrelation problem. In short, it is significant to ensure that the individual error components are not interrelated and are not correlate with cross-sectional or time series data in this study.

3.5.3.4 Poolibility Hypothesis Testing (Pooled OLS vs. FEM)

In this research, Poolibility hypothesis testing will be used to determine whether Pooled OLS or FEM is better.

The hypothesis is shown below:

$H_0 =$ Pooled Ordinary Least Square Model (Pooled OLS) is applied in this study.

$H_1 =$ Fixed Effects Model (FEM) is applied in this study.

Decision Rule: Reject H_0 if the p-value is less than the significance level. Otherwise, do not reject H_0 .

Researchers analyze the H_0 and reject H_0 if the p-value is smaller than alpha. If there is a rejecting decision, it means that in comparison to the Pooled OLS, FEM is a better fit for the study.

3.5.3.5 Breusch and Pagan Lagrange Multiplier Test (Pooled OLS vs. REM)

Breusch and Pagan Lagrange Multiplier Test is applied in this study in order to assist researchers in determining among Pooled OLS and REM that is more fitting. This is because the assumption under Pooled OLS and REM are different whereas Pooled OLS assume heterogeneity while the latter assume homogeneity. Moreover, under Breusch and Pagan Lagrange Multiplier Test, the decision rule is when alpha is larger than p-value, H_0 should be rejected. If the results comply with the decision rule, it implies REM is more preferable in this study.

Hypothesis testing is shown below:

H_0 = There is no random effect (Pooled OLS is preferable)

H_1 = There is random effect (REM is preferable)

Decision Rule: Reject H_0 if the Lagrange Multiplier (LM) statistics is bigger than critical value or the p-value is less than the significance level. Otherwise, do not reject H_0 .

When H_0 is rejected, it indicates that REM is more suitable than Pooled OLS in this research.

3.5.3.6 Hausman Test (FEM vs. REM)

Hausman Test was proposed by Mr. Jerry Hausman in year 1978. Besides, Hausman Test is to help researchers in deciding whether FEM or REM is more preferable in this study. This is because this study is utilizing panel data under 3 main types of panel regression model which namely REM, Pooled OLS and FEM. Thus, it is crucial in deciding which model is the

more appropriate under this study. Furthermore, in order to decide between FEM and REM, researchers will conclude that FEM is more appropriate in this study when the result illustrate rejection of H_0 as p-value is smaller than alpha. Hypothesis testing is shown below:

$H_0 =$ REM are consistent and efficient (REM is preferable)

$H_1 =$ FEM are inconsistent and inefficient (FEM is preferable)

Decision Rule: Reject H_0 if the p-value is less than the significance level. Otherwise, do not reject H_0 .

If alpha larger than p-value, H_0 should be rejected. If there is a rejecting decision, it means that in comparison to the REM, FEM is a better fit for the study.

3.6 Conclusion

To sum up everything in this chapter, it describes the sampling technique, type of data, sources of data, research design and methodologies acquired in this research. Moreover, researchers adopt panel data regression model in this study while the discussion of empirical results which running through EViews 12 will be continued in next chapter.

CHAPTER FOUR: DATA ANALYSIS

4.0 Introduction

The outcomes of empirical analysis obtained by EViews 12 will be discussed in detailed throughout this chapter. Furthermore, the statistical approaches will be discussed, namely descriptive analysis and inferential analysis. Besides, measurement of center and spread included under descriptive analysis while methodologies under inferential analysis which defined in Chapter 3 are performed then explained. Moreover, this chapter will describe diagnostic checks to confirm the correctness and reliability of the estimates and followed by a conclusion.

4.1 Descriptive Analysis

It mainly discusses and analyze descriptive analysis' result which include mean, median, maximum value, minimum value, and standard deviation generated by EViews 12 for Malaysia Domestic Islamic Banks before and during COVID-19 period. Mean refers to the average value which computed by the summation of the figures in the data set and divided by the total observations. Moreover, median indicates the center value of the data set after arranged from ascending order. Besides, standard deviation measures how far the data set appeared to be from mean value which determined by the square root of the variance. Greater standard deviation indicates data set generated larger spread from the mean value, vice versa.

4.1.1 Before COVID-19 Period

Table 4.1:

Results of Descriptive Statistic Before COVID-19 Period

	ROA	GDP	CA	BKLQ
Mean	0.532540	4.325000	16.86984	73.16714
Median	0.502794	4.450000	16.34850	73.40690
Maximum	1.080819	4.800000	20.69600	79.99981
Minimum	0.307186	3.600000	13.71200	65.17891
Standard deviation	0.168181	0.448836	1.966418	3.521113
Skewness	1.294328	-0.767346	0.369312	-0.094583
Kurtosis	4.346710	2.116614	2.048782	2.426067
Observations	44	44	44	44

Sources: Developed for this research

Notes: Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), and Bank Liquidity (BKLQ).

According to table 4.1, the mean value of return on assets (ROA) is 0.53% with a maximum value of 1.08% and minimum value of 0.31%. Further, the ROA has a median and standard deviation of 0.50% and 0.17%. Besides, from the perspective of macroeconomic determinants, the mean value of gross domestic product (GDP) is 4.33% with a median of 4.45%. Moreover, GDP showed the greatest value of 4.80% and lowest one of 3.60%. The GDP has a spread of 0.45% to the mean value.

In addition, the average value of capital adequacy (CA) is 16.87% with upper and lower limits of 20.70% and 13.71% correspondingly. The CA standard deviation is captured at 1.97% and yet with a median value of 16.35%. On the other hand, the average value of bank liquidity (BKLQ) is 73.17% among 11 Malaysia Domestic Islamic Banks for the before COVID-19 period. BKLQ have a median value of 73.41%. Additionally, BKLQ has recorded highest value of 80% and lowest value of 65.18%. BKLQ shows a standard deviation of 3.52%.

4.1.2 During COVID-19 Period

Table 4.2:

Results of Descriptive Statistic During COVID-19 Period

	ROA	GDP	CA	LN MORA	BKLQ
Mean	0.413188	-5.600000	17.52977	11.82457	74.06199
Median	0.372657	-3.000000	17.77900	17.59388	74.22563
Maximum	0.908915	0.700000	20.79800	20.05148	81.30522
Minimum	0.051530	-17.10000	14.23300	0.000000	65.94328
Standard Deviation	0.192619	6.893846	1.848887	9.072758	3.934686
Skewness	0.515527	-0.973998	0.100599	-0.545825	-0.322431
Kurtosis	3.101232	2.221669	1.811397	1.326765	2.514832
Observations	44	44	44	44	44

Sources: Developed for this research

Notes: Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), Moratorium (MORA), and Bank Liquidity (BKLQ).

Based on table 4.2, the mean value of ROA is 0.41%, the median value is 0.37% and the standard deviation is 0.19%. 0.91% and 0.05% are the maximum and minimum values for ROA. Besides, from the standpoint of macroeconomic factors, GDP is illustrating the average means of -5.60% with a median value of -3.00%. The values in the dataset deviate from the relative mean by 6.89% for the variable GDP. Furthermore, the largest GDP figure is +0.70% while the lowest GDP figure is -17.10%.

Other than that, the average value of CA is 17.53% among 11 Malaysia Domestic Islamic Banks for during COVID-19 period. CA included a minimum value of 14.23% and maximum value of 20.80%. The CA shows a standard deviation of 1.85% and yet a median value of 17.78%. On the other hand, the moratorium (MORA) is showing the average means of 11.82% on top of the standard deviation of 9.07%. Further, the MORA's greatest and smallest values are 20.05% and 0% while the median value is 17.59%. In addition, an average value of 74.06% is captured by BKLQ with a median value of 74.23%. BKLQ calculated both positive result for maximum and minimum rate at 81.31% and 65.94%, respectively. For the variable BKLQ, there is a 3.93% departure of the values in the dataset from its relative mean.

4.2 Inferential Analysis

This subsection includes two main subsections which are Panel Data Regression Model and Random Effects Model (REM). Panel Data Regression Model discusses two types of tests, namely Breusch and Pagan Lagrange Multiplier Test and Hausman Test for before and during COVID-19 period in order to identify type of model that is appropriate in this study. Furthermore, result of REM will be analyzed in this subsection.

4.2.1 Panel Data Regression Model

Result of Breusch and Pagan Lagrange Multiplier Test and Hausman Test which generated by EViews 12 for the before and during COVID-19 period will be discussed and analyzed since it indicated types of panel regression model that are appropriate for this study.

4.2.1.1 Before COVID-19 period

This subsection analyzes the result of Breusch and Pagan Lagrange Multiplier Test and Hausman Test which concluded REM is the most suitable and reliable model for before COVID-19 period in this study.

4.2.1.1.1 Breusch and Pagan Lagrange Multiplier Test

Table 4.3:

Results of Breusch and Pagan Lagrange Multiplier Test Before COVID-19 Period

	Test Hypothesis		
	Cross section	Time	Both
Breusch-Pagan	25.28853 (0.0000)	1.832313 (0.1759)	27.12084 (0.0000)

Sources: Developed for this research

In conclusion, REM is better at all levels of significance while comparing with the Pooled OLS.

4.2.1.1.2 Hausman Test

Table 4.4:

Results of Hausman Test Before COVID-19 Period

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.984054	3	0.2632

Sources: Developed for this research

In conclusion, REM is better at all levels of significance while comparing with the FEM.

4.2.1.2 During COVID-19 period

Breusch and Pagan Lagrange Multiplier Test and Hausman Test generated by EViews 12 will be examined which concluded REM is the most suitable and reliable model for during COVID-19 period in this study.

4.2.1.2.1 Breusch and Pagan Lagrange Multiplier Test

Table 4.5:

Results of Breusch and Pagan Lagrange Multiplier Test During COVID-19 Period

	Test Hypothesis		
	Cross section	Time	Both
Breusch-Pagan	4.408039 (0.0358)	0.560183 (0.4542)	4.968221 (0.0258)

Sources: Developed for this research

In conclusion, REM is preferable at the significance levels of 5% and 10% while comparing with the Pooled OLS.

4.2.1.2.2 Hausman Test

Table 4.6:

Results of Hausman Test During COVID-19 Period

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.117914	4	0.2754

Sources: Developed for this research

In conclusion, REM is better at all levels of significance while comparing with the FEM.

4.2.2 Random Effects Model (REM)

REM assumes different intercepts across the observations, constant slopes, and no time effect. It assumes individual intercept is random drawing from a larger population with a constant mean value.

4.2.2.1 Before COVID-19 period

According to the result obtained from this study, the REM is stated as follow:

$$ROA_{it} = 0.779426 - 0.055401(GDP)_{it} + 0.056904(CA)_{it} + 0.013220(BKLQ)_{it} + \varepsilon_{it} \quad (4.1)$$

Table 4.7:

Results of Random Effects Model (REM) Before COVID-19 Period

Variable	Coefficient	T-Statistic	P-value
C	0.779426	1.500119	0.1414
GDP	-0.055401	-1.990675*	0.0534
CA	0.056904	5.098505***	0.0000
BKLQ	0.013220	-2.336215**	0.0246
R-Square	0.509163		
F-statistic	13.83113 ***		
P-value (F statistics)	0.000002		

Sources: Developed for this research

*Notes: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. P-value is written in parentheses. Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), and Bank Liquidity (BKLQ).*

Based on table 4.7, R-squared measures the proportion of the total variation in ROA explained by the model. Therefore, according to the result, the R-squared value for before COVID-19 period is 0.509163, which indicates that the change in GDP, CA and BKLQ explains 50.92% of the variation in ROA. Furthermore, the p-value of the F-statistic for before COVID-19 period is 0.0000 which is lower than 1%, 5% and 10% significance level. Thus, it indicates that GDP, CA and BKLQ are significant to ROA for before COVID-19 period. Additionally, the F-statistic p-value indicates the overall model for before COVID-19 period gives a more accurate fit to the data compared to a model that without independent variables. Other than that, the constant coefficient shown in table 4.7 indicates when GDP, CA and BKLQ are zero, the estimated ROA is 0.78 percentage point. Besides, if GDP rises by 1 percent, on average, ROA drops by 0.055 percentage point, ceteris paribus. On the other hand, when CA rises by 1 percent, on average,

ROA increases by 0.057 percentage point respectively, *ceteris paribus*. In addition, if BKLQ increases by 1 percent, on average, ROA increases by 0.013 percentage point, *ceteris paribus*.

Table 4.8:

Comparison between expected and actual results before COVID-19 Period

Variables	Expected sign and significant	Results
GDP	Positive and significant	Negative and significant
CA	Positive and significant	Positive and significant
BKLQ	Positive and significant	Positive and significant

Sources: Developed for this research

Notes: Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), and Bank Liquidity (BKLQ).

Gross Domestic Product (GDP)

The empirical result differs from the predicted result because the expected relationship is positive while the empirical outcome is negative. Expected result shows a positive relationship which can be explained by individuals usually happen to have more cash or money with them during a strong economy and deposit it in a bank or make investment which lead to increasing the bank's lending operations and bringing the bank greater profit. Noting that when GDP is high, the chance of customer getting default is lower, and therefore probability of bad debt happens will be lower, resulting in better profits for the bank.

However, negative relationship is obtained in this research which can be explained by during economic downturns, policymakers would force banks to widen lending regulations in order to boost the economy which leads to loosen requirements for the borrowers on borrowing loans. As a result, there

will be a strong demand for loans, resulting in increased bank profitability. Along the business cycle, banks' total spending, including interest paid, may likewise follow a pro-cyclical pattern. Interest rates may rise as savings grow, while wages and operational costs may rise as labor markets were tighten during economic expansions. Resulting in higher cost and lower bank's profitability. Besides, during good economic development which enhances the business environment and reduce bank entry barriers. Consequently, the increasing competition will lead the bank's profitability lower.

Capital Adequacy (CA)

According to the table 4.8, Islamic Banks' CA are significant and positively correlated with its ROA. In this study, positive relationship is expected to be found between CA and ROA. The positive expected sign shows that CA has significant beneficial influence on the banks' earnings where it proves that sufficient banks' capital could increase the capability of bank to sustain during the financial crisis or when the economy is down regardless its bank size. Moreover, sufficient banks' capital could enable banks to have more opportunities to borrow funds or obtain higher loan amount at lower interest rate which leads to increase in banks profitability and financial stability even when the economy is going down.

Moreover, there is a strong correlation between CA and banks' ROA in order for a bank to compete in the global banking industry, huge amount of capital is required so that they have the ability to undergo additional uncertainties when dealing with the international trading activities. Hence, there is a positive relationship between CA and ROA of Islamic Bank before COVID-19 pandemic.

Bank Liquidity (BKLQ)

According to table 4.8, there is a positive and significant relationship between BKLQ and ROA of Islamic Banks. It indicates that banks with higher liquidity could perform better compared to less liquid banks. It is because if a bank holds more liquid assets, it will help the bank to reduce its default risk and generate higher revenue no matter in low or high capitalized bank. Moreover, sufficient bank liquidity could ensure the bank has the ability to face uncertainty and improve its financial performance. High bank liquidity allows a bank to be more bearable towards any unforeseen shocks before COVID-19 period and the bank will be able to remain profitable. For example, COVID-19 pandemic is unpredictable, and an adequate bank liquidity helps the bank to have more ability to bear with the risk and pressure when the pandemic hits. However, if a bank holds excess bank liquidity, its bank profitability could decrease. It is because holding liquid assets do not help the bank to generate much interest compared to investing. The opportunity cost of holding excess low-return assets would eventually higher than the profit earned if the bank chooses to invest the liquid assets in funding markets. Therefore, before COVID-19 period, bank liquidity should be managed well in order to be more resilient to any unforeseen crisis in the future.

4.2.2.2 During COVID-19 period

According to the result obtained from this study, the REM is stated as follow:

$$\text{ROA}_{it} = 0.549419 + 0.008702(\text{GDP})_{it} + 0.002395(\text{CA})_{it} - \beta_3 0.003286 \ln(\text{MORA})_{it} + 0.002273(\text{BKLQ})_{it} + \varepsilon_{it} \quad (4.2)$$

Table 4.9:

Results of Random Effects Model (REM) During COVID-19 Period

Variable	Coefficient	T-Statistic	P-value
C	0.549419	0.723880	0.4735
GDP	0.008702	2.245394 **	0.0305
CA	0.002395	0.119698	0.9053
LN MORA	0.003286	1.057133	0.2970
BKLQ	0.002273	-0.250871	0.8032
R-Square	0.111093		
F-statistic	1.218521		
P-value (F statistics)	0.318607		

Sources: Developed for this research

*Notes: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level. P-value is written in parentheses. Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), Moratorium (MORA), and Bank Liquidity (BKLQ).*

According to the results in table 4.9, the R-squared value for during COVID-19 period is 0.111093, which indicating 11.11% of the variance in ROA is described by changes in GDP, CA, MORA and BKLQ. Furthermore, the p-value of the F-statistic for during COVID-19 period is 0.318607 which is greater than 1%, 5% and 10% significance level. Thus, it indicates that GDP, CA, MORA and BKLQ are insignificant to ROA for during COVID-19 period. In addition, the F-statistic p-value examines each independent variables at the same time for during COVID-19 period in order to identify whether GDP, CA, MORA and BKLQ enhanced the fitness of the model or not. Other than that, the constant coefficient shown in table 4.9 indicate when GDP, CA, MORA and BKLQ are zero, the estimated ROA is 0.55 percentage point. Besides, if GDP rises by 1 percent, on average, ROA

increases by 0.0087 percentage point, *ceteris paribus*. On the other hand, when CA rises by 1 percent, on average, ROA increases by 0.0024 percentage point respectively, *ceteris paribus*. In addition, if MORA increases by 1 percent, on average, ROA rises by 0.0033 percentage point, *ceteris paribus*. Further, if BKLQ increases by 1 percent, on average, ROA increases by 0.0023 percentage point respectively, *ceteris paribus*.

Table 4.10:

Comparison between expected and actual results during COVID-19 Period

Variables	Expected sign and significant	Results
GDP	Positive and significant	Positive and significant
CA	Positive and significant	Positive and insignificant
LN MORA	Negative and significant	Positive and insignificant
BKLQ	Positive and significant	Positive and insignificant

Sources: Developed for this research

Notes: Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), Moratorium (MORA), and Bank Liquidity (BKLQ).

Gross Domestic Product (GDP)

Identical result is obtained between expected result and empirical result. This significant and positive result can be clarified by explaining positive influence of GDP growth rate also means that as a country's productive capacity decreases, real income drops, and banks become less confident in lending to clients and other banking operations. When output decreases, incomes drop and demand for products and services is reduced. In the sense that the banking system is a part of the economy, improvements in important areas of the economy would result in higher returns on the productive activities that banks engage in and fund. During bad economic condition,

individuals tend to have less money on hand and reduced the amount of deposit in bank or investment, which decreases the bank's lending operations and brings the bank less profit, yet the risk of default is high in low GDP condition and so bad debt will be higher which led to lower profit to the bank. Besides, both the decreasing of customer deposits and loans granted have positive impact on bank profitability. Since less customer deposits decreases capital for the bank to investment and low amount of loan will be offered to customers for personal investment during bad economic condition and lead to lower bank's return.

Capital Adequacy (CA)

The impact of CA on Islamic Banks' financial performance during COVID-19 pandemic period in Malaysia is insignificant and positive correlation. Positive relationship had been detected between CA and banks' ROA since huge capital is a necessity for banks to survive in the industry so that the bank could satisfy minimum legal requirements of capital reserve imposed by the legal financing institutions and to compete with other banks in international level. In short, when banks hold sufficient capital during financial crisis where banks may undergo operating losses, the additional capital could allow them to fulfil the legal requirements.

However, on the insignificant relationship between CA to the dependent variable, it can be said that greater CAR will lead to poorer bank financial performance which incompatible with previous findings. This is because at some situation, the ability of banks in obtaining higher capital is generally limited. For example, for investment activities in the finance viewpoint, it tends to be high risk high return, low risk low return thus, when banks engage more in lower risk investment to maintain its high capital adequacy ratio, which causes their profitability to be unfavorable to its investor and shareholders.

Moratorium (MORA)

Based on table 4.10, MORA has a positive relationship and are insignificant with Malaysia Domestic Islamic Banks' financial performance during COVID-19 period. Such result is contrast with the expected negative relationship. The main idea of the expected relationship is because of MORA heighten financial institutions' non-performing assets since it was just a short-run initiatives while the impact of pandemic is long last and still on going. Furthermore, increment of non-performing assets reduced interest income, one of the main financial resources for banks which in turn declined banks' lending activities. Moreover, due to lower lending activities, it curbs the economic growth which in turn impact banks' profitability since banks financial performance and economic situation are highly correlated.

On the other hand, greater non-performing assets forces banks to allocate higher financial resources as subsidies due to enhancement in term of provision of credit loss which strengthen banks' operating expenses. As a result, banks' profitability declined dramatically due to greater financial burden and lower financial resources. However, such positive results in this study were due to banks utilize MORA to further expand their business during COVID-19 pandemic. This is because banks had successfully deal with credit card customers to convert their credit card debt into a term loan by convinced them with the benefit of enjoying MORA during COVID-19 situation. As a result, banks' profitability strengthened since processing fees will be charged due to the conversion process.

Bank Liquidity (BKLQ)

According to table 4.10, the results shown that there is a positive and insignificant relationship between BKLQ and ROA of Islamic Banks during COVID-19. It indicates that when a bank is having more liquid assets, it will generate more revenue compared to those who do not hold sufficient liquid assets. If a bank is holding more liquid assets, it helps the bank to reduce the

default risk no matter in low or high capitalized banks. Furthermore, when a bank holds adequate liquid assets, it helps the bank to face any uncertainty or unforeseen crisis as the time goes by. Especially during COVID-19 period, there will be large amount of people to withdraw their savings from bank, thus, bank liquidity acts as a crucial element during the period. If a bank does not have sufficient bank liquidity, it will face bankruptcy risk when large amount of depositors wishes to withdraw their cash at the same period. However, bank liquidity should be managed properly because excess bank liquidity will eventually lead to unnecessary high financial cost. High financial cost will reduce the bank efficiency and reduce the bank profitability in the end. Therefore, during COVID-19 period, a bank ought to ensure their bank liquidity is maintained at a sufficient and adequate level in order to improve their bank profitability.

4.3 Diagnostic Checking

Result of diagnostic test which consists of normality test, multicollinearity, heteroscedasticity and autocorrelation will discussed in this subsection. It is crucial to perform and analyzed those tests since it will verify that the Classical Linear Regression Model (CLRM) assumptions and BLUE are not violated in this study.

4.3.1 Normality Test

Normality test is a key step in determining the central tendency measurements of data analysis. This is because the estimators will not normally distributed, unbiased, and consistent which lead to invalid results if there is a breach of normally assumption. Thus, result of JB Test will be adopted and analyzed for this study.

4.3.1.1 Before COVID-19 period

Table 4.11:

Result of Normality Test

Jarque-Bera Test	P-value
0.37	0.83

Sources: Developed for this research

4.3.1.2 During COVID-19 period

Table 4.12:

Result of Normality Test

Jarque-Bera Test	P-value
0.03	0.98

Sources: Developed for this research

Table 4.11 and 4.12 illustrate that there would be sufficient data to conclude the error term are normally distributed since the P-value 0.83 for before COVID-19 period and P-value 0.98 for during COVID-19 period are greater than 1%, 5% and 10% significance level. As a result, the estimators of the model are normally distributed as well.

4.3.2 Multicollinearity

Multicollinearity occurred when the independent variables in the study are highly correlated to each other in the econometric model. High correlation will hinder the independent variables in showing its effect and relationship

on the dependent variable. Thus, multicollinearity problem will cause the statistical inference to be not dependable and inaccurate. Pairwise correlation, VIF and TOL was the main indicator for detection in which the results will be discussed in this subsection.

4.3.2.1 Pairwise correlation

Pairwise correlation was one of the methods in detecting multicollinearity in this study for both models. The rule of thumb predicts that there will be substantial correlation between each independent variable when correlation of parameters is greater than 0.80.

4.3.2.1.1 Before COVID-19 period

Table 4.13:

Results of Pairwise Correlation among Independent Variables

	ROA	GDP	CA	BKLQ
ROA	1.00	-0.22	0.37	-0.37
GDP	-0.22	1.00	-0.17	-0.13
CA	0.37	-0.17	1.00	-0.02
BKLQ	-0.37	-0.13	-0.02	1.00

Sources: Developed for this research

Notes: Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), and Bank Liquidity (BKLQ).

4.3.2.1.2 During COVID-19 period

Table 4.14:

Results of Pairwise Correlation among Independent Variables

	ROA	GDP	CA	LN MORA	BKLQ
ROA	1.00	0.24	0.18	-0.03	-0.15
GDP	0.24	1.00	0.01	-0.47	0.04
CA	0.18	0.01	1.00	0.10	0.08
LN MORA	-0.03	-0.47	0.10	1.00	0.04
BKLQ	-0.15	0.04	0.08	0.04	1.00

Sources: Developed for this research

Notes: Return on Assets (ROA), Gross Domestic Product (GDP), Capital Adequacy (CA), Moratorium (MORA), and Bank Liquidity (BKLQ).

According to table 4.13, significant multicollinearity is absent between the variables for before COVID-19 period since the correlation figures do not exceed the rule of thumb of pairwise correlation, 0.80. Furthermore, based on table 4.14, independent variables also illustrate weak multicollinearity for during COVID-19 period, with correlation estimates that smaller than 0.80.

4.3.2.2 Variance Inflation Factor (VIF) and Tolerance (TOL)

VIF and TOL are one of the indicators in detecting multicollinearity in this study for both models. The rule of thumb indicates that there will be multicollinearity once the VIF is more than 10 while on the other hand TOL falls near to 0.

4.3.2.2.1 Before COVID-19 period

Table 4.15:

Results of VIF and TOL among Independent Variables

Independent Variable	VIF	$TOL = \frac{1}{VIF}$
GDP	1.16	0.86
CA	1.11	0.90
BKLQ	1.06	0.95

Sources: Developed for this research

Notes: Gross Domestic Product (GDP), Capital Adequacy (CA), and Bank Liquidity (BKLQ).

4.3.2.2.2 During COVID-19 period

Table 4.16:

Results of VIF and TOL among Independent Variables

Independent Variable	VIF	$TOL = \frac{1}{VIF}$
GDP	1.35	0.74
CA	1.02	0.98
LN MORA	1.37	0.73
BKLQ	1.02	0.98

Sources: Developed for this research

Notes: Gross Domestic Product (GDP), Capital Adequacy (CA), Moratorium (MORA), and Bank Liquidity (BKLQ).

Based on table 4.15, each of the independent variable for before COVID-19 period has modest multicollinearity since all of the VIF values are in the middle of 1 and 10 while the TOL values are around 1. In addition, according to table 4.16, all exogenous variable for during COVID-19 period did not exhibit serious multicollinearity. This is because all of the VIF values are in the middle of 1 and 10 while the TOL values are around 1.

4.3.3 Heteroscedasticity

If variation of error term changes accordingly to the values of independent variables, heteroscedasticity arises in which it violated the assumptions of BLUE. As a result, Breusch-Pagan test is being applied in this study in order to determine whether or not the error component in the models has uneven variance.

4.3.3.1 Before COVID-19 period

Table 4.17:

Result of Breusch-Pagan Test

Breusch-Pagan	P-Value
79.08	0.02

Sources: Developed for this research

4.3.3.2 During COVID-19 period

Table 4.18:

Result of Breusch-Pagan Test

Breusch-Pagan	P-Value
66.39	0.14

Sources: Developed for this research

Based on table 4.17, heteroscedasticity occurs in the model for before COVID-19 period at 5% and 10% significance level. This is because there is sufficient evidence to reject the null hypothesis as the P-value (0.02) is less than 5% and 10% significance level. Nevertheless, homoscedasticity occurs at 1% significance level. The occurrence of heteroscedasticity caused the variance of estimators biased and enhanced the range of confidence interval in which it caused misleading conclusion generated.

According to table 4.18, homoscedasticity occurs in the model for during COVID-19 period at all significance level. This is because there is sufficient evidence on not to reject the null hypothesis as the P-value (0.14) is larger than 5% and 10% significance level.

4.3.4 Autocorrelation

Autocorrelation happens when error terms are correlated. Furthermore, existence of autocorrelation lead to the violation of BLUE. This is because the estimators will no longer efficient which further lead to invalid result. Thus, Durbin-Watson d Test adopt in this study for the detection of autocorrelation.

4.3.4.1 Before COVID-19 period

Table 4.19:

Result of Autocorrelation Test

Test Statistic	1.55
-----------------------	------

$0 \quad d_L=1.20 \quad d_U=1.47 \quad 2 \quad 4-d_U=2.53 \quad 4-d_L=2.80 \quad 4$

Sources: Developed for this research

4.3.4.2 During COVID-19 period

Table 4.20:

Result of Autocorrelation Test

Test Statistic	1.69
-----------------------	------

$0 \quad d_L=1.16 \quad d_U=1.53 \quad 2 \quad 4-d_U=2.47 \quad 4-d_L=2.84 \quad 4$

Sources: Developed for this research

Based on table 4.19 illustrates that there is no autocorrelation problem for before COVID-19 period. This is because the d-test (1.55) is fall between the dU (1.47) and 4- dU (2.53). Moreover, according to table 4.20, during COVID-19 period is having the same result with before COVID-19 period

in which there is no autocorrelation problem. This is because the d-test (1.69) is fall between the dU (1.53) and 4- dU (2.47).

4.4 Conclusion

In conclusion, data is regressed in the form of REM by utilizing EViews 12 for before and during COVID-19 period. This is because the result of Breusch and Pagan Lagrange Multiplier and Hausman Test indicated REM is better than Pooled OLS and FEM for both periods. Furthermore, the REM has fulfilled the CLRM assumptions since it achieved normality, homoscedasticity, did not have the autocorrelation problem, and without serious multicollinearity issue. Thus, all the estimators in this study are BLUE which lead to valid and reliable hypothesis testing. In addition, GDP, CA, and BKLQ are having significant relationship with ROA for before COVID-19 period. Besides, CA and BKLQ incur positive relationship with ROA while GDP have a negative relationship with dependent variables, ROA for before COVID-19 period. Meanwhile, for during COVID-19 period, GDP is significantly explaining its relationship with ROA except CA, MORA, and BKLQ which are insignificant towards ROA. Other than that, all the independent variables, namely GDP, CA, MORA, and BKLQ have positive relationship with ROA for during COVID-19 period. Last but not least, the next chapter is about the discussion of major findings, implications of the study, limitations of the study and recommendations for future study.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

The final section describes all of the other chapters done in this paper. Besides, the major findings of this research were discussed to verify the research objectives and hypotheses which indicated throughout Chapter 1. In this chapter, implications of research will be explained from the perspectives of policymakers, financial institutions, investors, and future researchers. Limitations of study are also being addressed and some recommendations will be suggested according to the limitations. Lastly, a conclusion is made to conclude the whole research.

5.1 Discussion of Major Findings

Determinants such as gross domestic product (GDP), capital adequacy (CA), moratorium (MORA), and bank liquidity (BKLQ) that significantly affect the Malaysia domestic Islamic Banks' return on assets (ROA) for before and during COVID-19 period has been analyzed in this study. Moreover, GDP, CA, and BKLQ are significant in explaining their relationship between ROA which are the endogenous variables to examine banks' financial performance. In this study, 11 Malaysia domestic Islamic Banks are chosen as the sample size.

5.1.1 Before COVID-19 period

Table 5.1:

Result of Statistical Analysis

Random Effects	Coefficients	P-value	Result
Model (REM):			
Gross Domestic Product	-0.055401	0.0534*	Negative and significant
Capital Adequacy	0.056904	0.0000***	Positive and significant
Bank Liquidity	0.013220	0.0246**	Positive and significant
Significance of Model (F Test)		0.0000***	Model is significant

Sources: Developed for this research

*Notes: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.*

5.1.1.1 Gross Domestic Product (GDP)

Based on the result summarized in table 5.1, GDP has a significant negative relationship towards banks profitability. It indicates that if GDP increases by 1%, on average, ROA reduces by 0.055 percentage point, ceteris paribus. Empirical finding relationship is supported by some researchers and explained that higher GDP rate which is in a good economic growth condition will lead to a lower banks' profitability. In the instance of commercial and saving banks in the United Kingdom, Muhammad Sajid

(2014), revealed that GDP growth is inversely related to bank profitability. They claimed that countries with higher GDP frequently have a more developed banking sector, which leads to higher levels of competitive profit since the developed banks are matured enough to compete in market. During good economic development will enhance the business environment and reduce bank entry barriers. Consequently, the increasing competition will lead the bank's profitability lower. According to Combey and Togbenou (2016), they discovered that economic growth which known as GDP is adversely related to banks' profitability in a long-term. They explained that as during the economy grows or expands rapidly, society becomes wealthier and the need for financial services, such as loans, decreases. While Robin et al. (2018), explained that during good economic condition, policy makers will require bank to widen the regulation on lending to improve the economic which leads to have more borrowings at lower interest rate which resulting in higher demand of loan service. Therefore, high demand of loan will occur and lead to higher profitability of the bank even economy is going down.

5.1.1.2 Capital Adequacy (CA)

According to this study, the results showed that there is a positive relationship on CA to Islamic Banks' ROA before the COVID-19 period. It illustrates that when CA rises by 1 percent, on average, ROA increases by 0.057 percentage point respectively, *ceteris paribus*. Besides, CA is significantly affecting ROA as well. The empirical result was similar to this study's expectations where it showed positive relationship and significant at significance level of 1%, 5% and 10%. These results concluded are in line with some of the previous researchers which explained that when Islamic banks own higher capital adequacy ratio, it will lead to a higher banks' profitability as well. According to Lee et al. (2019), when a bank holds additional fund, it allows the bank to enjoy lower capitalization cost, at the same time, it generally reduces the likelihood for a bank to go bankrupt.

Moreover, according to Okoye et al. (2017), the study emphasized on the importance of capital adequacy that banks should hold sufficient capital because it acts as an assistance for bank in performing their daily operations and absorbing any accidental losses occurred.

5.1.1.3 Bank Liquidity (BKLQ)

According to the study, the results showed that there is positive relationship between BKLQ and ROA before COVID-19 period which matched with the hypothesis expected positive sign. This is because the result showed that if there are 1 percent increases in BKLQ, on average, ROA increases by 0.013 percentage point, *ceteris paribus*. It was supported by the study of Charmler et al. (2018) since the study has shown a positive association between bank liquidity and bank performance. Furthermore, the results claimed that banks with higher liquidity could perform better as compared to less liquid banks. In the research of Khasharmeh (2018), it is claimed that bank liquidity strongly affects the profitability of Islamic bank over the period of 2010 to 2015. In other words, the bank profitability is depending on the large extent upon the bank liquidity. According to Lucy et al. (2018), the study supported with the evidence that the study existed a positive relationship between bank liquidity and return on assets. However, according to Elsharif (2016), if a bank holds excess bank liquidity, its bank profitability could decrease. It is because holding liquid assets will not help the bank to generate much interest as compared to investing. The opportunity cost of holding excess low-return assets would eventually higher than the profit earned if the bank chooses to invest the liquid assets in funding markets. Hence, liquidity management need to be handled efficiently in the banking industry in order to get a balance between the bank liquidity and maximize the bank profitability.

5.1.2 During COVID-19 period

Table 5.2:

Result of Statistical Analysis

Random	Coefficients	P-value	Result
Effects Model			
(REM):			
Gross Domestic Product	0.008702	0.0305**	Positive and significant
Capital Adequacy	0.002395	0.9053	Positive and insignificant
Moratorium	0.003286	0.2970	Positive and insignificant
Bank Liquidity	0.002273	0.8032	Positive and insignificant
Significance of Model (F Test)		0.3186	Model is insignificant

Sources: Developed for this research

*Notes: *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.*

5.1.2.1 Gross Domestic Product (GDP)

The empirical result was supported by some researchers and explained that lower GDP rate which is in a bad economic growth condition will lead to a

lower banks' profitability. This positive relationship has proven by the study of Yuksel et al. (2018), they discovered that during bad economic condition in post-Soviet country, individuals are in a bad condition as a lot of people without job, income and asset. However, they are allowed to take the loan so eventually these individuals will face difficulty in repaying the loan which reduces the bank's lending operations and brings the bank less profit. Based on Bouzgarrou et al. (2018), they found a positive relationship during good economic condition and a negative relationship during financial crisis. They explained that no matter how good or bad the economic condition is, an experienced banking institution will be able to cope with the situation as they adopt good managerial and operational skills. They explained their findings by the fact that experienced banks improve themselves by upgrading technology and applying prudential practices. According to Olokoyo (2019), this significant and positive result can be clarified by explaining positive influence of GDP growth rate also means that as a country's trade and productive capacity increases, real income rises, and banks become more confident in lending to clients and other banking operations. When output increases, incomes rise and demand for products and services rises. In the sense that the banking system is a part of the economy, improvements in important areas of the economy would result in higher returns on the productive activities that banks engage in and fund.

5.1.2.2 Capital Adequacy (CA)

According to this study, the results showed that CA is positively affecting ROA of Islamic Bank during COVID-19 period, at the same time, it is insignificantly affecting the dependent variable which is opposite to the expected results in this study. This positive sign between the variables was supported by previous studies which explained that higher capital adequacy during COVID-19 pandemic period will lead to higher banks' profitability. Based on the previous researchers which include Dong (2021); Robin et al. (2018), their studies have proven similar results with this research as well.

This is because banks are able to enjoy lower interest rate charged on its borrowings which enhance banks' financial strength and stability even during economy recession if they hold sufficient capital in hand. On the insignificant of CA to ROA, it can be explained by Chalise (2019) which generate an insignificant result between the capital adequacy and the dependent variables. The studies have proved that when the capital adequacy ratio is lower, the banks' profitability will be higher. In other words, boosting the banks' capital could not be served as a remedy for poor performance banks but in fact, more strategies are required to be practiced maximizing the banks' capital level than only replenishing its capital.

5.1.2.3 Moratorium (MORA)

MORA is positively affecting ROA of Islamic Bank during COVID-19 period. This is because the result showed that if MORA increases by 1 percent, on average, ROA rises by 0.0033 percentage point, *ceteris paribus*. It differs from the expected which supported by the study of Amir Shaharuddin (2020), Drabancz et al. (2021), Dey and Wang (2021), Kumar (2020), and Lohia (2021). However, the empirical result of positive relationship is supported by the study of Somasundaram (2020) and explained that banking institutions attempted to profit from the moratorium instruments. This is because bankers are willing to convert their credit card customers' transaction into a term loan by convincing those customers with the benefit of enjoying MORA during COVID-19 situation from clients' perspective. This is because originally, credit card clients are not considered term loan clients who are not entitled to moratorium. Nevertheless, such willingness of bankers on such conversion were mainly due to profit purposes instead of stand from customers' perspective. This is because banks will earn interest from term loans and yet processing fee for the conversion.

5.1.2.4 Bank Liquidity (BKLQ)

The positive correlation between BKLQ and ROA during COVID-19 period is matched with the hypothesis expected positive sign which supported by studies of Ferrouhi (2014), Elsharif (2016), Tran et al. (2016) and Demirgüç-Kunt et al. (2021). According to Ferrouhi (2014), the study revealed the importance of sufficient bank liquidity to cope with the adverse conditions during financial crisis 2007. According to Elsharif (2016), it stated that when a bank holds adequate liquidity assets, it helps to improve a bank's profitability. It is because sufficient bank liquidity helps the banks to absorb any unpredictable financial crisis and unforeseen shock which might cause by an unexpected demand in decreasing of liabilities and yet increasing in assets of a bank. Furthermore, according to the study of Tran et al. (2016), it stated that if a bank is holding more liquid assets, it helps the bank to reduce the default risk no matter in low or high capitalized banks. Especially during COVID-19 period, there will have large amount of people withdrew their savings from bank, and thus bank liquidity acts as a crucial element during the period. According to the research of Demirgüç-Kunt et al. (2021), the research was conducted by using the data from March to April 2020 which is during COVID-19 period. The research concluded that liquidity support has greater impact towards the bank abnormal returns. They found that illiquid banks had benefited from the liquidity supports during the period. Hence, it is concluded that BKLQ has large positive impact on ROA during COVID-19 period.

5.2 Implications of Study

This study investigates determinants that impact the Malaysian Domestic Islamic Banks' financial performance for before and during the COVID-19 period. Financial performance of banks is key determinants for the growth of market and economy of a country. Thus, the policymakers, financial institutions, future researchers, and investors should be involved in this study.

Current research allows policymakers such as government and Central Bank of Malaysia to identify the determinants that significantly impact the profitability of Islamic Banks before and during the pandemic which ultimately affecting the economy growth in Malaysia. From the findings from chapter 4, the GDP variable showed a negative relationship with profitability of banks before the pandemic while it occurred with a positive relationship with financial performance of banks during the pandemic. Thus, comparison able to perform by policymakers and Central Bank towards banks' financial performance among the pre-COVID-19 and during COVID-19 period. They can make judgement whether the economy of Malaysia will be expanding or contracting in different economy condition to make precautions for the next crisis. Besides, the policymakers and Central Bank could make modifications on the monetary and fiscal policies by referring to the result of this study, as a guideline, especially in terms of the economic growth in order to make recovery and reformation of the economy in Malaysia if crisis happened. Moreover, they can also forecast the financial health and stability condition of banks based on the result of this study and promptly take action once the COVID-19 condition turns better.

Furthermore, this research is significant for financial institutions in determine factors that will influence the banks' prospective earnings. Banks' profitability in term of reserves will be impact by the capital adequacy, moratorium, and bank liquidity. Bank reserves are required to ensure the ability of banks to cover themselves and support the nation financially during economic downturn. By referring to this study, financial institutions would be able to realize the important for banks to hold enough or excess cash and liquid assets at any time in order to prevent the panic result from epidemic. Also, financial institutions can make comparison with regards to the existence of moratorium before and during the pandemic in affecting banks' account receivables. This study encourages financial institutions to devise better bank reserves management as precaution method and to ensure that each financial transaction is a precise and informed decision to maintain the cash flow.

In addition, this study could be served as a guidance for the future researchers to do the similar studies. This is because this study showed the differences between each variable in impacting the profitability of Islamic Banks in Malaysia. By referring to this study, future researchers can make judgement on what variables should be taken in their studies with similar topic. For instances, they can take GDP variable as the benchmark since this variable has shown the significant relationship with profitability of banks before and during the pandemic as shown in chapter 4. While the other variables showed different results among the two period in this study, thus future researchers can decide to look for other determinants. For example, macroeconomic factors which consists of inflation rate and unemployment rate while bank specific factors which refer to the management efficiency and bank size can be included to find out their correlation with the earnings of banks.

Last but not least, this research is important for individuals which refer to capitalist and stakeholders that interested on financially engage with local Islamic Banks. This is because this study provides information on how Malaysia's Domestic Islamic Banks perform towards the pandemic. Foreign investors who wish to make investment in Malaysia's Islamic Banking sector will be able to know the relationship and significance between the selected variables, especially the macroeconomic variable and the financial performance of banks by referring to the findings. They can refer to this study to have a clear look on the different performance of the banks before and during the pandemic in order to make wise investment decision and identify the right time to make investment.

5.3 Limitations of Study

The Malaysia domestic Islamic Banks' financial performance for before and during COVID-19 period is the major discussion throughout this study. However, there are few constraints faced in this study.

In this study, it is adopting 11 Domestic Islamic Banks in Malaysia and quarterly bank-level data from January 2019 until December 2019 which is before COVID-

19 period whereas January 2020 until December 2020 which represents during COVID-19 period. However, the restrictions faced in this study was solely focus on before and during COVID-19 period only. During the research, COVID-19 pandemic is still ongoing, and the study towards post COVID-19 period was unable to conduct. This may cause the result of this study to be indefinite as the COVID-19 pandemic is still ongoing and researchers were unable to collect all the data for during and after the pandemic period. Therefore, researchers faced obstacles in obtaining the accurate results to make comparison between the impact on Islamic Banks' financial performance before, during and after the COVID-19 period.

Another limitation that faced in this study is inadequate database in independent variables. In this study, the independent variables adopted are GDP, CA, MORA, and BKLQ which are considered as limited variables as compared to previous studies. Besides from the variables above, there are still other internal and external factors that will affect the ROA of Islamic Banks in Malaysia such as bank size and government intrusion. Thus, limited variables in this study affect the overall results to be less accurate since it did not fully consider all the possible variables that might affect the Islamic Banks' profitability.

The last limitation is that the study was only conducted and focused on the Islamic Banks in Malaysia. Every country is distinctive, and they have their own distinct cultures, economics conditions, rules and regulations. Since this research is only focusing on the 11 Islamic Banks in Malaysia, it is not recommended for the researchers to apply the findings into the Islamic Banks in other countries. It is advised that this research will serve as a reference only because the findings and explanations do not wholly represent the Islamic Banks' performance in the whole world. However, this research will bring benefit for the researchers who wish to perform related study among Islamic Banks in other countries such as Iran, Saudi Arabia, United Arab Emirates, and others Islamic countries.

5.4 Recommendations for Future Research

If future researchers wish to design this study again, there are a few changes that researchers would like to suggest. Most crucially, this study would suggest going for a longer period to be able to capture the involvement across the whole research process from initial design through to dissemination. Future researchers are recommended to further study by performing comparison between pre, during, and post COVID-19 pandemic period. This is because the pandemic is still ongoing when the research was being conducted. By doing so, there will have comparison between 3 different periods and yet the sample size and time range will be larger as well. As a result, the degree of freedom will be raised due to the consideration of larger sample size which will lead to greater symmetric data distribution from which to generate more convincing and accurate results.

Future researchers are also recommended to use the other indicators or dependent variable to carry out the study. Most of the previous studies used ROA as an indicator so instead of using ROA as proxy for financial performance, researchers can use alternative indicators such as NPM and ROE to conduct comparable research. Besides, researchers can also include multiple indicators in the study as a method of testing and correcting for errors made in measuring the relationship so that the results will be more precise.

Three out of four exogenous variables have been studied in this study, CA, MORA, and BKLQ appeared to have insignificant impact on Islamic Bank's financial performance during COVID-19 period. According to Adu et al. (2016), they concluded that inflation has a statistically significant negative impact on bank profitability. However, based on Hidayat et al. (2020), he concluded that inflation is positively affecting bank profitability. Thus, future researchers are recommended to consider about the inclusion of inflation as a factor in their research so that result will be more accurate and reliable since the results from previous studies were inconsistent.

5.5 Conclusion

The goal of this study is to examine the determinants that have a significant impact on the financial performance of Malaysian Domestic Islamic Banks before and during the COVID-19 period. GDP, CA, MORA, and BKLQ are employed to measure the ROA of Domestic Islamic Banks in Malaysia. Panel data regression model is being adopted in this study by applying secondary data to do the data analysis. REM is chosen as the most suitable model in this study.

While reviewing the results of data analysis, before the COVID-19 period, the results of REM model revealed that each independent variable includes GDP, CA, and BKLQ are significant to the dependent variable. On the other hand, during the COVID-19 period, the REM model revealed that except the GDP that showed significant correlation with the dependent variable, CA, MORA, and BKLQ are insignificant to the return on assets.

In the nutshell, this study was successful in identifying relationship and significance of determinants that impact Malaysia Domestic Islamic Banks' financial performance before and during COVID-19 period.

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APPENDICES

Appendix 4.1: Results of Descriptive Statics before COVID-19 Period

	ROA	GDP	CA	BKLQ
Mean	0.532540	4.325000	16.86984	73.16714
Median	0.502794	4.450000	16.34850	73.40690
Maximum	1.080819	4.800000	20.69600	79.99981
Minimum	0.307186	3.600000	13.71200	65.17891
Std. Dev.	0.168181	0.448836	1.966418	3.521113
Skewness	1.294328	-0.767346	0.369312	-0.094583
Kurtosis	4.346710	2.116614	2.048782	2.426067
Jarque-Bera	15.61041	5.748698	2.659030	0.669502
Probability	0.000408	0.056453	0.264606	0.715516
Sum	23.43175	190.3000	742.2730	3219.354
Sum Sq. Dev.	1.216252	8.662500	166.2724	533.1242
Observations	44	44	44	44

Appendix 4.2: Results of Descriptive Statics during COVID-19 Period

	ROA	LNLMORA	GDP	CA	BKLQ
Mean	0.413188	11.82457	-5.600000	17.52977	74.06199
Median	0.372657	17.59388	-3.000000	17.77900	74.22563
Maximum	0.908915	20.05148	0.700000	20.79800	81.30522
Minimum	0.051530	0.000000	-17.10000	14.23300	65.94328
Std. Dev.	0.192619	9.072758	6.893846	1.848887	3.934686
Skewness	0.515527	-0.545825	-0.973998	0.100599	-0.322431
Kurtosis	3.101232	1.326765	2.221669	1.811397	2.514832
Jarque-Bera	1.967756	7.317593	8.067560	2.664306	1.193932
Probability	0.373858	0.025763	0.017707	0.263908	0.550479
Sum	18.18029	520.2812	-246.4000	771.3100	3258.728
Sum Sq. Dev.	1.595396	3539.543	2043.580	146.9905	665.7155
Observations	44	44	44	44	44

Appendix 4.3: Results of Breusch and Pagan Lagrange Multiplier Test before COVID-19 Period

Lagrange Multiplier Tests for Random Effects
Null Hypothesis: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	25.28853 (0.0000)	1.832313 (0.1759)	27.12084 (0.0000)
Honda	5.028770 (0.0000)	-1.353629 (0.9121)	2.598717 (0.0047)
King-Wu	5.028770 (0.0000)	-1.353629 (0.9121)	1.228532 (0.1096)
Standardized Honda	5.780205 (0.0000)	-0.883097 (0.8114)	0.490533 (0.3119)
Standardized King-Wu	5.780205 (0.0000)	-0.883097 (0.8114)	-0.768847 (0.7790)
Gourieroux, et al.	--	--	25.28853 (0.0000)

Appendix 4.4: Results of Breusch and Pagan Lagrange Multiplier Test during COVID-19 Period

Lagrange Multiplier Tests for Random Effects
Null Hypothesis: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	4.408039 (0.0358)	0.560183 (0.4542)	4.968221 (0.0258)
Honda	2.099533 (0.0179)	-0.748454 (0.7729)	0.955357 (0.1697)
King-Wu	2.099533 (0.0179)	-0.748454 (0.7729)	0.352146 (0.3624)
Standardized Honda	2.699635 (0.0035)	0.189388 (0.4249)	-1.407921 (0.9204)
Standardized King-Wu	2.699635 (0.0035)	0.189388 (0.4249)	-1.881088 (0.9700)
Gourieroux, et al.	--	--	4.408039 (0.0455)

Appendix 4.5: Results of Hausman Test before COVID-19 Period

Correlated Random Effects – Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq Statistic	Chi-Sq d.f.	Prob.
Cross-section random	3.984054	3	0.2632

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
GDP	-0.045095	-0.055401	0.000028	0.0524
CA	0.068183	0.056904	0.000035	0.0554
BKLQ	-0.011336	-0.013220	0.000006	0.4570

Cross-section random effects test equation:

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/15/22 Time: 16:11
Sample: 2019Q1 2019Q4
Periods included: 4
Cross-sections included: 11
Total panel (balanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.406730	0.570671	0.712723	0.4815
GDP	-0.045095	0.028333	-1.591615	0.1220
CA	0.068183	0.012619	5.403227	0.0000
BKLQ	-0.011336	0.006199	-1.828485	0.0774

Effects Specification

Cross-section fixed (dummy variables)			
R-squared	0.857897	Mean dependent var	0.532540
Adjust R-squared	0.796319	S.D. dependent var	0.168181
S.E. of regression	0.075902	Akaike info criterion	-2.065375
Sum squared resid	0.172834	Schwarz criterion	-1.497679
Log likelihood	59.43826	Hannan-Quinn criter.	-1.854846
F-statistic	13.93284	Durbin-Watson stat	2.084329
Prob(F-statistic)	0.000000		

Appendix 4.6: Results of Hausman Test during COVID-19 Period

Correlated Random Effects – Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq Statistic	Chi-Sq d.f.	Prob.
Cross-section random	5.117914	4	0.2754

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LNLMORA	0.003961	0.003286	0.000001	0.5306
GDP	0.009042	0.008702	0.000001	0.7107
CA	-0.037695	0.002395	0.000827	0.1632
BKLQ	0.007654	-0.02273	0.000128	0.3802

Cross-section random effects test equation:

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/16/22 Time: 13:02
Sample: 2020Q1 2020Q4
Periods included: 4
Cross-sections included: 11
Total panel (balanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.510943	1.351895	0.377945	0.7082
LNLMORA	0.003961	0.003290	1.204113	0.2383
GDP	0.009042	0.003982	2.270455	0.0308
CA	-0.037695	0.035029	-1.076104	0.2908
BKLQ	0.007654	0.014493	0.528097	0.6015

Effects Specification

Cross-section fixed (dummy variables)				
R-squared	0.587213		Mean dependent var	0.413188
Adjust R-squared	0.387937		S.D. dependent var	0.192619
S.E. of regression	0.150695		Akaike info criterion	-0.682197
Sum squared resid	0.658558		Schwarz criterion	-0.073951
Log likelihood	30.00834		Hannan-Quinn criter.	-0.456630
F-statistic	2.946730		Durbin-Watson stat	2.455166
Prob(F-statistic)	0.006769			

Appendix 4.7: Results of Pooled Ordinary Least Square Model (POLS) before COVID-19 Period

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/15/22 Time: 16:09
Sample: 2019Q1 2019Q4
Periods included: 4
Cross-sections included: 11
Total panel (unbalanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.795087	0.588231	3.051669	0.0040
GDP	-0.082565	0.050080	-1.648664	0.1071
CA	0.028144	0.011330	2.484077	0.0173
BKLQ	-0.018864	0.006294	-2.997229	0.0047
<hr/>				
R-squared	0.319319	Mean dependent var		0.532540
Adjusted R-squared	0.268268	S.D. dependent var		0.168181
S.E. of regression	0.143864	Akaike info criterion		0.953382
Sum squared resid	0.827879	Schwarz criterion		0.791183
Log likelihood	24.97441	Hannan-Quinn criter.		0.893231
F-statistic	6.254900	Durbin-Watson stat		0.607961
Prob(F-statistic)	0.001389			

Appendix 4.8: Results of Pooled Ordinary Least Square Model (POLS) during COVID-19 Period

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/16/22 Time: 12:59
Sample: 2020Q1 2020Q4
Periods included: 4
Cross-sections included: 11
Total panel (unbalanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.748529	0.594467	1.259160	0.2155
LN MORA	0.001958	0.003647	0.536816	0.5944
GDP	0.007962	0.004777	1.666699	0.1036
CA	0.018422	0.015800	1.165947	0.2507
BKLQ	-0.008599	0.007388	-1.163480	0.2516
R-squared	0.121474	Mean dependent var		0.413188
Adjusted R-squared	0.031369	S.D. dependent var		0.192619
S.E. of regression	0.189574	Akaike info criterion		0.381428
Sum squared resid	1.401596	Schwarz criterion		0.178679
Log likelihood	13.39142	Hannan-Quinn criter.		0.306239
F-statistic	1.348138	Durbin-Watson stat		1.164610
Prob(F-statistic)	0.269576			

Appendix 4.9: Results of Fixed Effect Model before COVID-19 Period

Dependent Variable: ROA
 Method: Panel Least Squares
 Date: 01/15/22 Time: 16:12
 Sample: 2019Q1 2019Q4
 Periods included: 4
 Cross-sections included: 11
 Total panel (unbalanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.406730	0.570671	0.712723	0.4815
GDP	-0.045095	0.028333	-1.591615	0.1220
CA	0.068183	0.012619	5.403227	0.0000
BKLQ	-0.011336	0.006199	-1.828485	0.0774

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.857897	Mean dependent var	0.532540
Adjusted R-squared	0.796319	S.D. dependent var	0.168181
S.E. of regression	0.075902	Akaike info criterion	-2.065375
Sum squared resid	0.172834	Schwarz criterion	-1.497679
Log likelihood	59.43826	Hannan-Quinn criter.	-1.854846
F-statistic	13.93184	Durbin-Watson stat	2.084329
Prob(F-statistic)	0.000000		

Appendix 4.10: Results of Fixed Effect Model during COVID-19 Period

Dependent Variable: ROA
Method: Panel Least Squares
Date: 01/16/22 Time: 13:03
Sample: 2020Q1 2020Q4
Periods included: 4
Cross-sections included: 11
Total panel (unbalanced) observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.510943	1.351895	0.377945	0.7082
LNMOA	0.003961	0.003290	1.204113	0.2383
GDP	0.009042	0.003982	2.270455	0.0308
CA	-0.037695	0.035029	-1.076104	0.2908
BKLQ	0.007654	0.014493	0.528097	0.6015

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.587213	Mean dependent var	0.413188
Adjusted R-squared	0.387937	S.D. dependent var	0.192619
S.E. of regression	0.150695	Akaike info criterion	-0.682197
Sum squared resid	0.658558	Schwarz criterion	-0.073951
Log likelihood	30.00834	Hannan-Quinn criter.	-0.456630
F-statistic	2.946730	Durbin-Watson stat	2.455166
Prob(F-statistic)	0.006769		

Appendix 4.11: Results of Random Effects Model (REM) before COVID-19 Period

Dependent Variable: ROA
Method Panel EGLS (Cross-section random effects)
Date: 01/15/22 Time: 16:10
Sample: 2019Q1 2019Q4
Periods included: 4
Cross-sections included: 11
Total panel (balanced) observations: 44
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.779426	0.519576	1.500119	0.1414
GDP	-0.055401	0.027830	-1.990675	0.0534
CA	0.056904	0.011161	5.098505	0.0000
BKLQ	-0.013220	0.005659	-2.336215	0.0246

Effects Specification		S.D.	Rho
Cross-section random		0.128258	0.7406
Idiosyncratic random		0.075902	0.2594

Weighted Statistics			
R-squared	0.509163	Mean dependent var	0.151101
Adjusted R-squared	0.472350	S.D. dependent var	0.107051
S.E. of regression	0.077762	Sum squared resid	0.241875
F-statistic	13.83113	Durbin-Watson stat	1.553243
Prob(F-statistic)	0.000002		

Unweighted Statistics			
R-squared	0.199195	Mean dependent var	0.532540
Sum squared resid	0.973981	Durbin-Watson stat	0.385727

Appendix 4.12: Results of Random Effects Model (REM) during COVID-19 Period

Dependent Variable: ROA
Method Panel EGLS (Cross-section random effects)
Date: 01/15/22 Time: 16:10
Sample: 2019Q1 2019Q4
Periods included: 4
Cross-sections included: 11
Total panel (balanced) observations: 44
Swamy and Arora estimator of component variances

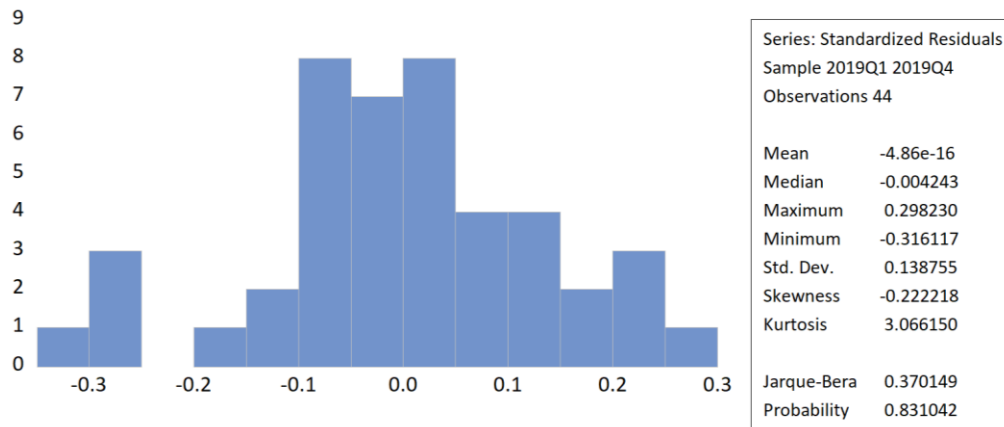
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.779426	0.519576	1.500119	0.1414
GDP	-0.055401	0.027830	-1.990675	0.0534
CA	0.056904	0.011161	5.098505	0.0000
BKLQ	-0.013220	0.005659	-2.336215	0.0246

Effects Specification		S.D.	Rho
Cross-section random		0.128258	0.7406
Idiosyncratic random		0.075902	0.2594

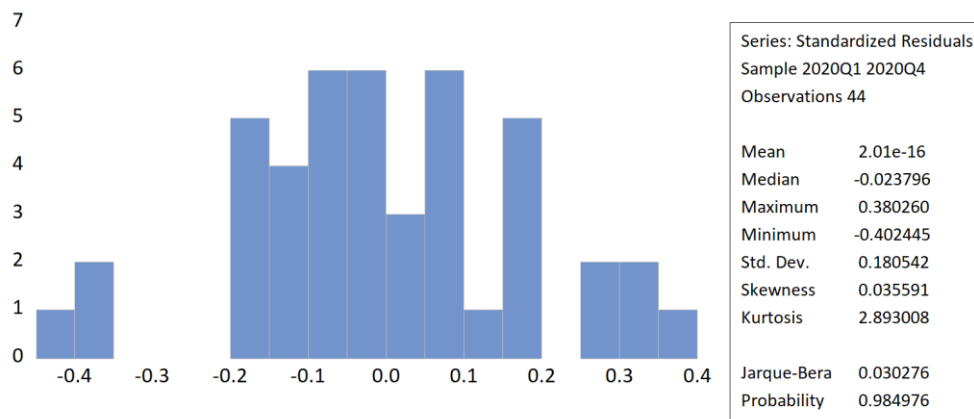
Weighted Statistics			
R-squared	0.509163	Mean dependent var	0.151101
Adjusted R-squared	0.472350	S.D. dependent var	0.107051
S.E. of regression	0.077762	Sum squared resid	0.241875
F-statistic	13.83113	Durbin-Watson stat	1.553243
Prob(F-statistic)	0.000002		

Unweighted Statistics			
R-squared	0.199195	Mean dependent var	0.532540
Sum squared resid	0.973981	Durbin-Watson stat	0.385727

Appendix 4.13: Results of Normality Test before COVID-19 Period



Appendix 4.14: Results of Normality Test during COVID-19 Period



Appendix 4.15: Results of Multicollinearity before COVID-19 Period

Variance Inflation Factors
Date: 01/15/22 Time: 16:15
Sample: 2019Q1 2019Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.269959	165.9864	NA
GDP	0.000775	10.07273	1.164599
CA	0.000125	22.90279	1.105910
BKLQ	3.20E-05	106.4504	1.057331

Appendix 4.16: Results of Multicollinearity during COVID-19 Period

Variance Inflation Factors
Date: 01/16/22 Time: 13:05
Sample: 2020Q1 2020Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.576069	330.2931	NA
LNLMORA	9.66E-06	2.141340	1.366686
GDP	1.50E-05	1.621572	1.351530
CA	0.000400	71.53976	1.016572
BKLQ	8.21E-05	259.1784	1.018812

Appendix 4.17: Results of Correlation before COVID-19 Period

Covariance Analysis: Ordinary
Date: 01/19/22 Time: 23:53
Sample: 2019Q1 2019Q4
Included observations: 44

Correlation Probability	ROA	GDP	CA	BKLQ
ROA	1	-0.222752	0.374436	-0.372255
GDP	-0.222752	1	-0.168409	-0.134227
CA	0.374436	-0.168409	1	-0.020914
BKLQ	-0.372255	-0.134227	-0.020914	1

Appendix 4.18: Results of Correlation during COVID-19 Period

Covariance Analysis: Ordinary
Date: 01/20/22 Time: 00:01
Sample: 2020Q1 2020Q4
Included observations: 44

Correlation Probability	ROA	GDP	CA	LN MORA	BKLQ
ROA	1	0.236863	0.175774	-0.030810	-0.146556
GDP	0.236863	1	0.013522	-0.471926	0.039585
CA	0.175774	0.013522	1	0.101718	0.081311
LN MORA	-0.030810	-0.471926	0.101718	1	0.037236
BKLQ	-0.146556	0.039585	0.081311	0.037236	1

Appendix 4.19: Results of Heteroscedasticity before COVID-19 Period

Residual Cross-Section Dependence Test
Null hypothesis: No cross-section dependence (correlation) in residuals
Equation: Untitled
Periods included: 4
Cross-sections included: 11
Total panel observations: 44
Note: non-zero cross-section means detected in data
Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	79.07971	55	0.0184
Pesaran scaled LM	2.295911		0.0217
Pesaran CD	-1.093552		0.2742

Appendix 4.20: Results of Heteroscedasticity during COVID-19 Period

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Equation: Untitled

Periods included: 4

Cross-sections included: 11

Total panel observations: 44

Note: non-zero cross-section means detected in data

Cross-section means were removed during computation of correlations

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	66.39049	55	0.1397
Pesaran scaled LM	1.086041		0.2775
Pesaran CD	0.588184		0.5564