GLCS' PERFORMANCE IN MALAYSIA: DOES CORRUPTION MATTERS?

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A final year project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF ECONOMICS (HONS) FINANCIAL ECONOMICS

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF ECONOMICS

MARCH 2021

DECLARATION

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(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

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ACKNOWLEDGMENT

We would like to extend our sincere gratitude and appreciation towards those who made it possible for us to complete this project. First and foremost, we would like to express our heartfelt gratitude to Dr. Vikniswari a/p Vija Kumaran for her patience and guidance throughout the completion of the project. She enlightened us regarding the core of our research and provided us with valuable advice and support which enabled us to overcome the hurdles we encountered in this project.

Besides, we are grateful for the clear and insightful comments and suggestions provided by our examiner, Mr. Chen Fan Yu. With his vast knowledge, he provided us with invaluable information and constructive feedback which aided us in the process of amending and improving our research. Moreover, we would like to thank our FYP coordinator, Mr. Thurai Murugan a/l Nathan for providing us with the FYP guidelines and requirements as well as keeping us posted on the submission deadlines.

Last but not least, our sincere gratitude goes out to our families and friends for their unfailing love and support and for being our source of strength and comfort. For those who supported us directly and indirectly along the way, we would like to thank you, for because of you, this project has come to fruition.

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LIST OF ABBREVIATIONS

1MDB	1 Malaysia Development Berhad
AB	Arellano-Bond
ADF	Augmented Dickey-Fuller test
APT	Arbitrage pricing theory
ASE	Amman Stock Exchange
ASEAN	Association of Southeast Asian Nations
BSE	Bombay Stock Exchange
CAPM	Capital asset pricing model
DF	Dickey-Fuller test
EPS	Earnings per share
FEM	Fixed effect model
FTSE	Financial Times Stock Exchange
GDP	Gross Domestic Product
GLCs	Government linked companies
GLICs	Government linked Investment companies
GLS	Generalized least squares
GMM	Generalized method of moments
IPS	Im, Pesaran and Shin Test
KLCI	Kuala Lumpur Composite Index
LLC	Levin-Lin-Chu Test
ML	Maximum likelihood
MVAIC	Modified value-added intellectual coefficient
MYX	Bursa Malaysia
OLS	Ordinary least squares

PN	Perikatan Nasional
POLS	Pooled ordinary least squares
REM	Random effect model
ROA	Return on assets
ROE	Return on equity
SMEs	Small and medium enterprises
SOEs	State-owned enterprises
VIF	Variance inflation factor

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PREFACE

Corruption involves the abuse of public power for personal motives. It is like an epidemic that has plagued our nation for quite some time and is prevalent in the dealings with government officials as well as among government authorities. Malaysia is notorious with many scandals involving bribery with one of the most prominent cases being the 1MDB scandal that has tarnished the reputation of the country. It is clear that close relationships and dealings are present between the government and government-linked companies (GLCs) as suggested by its name, thus corruption can occur through various channels to distort the playing field in order to further the goals of GLCs or to be used as an instrument for GLCs to conduct politically motivated activities.

Apart from that, there are various inherent and external factors that may influence the performance of GLCs in Malaysia. This research will examine the impacts of internal factors consisting of financial leverage and state ownership as well as external factors comprising of economic growth and corruption upon the performance of GLCs in Malaysia. This study will provide insights on the variables affecting GLCs' performance and be used as a guide for future researchers of the similar topic.

ABSTRACT

The primary aim of conducting this research is to determine the factors that influence the performance of GLCs in Malaysia, especially to shed light on the impacts of corruption towards GLCs' performance as it is commonly known that bribery is often times inevitable when it comes to the dealings with government authorities. This research is carried out using secondary data collected from 2013 to 2019, annually on 24 GLCs in Malaysia. Difference GMM estimation approach is utilised to evaluate the relationship between the independent variables and the dependent variable. The empirical test result showed that GDP, corruption and state ownership have significant impact on the performance of GLCs while financial leverage showed no significant influence on GLCs' performance in Malaysia. The limitations and recommendations of the study are provided to benefit future researchers as well as to those who will find results of this study useful.

CHAPTER 1: INTRODUCTION

1.0 Introduction

According to Said (2014), GLCs or, more generally, SOEs is a group of companies that are controlled by the Malaysian government through the Federal GLICs for example, Khazanah Nasional Berhad. Khazanah Nasional is an investment holding arm that is assigned a task to control and manage the activities of GLCs (Khazanah Nasional Berhad, n.d.). It was also defined as the companies that Malaysian government had a direct controlling stake with primary commercial goal. The controlling stake not only refers to the percentage ownership, but also the ability to appoint Board of Directors, senior management team, and make decision in corporate planning of the companies such as contract award, finance, business strategy, and investment either directly or indirectly via GLICs (Said, 2014). Moreover, GLCs play an important role to Malaysia's economy as 42% of market capital of MYX is controlled by GLCs, and they contributed at least 51% to the country's GDP as at the year 2015 (Azman, 2018). For the purpose of improving the efficiency and profitability of GLCs, the government had launched the GLC Transformation Programme in May 2004 (Putrajaya Committee, n.d.). This chapter will include the research background, problem statement, research question and objective, significance of study as well as the scope of study.

1.1 Research Background

1.1.1 Performance of GLCs

According to the International Finance Corporation, SOEs account for 20% of investment, 5% of employment and about 40% of output produced domestically in countries around the world. SOEs in advanced, emerging, and middle as well as low income countries have expanded and many SOEs are now ranked among the largest companies in the world. In the meantime, many SOEs are struggling, as in general, SOEs experience low productivity, they distort competition and face mismanagement and corruption (IMF, 2020). Hence, it is even more crucial for SOEs to elevate their performance, efficiency as well as reputation since a misstep in operations could bring forth negative impacts on the citizens, business and eventually the whole economy. Governments around the globe are looking into improving corporate governance of SOEs to ensure enhanced performance of SOEs.

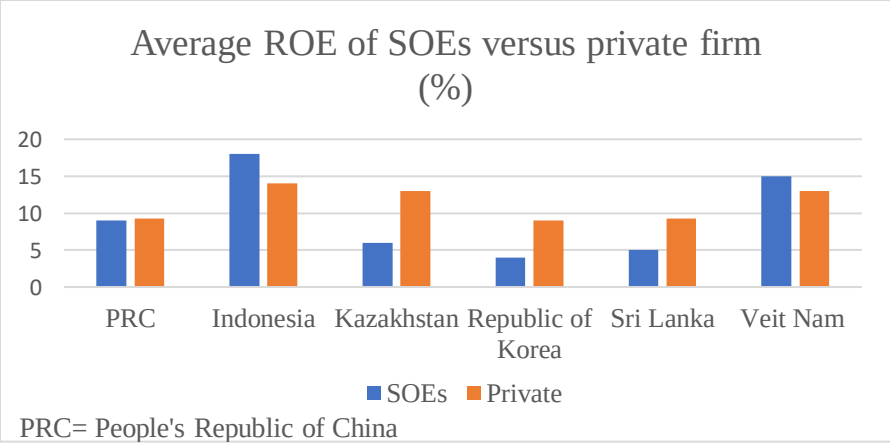


Figure 1.1. Average ROE of SOEs versus private firms, from 2010-2018. Adapted from Ginting, E. & Naqvi, K. (2020). Reforms, opportunities, and challenges for state-owned enterprises. *Asian Development Bank.*

Based on Figure 1.1, the average ROE, used in determining firm performance from 2010 to 2018 of SOEs are examined relative to private firms in different countries. The rate of return for private firms is generally higher than that of public firms. The ROE computed is significantly higher for private firms relative to SOEs for the case of the Republic of Korea where the ROE is 8.6% for private firms and 3.5% for SOEs. Such a trend is also observable in remaining Asian nations except for Indonesia and Vietnam as their ROE for public firms are comparatively higher than private firms. However, it is vital to take note that in the majority of the countries, SOEs are given tremendous assistance by the government in terms of credit access and subsidies which make the playing field unfair to private firms. Therefore, a superior ROE for SOEs may not reflect favourable performance but may be an outcome of privileges they received from the government (Ginting & Naqvi, 2020).

By looking at the performance of GLCs in Malaysia, it can be measured in several ways including the use of financial ratios such as ROA, ROE, Tobin's Q and so on. According to Isa and Lee (2016), the authors used all the three ratios as mentioned to determine the performance of GLCs versus non-GLCs in Malaysia whereby both univariate and multivariate analysis showed that GLCs that are listed in the GLC Transformation Program performed not as well as non-GLCs based on the performance measures. Regardless of their huge size and ability to obtain more resources as well as having the support and aid from the government, GLCs are underperforming relative to their non-GLC peers.

Based on the research pertaining to news article reports, we found that most of the stated GLCs are not performing well. For example, Telekom Malaysia announced its first quarterly net loss in 10 years amounting to RM175.6 million for the 3-month period ended September 30, 2018, reported by The Malaysian Reserve (Dashveenjit, 2018). Besides, Boustead Holdings Bhd suffered a net loss of RM153.1 million for the first nine months ended September 2019 as reported by

the New Straits Times.

Performance of GLCs can be influenced by various factors such as internal factors regarding the performance indicators within the firms like amount of non-performing loan, net interest margin as well as external factors, for example inflation and economic growth (Artha & Mulyana, 2018). For our study, we will be focusing on four variables that might impact the performance of GLCs in Malaysia, namely corruption, financial leverage, economic growth, and state ownership.

1.1.2 Rationale of Choosing the Variables

Profitability (Performance of GLCs)

Profitability can be considered as performance of GLCs, which will be the dependent variables in this study. Many studies mentioned that there are several ways to measure the profitability of firm such as ROA, ROE as well as Tobin's Q. Based on that, this research will use ROA as the measurement to indicate the GLCs performance. ROA is the indicator to describe how management team of company can fully utilize its assets to generate more earnings. ROE was not chosen as dependent variable is because ROE can be maintained through the fund of stock buybacks and growing debt leveraging, thus, it can be easily manipulated, hence it would potentially erode the performance of firms. While ROA can avoid the abovementioned issue, it also can quickly concentrate management's attention on the assets they have to run the business activities.

Economic growth

Economic growth is one of the determinants of firm performance, and it is commonly measured by GDP growth rate, a macroeconomic indicator employed to define the total market value of finished goods and services produced by business corporations within a particular country. Majority of studies mentioned that GDP can positively affect the firm's output even for GLCs. There is negative growth in GDP when economic recession happens in a country thus leading to sales revenue and profit decrease and manufacturers will tend to carry out cost reduction when hiring new staff or even cost cutting by firing existing employees. According to Boyle (2020), the financial crisis in 2007-2008 will increase the unemployment rate in different countries that are affected. While an increase in unemployment will adversely affect the income per capita. In addition, it also significantly reduces consumer purchasing power. In other words, the demand of products will be diminished ultimately due to lower consumer purchasing power followed by indirectly and adversely affecting the company's profitability. In this study, economic growth and GDP will be used interchangeably.

Financial Leverage

Financial leverage refers to a company using debts to finance additional assets, and it is one of independent variables to explain the relationship with firm performance. The problem with leverage occurs when GLCs are unable to raise enough capital through the issuance of shares in the market to meet the future development, thereby they might decide to finance their assets by taking on debt. When firms are holding debts, they are required to pay regular interest on debts. Since higher leverage represents the higher debt borne by firms, thus if they cannot generate sufficient earnings, it will diminish the firms' profitability. Therefore, liquidity risk will surface if the total amount of assets do not exceed the total amount of debts (Balasubramaniam, 2020). Ab Razak and Mahat (2013) also

stated that firms with lower loans will reduce liquidity risk and also enhance its profitability.

Basically, the financial leverage of each company can be measured as debt to equity ratio. The optimal debt to equity ratio depends on the level of industry, but in general rules, it should not exceed 2.0. Firm with high debt to equity ratio will result in lenders or investors bearing the higher risk causing them to lose confidence in the firm. Based on appendix 1.1, it shows the information about 24 GLCs' debt to equity ratio. Overall, it is clear that the majority of GLCs in Malaysia have optimal level of debt to equity ratio except MBSB (7.31). Hence, firms with lower leverage ratio have lower amount of debt, instead, they will raise the fund by increasing the issuance of shares either to public or government. In other words, those GLCs ownership might be owned by government, if most shares are possessed by either government institution or politician.

State Ownership

State ownership can be defined as government ownership, which is the equity ownership by government in a firm. According to Jennifer and Michael (2018), investors must be aware of those listed firms with strongly concentrated share ownership. Even though, concentrated ownership via shareholdings linked with the case of government controlled GLCs can effectively solve the agency problem for the purpose of implementing acquisition and bank financing, it might inefficiently reallocate the wealth benefit from other investors to themselves if there are changes in corporate governance due to changes in ownership which will further restructure corporate governance through providing ownership to government or foreign investors. In other words, increase in state ownership means that the rise in the institutional environment would enhance the firm's ability to get the benefit such as providing lower cost of capital for companies and benefitting its stakeholders.

However, one of the potential problems for firms with concentrated state ownership is that the government or politicians can control the company via substantial share ownership or negotiation with either politically connected directors or managers to distort investment efficiency, thus indirectly harming investors' return. Theoretically, highly concentrated ownership can boost corporate performance, but some of the empirical studies showed that concentrated ownership is a very common way for government to control GLCs and this will lead to lower performance of GLCs.

Appendix 1.2 represents the average percentage of GLCs' share ownership owned by the government from 2013 to 2019. We can observe that on average, the highest percentage of shares in GLCs owned by the government is TH Plantation Berhad as the government accounts for 80.42% of the total shareholdings in this company. In addition, the government owns more than a quarter of the shares for all the companies in our scope on average, for instance, Theta Edge Berhad (68.69%), Axiata Group Berhad (72.27%) and Pasdec Holdings Berhad (42.42%). In other words, we can assume that the corporate governance of those GLCs will be weak as many politicians are involved in the corporate management, and they might not have professional knowledge to contribute to the company's performance, thus further encumbering and delaying the company's development.

Corruption

Speaking of corruption, it is one of factor to determine the performance of firms, and it is identified as one of the vital barriers for improving social and economic development. It is defined as the violation of rules and misuse of public power for personal gain. Usually, the forms of corruption are like bribery, fraud, embezzlement which involve the misuse of public authority. For business development, corruption can negatively affect the firm's performance. It could

make it hard for a company to compete with competitors once corruption occurs, because the general public which includes company's loyal customers and business partners no longer trust the company and will have a negative perception towards the company (Lamarco, 2018).

Additionally, it is much more difficult to attract foreign investment because the company already has a weak reputation due to corruption. Furthermore, existing shareholders will lose confidence in the company's performance. Based on that, those existing investors would withdraw their funds from the company involved in corruption, hence the company would not have sufficient net cash to grow their business thus damaging the firm's financial performance. According to Satar (2020), the number of economic crimes which include corporate corruption has increased to 43% in 2020 as compared with 41% in 2018 based on PwC Malaysia's 2020 survey. Therefore, corruption among companies is considered a serious issue in Malaysia.

1.2 Problem Statement

Initially, considering the vital contribution and magnitude of GLCs during the implementation of the GLC Transformation Program, GLCs performed well during the time for their business expansion. According to Menon (2017), the market capitalization of the 24 largest GLCs (known as G-20) gradually boosted up from RM133.8 billion in 2004 to RM380.6 billion in 2015. However, up until at the end of 2015, the shareholder's return no longer performed as well as the market after the implementation of the program since those GLCs kept conducting divestment program in new sector by conducting acquisition in private sector finance and property developments. Furthermore, many studies showed that the gains made via divestment could be offset by the increased shares of GLCs in the Kuala Lumpur Composite Index (KLCI). Thus, the earnings per share would be diluted, and the existing shareholder's

return would also be shared by other people.

Besides that, the corporate governance of GLCs also caused doubts among the public, because one of the public concerns towards GLCs is the lack of transparency. Normally, the public will never know if the internal management structure of GLCs is good or bad. Since the performance of GLCs are controlled by the government, the citizens have to constantly pay attention to whether the decision made by GLCs is consistent with their benefits. Moreover, in Malaysia, citizens need to monitor GLICs as those investment companies such as Khazanah Nasional Bhd, manages the funds derived from the public and would distribute some of the public funds to GLC as investments. Thus, the performance of GLCs can determine whether the wealth of the nation will increase or not. Based on that, those GLCs need to be reformed and not follow the traditional business method to avoid negatively affecting the efficiency of the whole economy or becoming an obstacle to making Malaysia a high-income country.

On the other hand, there are some internal and external factor that can affect the firm's performance even is GLCs. Normally, such crisis like global financial crisis in 2007, it would deteriorate the consumption and export as people would consume less, and almost all the SMEs would be shut down during that period. Furthermore, Malaysia exports was decreased by 45% from 2008 to 2009. Hence, it will negatively impact the performance of firms that are in export-oriented business. As economic recession indicates negative economic growth, it represents the diminishing aggregate demand of service and goods in the country since majority of people are unemployed and have lower purchasing power. Eventually, it can affect the overall profitability of companies, decreasing their performance. Therefore, it is increasingly important for the firm's management team to come up with various solutions to mitigate the risk that companies are enduring and to improve corporate performance during recession period. Moreover, it is also motivate us to study whether the performance of firm will perform better in the future or not, when there was a negative economic growth during that period.

As GLCs have major equity ownership by the government, thus having government officials in their management team, hence able to obtain assistance and relevant business connections from the government. As a result, it would positively affect the performance of GLCs. However, according to Praksh (2020), Perikatan Nasional (PN) appointed its politician as some of the GLCs' board members and director would disrupt corporate performance since are now headed by politicians, it cannot bring benefit to the public especially when it is involved with financial misappropriation. Moreover, it is unfair to the experts in the GLCs because politicians are not capable of handling corporate and business issues. Based on that, there is a mixed result in determining whether firm performance will suffer under the leadership of government officials or not as it is based on the attitude of government officials.

Apart from that, some of the firms would raise its capital through leverage in order to meet future development, depending on the profitability of company. If companies have higher profitability, their performance will not be adversely impacted since they are capable of paying regular interest on debt. Otherwise, the accumulated debt will be detrimental to firms' performance. For instance, 1MDB financed the heavy debts of RM41.9 billion in 2015, later, there was a gap of RM27 billion between its liabilities and assets that appeared due to not being able to make enough earnings to cover back its debt. Therefore, its financial performance would be negatively affected, and might be facing risk of bankruptcy. Besides, financial crisis like Asian Financial Crisis of 1997-1998 could portray the relationship between firm performance and financial leverage as firms with high financial leverage would experience worse performance during financial crisis in terms of business operation. Hence, they would not have any free cash flow to pay the interest on debt to their creditors. Moreover, the possession of huge illiquid assets by firms would damage their ROA. Therefore, it is important for the management team of firm make proper decision regarding its capital structure as taking too much debt might lead to bankruptcy especially during the period of crisis.

Besides that, the implication of corruption on performance of firm may vary across different ownerships of firms. For private firms, it would be harmful for its

performance, but it would not disadvantageously impact the performance of GLCs. Since the effect of corruption is associated with government institution and politicians, thus it can be mutually beneficial to GLCs and the government. The government and politicians can protect GLCs from adverse effect of government impositions via extracting bribes from the companies. Additionally, those firms would also have a higher opportunity to benefit themselves via government, such as tax incentives as well as favourable regulations and policies to their own company. Unfortunately, once they are found corrupt, the adverse consequences would be damaging companies' brand and making it hard to attract the foreign investment. For instance, Najib Razak, who was the previous Prime Minister, was accused of straining RM2.7 billion from 1MDB into his individual bank account as 1MDB was owned by him. Consequently, due to GLCs weak performance, it would lead to decrease in public confidence for foreign investors to carry out investments. Therefore, the consequences of corruption would be a mixed result for firm performance especially GLCs. In other words, corruption plays different roles in different types of firms. For private firms, it will exacerbate the performance of firms whereas the performance of GLCs have positive relationship with corruption. Additionally, there is fewer journal to discuss and determine the impact of corruption on firm performance. Hence, it is crucial to identify the effect of corruption on GLCs in Malaysia.

1.3 Research Question

In this segment, there are two questions that indicate the outline for our paper:

i) What are the factors that will affect the performance of GLCs in Malaysia?

ii) Does corruption significantly affect the performance of GLCs Malaysia?

1.4 Research Objectives

This segment is to show the purpose of this paper which includes the general objective and specific objective.

1.4.1 General Objective

The purpose of this research paper is to study the performance for the 24 selected GLCs in Malaysia from 2013 to 2019. Simultaneously, this paper will study how corruption will significantly shape the companies' performance.

1.4.2 Specific Objective

This paper would be focusing on:

i. To identify the factors that affect the performance of GLCs in Malaysia.
ii. To investigate the effect of corruption on the performance of GLCs in Malaysia.

1.5 Significance of Study

This paper intends to find out the factors that affect the performance of GLCs in Malaysia. The purpose of evaluating the performance of GLCs in Malaysia is that there is a lack of research papers of GLCs in Malaysia. GLCs in Malaysia have a huge impact towards Malaysian stock market due to the large number of GLCs being listed in the Malaysian stock market. Malaysian stock in 2020 suffered from a bad performance as GLCs price controls for more than a third of the market capitalization of FTSE Bursa

Malaysia KLCI, their low performance is a major influence on market performance (Surendran, 2019). Hence, to investigate the performance, we considered some factors that might lead to weak performance for GLCs in Malaysia. 24 GLCs are being selected because the companies suffered losses either quarterly or yearly from 2013 to 2019. For the period, we used yearly data from 2013 to 2019 because of the data availability to conduct this research.

Methodology applied in this research benefits future researcher on choosing method and tool of relevant study. This research also beneficial to the methodology by applying on businesses industry. Our study is significant as we include corruption as our research gap since there is still less research and literature that are done on corruption in Malaysia especially on GLCs performance. For example, one of the few researches done in Malaysia is to identify the anti-corruption commitment through Malaysian Transparency Index and political connections on firm value of GLCs using multiple regression method (Devi, Ko & Subramaniam, 2019). Besides, a primary research was done to determine the factors affecting accountability of GLCs in Malaysia (Said, Jaafar and Atan, 2015). For our research we will use corruption indicator on a national level which is Corruption Perceptions Index in Malaysia and employ secondary data as well as GMM approach to conduct the research which is different from past studies conducted in Malaysia. Hence, the different approach utilized will produce results that can be beneficial to different parties.

Besides, this study will benefit to Malaysia's government, managers, and future researchers. Government able to gain insights on the factors that affect the performance of GLCs and thus enhance the policies on corruption by adopt some policies such as soft structuring policies and restructuring police. Besides, it also contributes knowledge for managers and future researchers. Managers able to implement strategies and controls to help improve the performance of the companies. Future researchers can benefit from theoretical and empirical research of this study.

1.6 Chapter Conclusion

Overall, this chapter introduced the background of GLCs in Malaysia's perspective. Besides, the problem statement is presented to highlight the main issues that will be further discussed in the study. Moreover, the research question and objective are provided to state the purpose of this study. Lastly, the significance of study is stated to show the contributions and area of study. In the next chapter, the theoretical and empirical reviews of the study will be covered.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter provides the factors that affect the performance of GLCs in Malaysia which are economic growth, financial leverage, state ownership, and corruption. Furthermore, this chapter will provide a clear understanding on the connection between independent variables and dependent variable as well as forming the theoretical framework for this research. Past literatures will be reviewed to examine the relationship between independent variables and dependent variables. Besides, the gap variable in the research will be determined in this chapter.

2.1 Theoretical Review

2.1.1 Agency theory

In the studies of Berle and Means (1932), they analysed the ownership structure of big firms in the U.S. and argued that it is possible for the agents to utilise the property of the company for their own benefits, thus creating principal-agent conflict as a result of the agents' interest is misaligned with that of the principal. The conflict between principal and agents can arise from the differing risk tolerance of both parties thus rendering divergent actions. Principals are willing to

pour in their capital and take on higher risk to anticipate higher returns while managers of the firms or agents are more risk averse and are more concerned on achieving their personal benefits, hence such contradicting risk preferences lead to agency conflict. Besides, Ross (1973) stated agency problem is a result of incentives problem while Mitnick (1975) regarded the problem as a result of institutional structure.

Apart from that Alchian and Demsetz (1972) and Jensen and Meckling (1976) described that company is a legal entity in which there are some contractual relationships that are present among individuals working in the company. Hence, agency relationship is considered as a contract between principal and manager but with both parties pursuing different interests thus causing agency cost which can be resolved through managerial ownership and control. A study found that as agents are decision makers in the firm who suggest and carry out the decision of the company but do not actually bear the consequences on the wealth effects of their decisions thus causing agency problem to surface in the management decision process (Fama & Jensen, 1983). The authors emphasized that it is vital to control agency problem to ensure the survival of the company.

Based on the framework of principal and agent, if managers have more equity ownership in the company, the firm will perform better as both the owner and managers will strive to excel the company's performance and less likely to divert resources since they will now have to bear the costs according to the portion of shareholdings. Hence, both parties will work towards maximizing the value of the firm as agency conflicts can be reduced with managers holding a portion of the shares.

As for the principal-principal framework, it is an agency problem that arises from the conflicting interests between large and minority shareholders. The framework suggests that the more equity is owned by the major shareholders, the better the company will perform as the alignment of interest between the major and minor

owners tends to be more consistent. Minor shareholders will gain benefits if the company's large shareholders are active and influential even though large owners may not be directly involved in the firm (Shleifer & Vishny, 1986). Moreover, the agency problem can be diminished since major shareholders possess better voting power thus able to control managers (Shleifer & Vishny, 1997).

Nonetheless, having major shareholders in the firm might also adversely impact the firm performance if their interest is unaligned with other equity holders. The presence of large shareholders may decrease agency problem but is unable to eliminate it since major shareholders might not be fully committed in monitoring the operations of the company as portions of their gains needed to be shared with minority shareholders (Hart, 1995). Besides, they might misuse their authority by diverting firm assets for example, persuading management to sell off assets to other firm that are under the supervision of the large shareholders at price lesser than market price. Overall, the performance of the firm depends on the alignment of interests between the owners and managers.

2.1.2 "Grease" versus "sand the wheels" hypothesis

Corruption can be a means to compensate different ill-functioning situations that take place in the bureaucracy. One of the various situations is that concerning slowness, especially the time sacrificed in queues. Bribery is a way to effectively increase the process of a slow-moving administration as it provides officials with incentives to speed up their tasks (Lui, 1985). Moreover, corruption can help managers to get over time-consuming bureaucratic regulations, thus enabling the company to grow faster for example, it was observed that in U.S. during the 1870's and 1880's corruption that took place in railroad, utility and industrial companies were able to performance better in terms of experiencing faster growth. Furthermore, if government officials do not possess adequate information or are not capable in making some decisions, graft may improve the selection of the right

decision which is commonly replicated by the result of a competitive auction (Beck & Maher, 1986; Lien, 1986). For instance, the government officials might choose to award license to companies based on their number of bribes, whereby the license will be given out to bribers that are more generous (Leff, 1964). Apart from that, bribery may be used as a hedge against unfavourable public policies (Leff, 1964; Bailey, 1966). Corruption can help prevent a firm from having to cope with inefficient regulations which may adversely impact the company's performance besides, it might also prompt amendment in the policy which might be beneficial to firms' growth. Therefore, under the hypothesis of "grease the wheels", graft would positively impact the firm performance and the economic activity given that there is low quality of governance (Méon & Sekkat, 2005).

As the "grease the wheels" hypothesis assumes the positive contributions of corruption towards development and growth resulting from its compensation towards inefficient administration and regulations, we could not rule out the fact that corruption might also impose extra costs thus reversing the positive effects. Hence, based on the hypothesis of "sand the wheels", graft is detrimental for growth as the governance quality worsens.

Graft can enhance the speed of administrative work since officials are incentivised to improve the process. However, civil servants may deliberately delay the process just to extract bribes (Myrdal, 1968). This is particularly true when the process requires many stages in which government officials of different stages possess some form of veto power, thus they might slow down the process of the project. The costs of bribing for the approval of a project can get higher when many government officials are involved instead of only one (Shleifer & Vishny, 1993). The rising number of transactions due to corruption may cause a trade off in benefits gained by firms in which they have to incur more cost and thus reduce their performance (Jain, 2001). Besides, corrupt officials are more incentivised to produce more inefficiencies in the economy to sustain their illegitimate income source (Kurer, 1993). While it is also questionable that graft will improve the

choice of right selections as higher bribes might not enhance efficiency. This is because if a firm obtains a license as a result of paying higher bribe, it may offset the cost by producing lower quality goods (Rose-Ackerman, 1997). Apart from that, corruption might cause the briber to bear higher risks as corruption is illegal, there will only be a weak commitment to adhere to the terms of contract, thus government officials might only accept the bribe and violate the agreement. This will cause the firm to suffer the losses of paying the cost for corruption without getting for instance the license it needs to carry on with its business, hence causing delay and negatively affecting the performance. Hence, graft increases the risks relating to a weak institutional environment instead of compensating it (Méon & Sekkat, 2005).

2.1.3 Static trade-off theory

Static trade-off theory can be suggested to each firms having their own unique and optimal capital structure that optimize the profitability of firms in balancing the cost of debt and financial distress and benefit of tax shield through debt financing (Culata and Gunarsih, 2012). This capital structure theory is developed by two economists, which are Modigliani and Miller in 1950s.

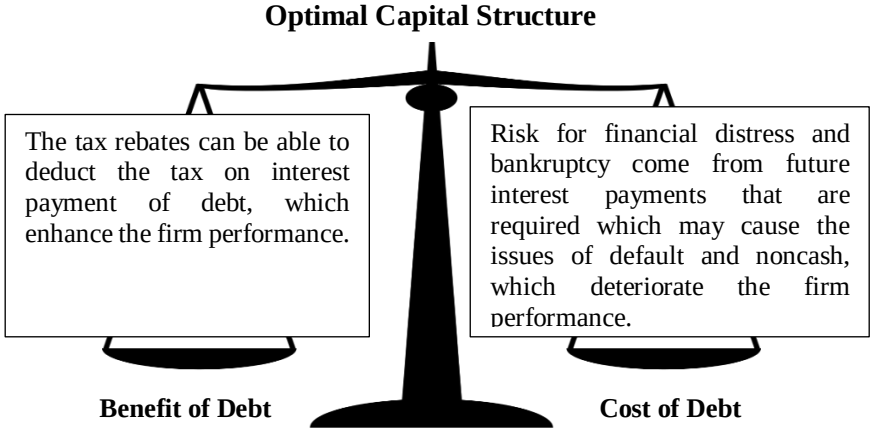


Figure 2.1. Static trade-off theory. Adapt from Hassan, L.; Samour, S. (2016). *Capital Structure and Firm Performance: Did the Financial Crisis Matter?*

As shown in Figure 2.1, the optimal capital structure of firm is balanced between the benefit and cost of debt via leveraging under static trade-off theory. According to static trade-off theory, the presence of tax rebate and risk of bankruptcy are under the condition of imperfect market, and it could impact the value of firm. Moreover, one of the assumptions is when firm increases the debt financing, it will increase the cost of bankruptcy due to rising leverage ratio will require debt holders to pay more interest rates, on the contrary, the firm also can benefit from tax deduction which can slightly improve the profitability of firm. Based on that, the shareholders will assume this scenario as the higher return for their investments. This is because the tax shields can help the firm to decrease the liabilities of firm's income tax and enhance the firm's after-tax profit. Theoretically, the situation of firm reaching the optimal debt to equity ratio is when the additional benefit related to tax rebate due to debt financing is exactly offset by the marginal cost of bankruptcy (Adair & Adaskou, 2014).

Therefore, the management team of firm should try to choose optimal debt to equity ratio that maximize the performance of firm. Besides that, this theory also predicts that there are higher chances for huge and profitable firms to have high optimal level of debt for maximizing the potential benefit of deductible tax income as well as increasing the availability of capital from leverage, at the same time, it will ensure the firms have lower probability of bankruptcy. Consequently, there might be chances of over-investment for firms that have optimal debt to equity ratio under the assumption of static trade-off theory. Based on that, financial leverage is expected to positively influence the firm performance (Andersson & Minnema, 2018).

2.1.4 Multifactor arbitrage pricing theory

The arbitrage pricing theory (APT) was proposed by Stephen Ross, an economist in 1967, which is used as an alternative to the capital asset pricing model (CAPM). APT is known as multi-factor asset pricing model since it focused on the notion that the expected return of an asset is able to be forecasted through a linear association between the expected return of the asset and a collection of macroeconomic factors that are able to encapsulate the non-diversifiable risk. APT serves as a valuable approach for analysing portfolios in the perspective of value investing as to enable investors to identify stocks that may be mispriced temporarily through determining the theoretical fair market value pertaining to an asset in order to allow opportunity to achieve short-term profit (Hayes, 2020). Besides that, under the assumption of APT, the capital markets are to be perfectly competitive and that the behaviour of investors does not have an impact on assets price without additional transaction cost. In addition, investors prefer to earn more returns rather than less returns, which means that they will try to select the combination of assets with minimum risk and optimal expected rate of return (Reinganum, M. R., 1981).

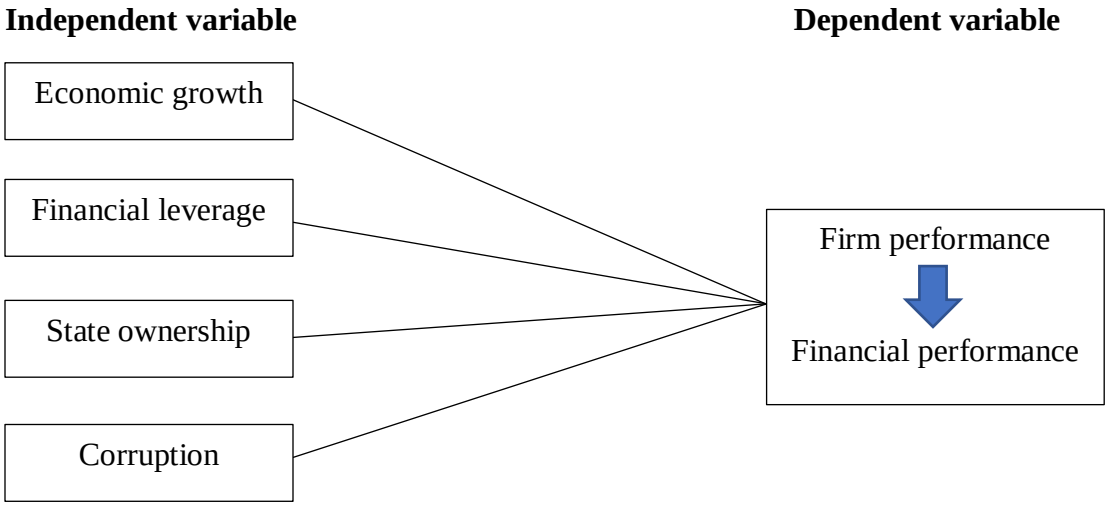
Besides that, APT can be used to analyse how stock price affected by macroeconomic factors. Usually, the stock price of that particular company implies that how well the real business activities they did during that period. In other words, it also indicates the change in production value added of that company. Several studies also applied the theory to take into account the macroeconomic factors that may impact the profitability of financial companies. Hence the APT model enables the authors to analyse macroeconomic factors in which the author included as unemployment rate, exchange rate, GDP growth rate, inflation rate and interest rate. One of authors used the GDP growth rate to explain the relationship with company’s stock price to determine the performance of company. When GDP growth rate rises, it assumes that the profitability of firm increase, thus the stock price will be boosted up (Elshqirat, 2019). This is because

the positive consequence of economic growth on the firm performance, which indirectly cause the firm to give more dividends and eventually will elevate the stock price. Based on that, there will be positive relationship between firm performance reflected by the stock price and GDP growth.

2.2 Framework

Figure 2.2 shows the research framework of the study in which the theoretical framework discussed in the previous section is incorporated to lay down the theoretical foundations for the relationship among the variables.

Figure 2.2: Research Framework



2.3 Empirical Review

2.3.1 Economic growth and Performance of GLCs

Several researchers debated the effects of GDP on firm performance, for instance, Ramli, Latan and Solovida (2018), examined the determinants of capital structure and firm financial performance from 1990 to 2010 in Malaysia and Indonesia where the effects of GDP to firm performance are tested. The method used is the partial least-structural equation model (PLS-SEM). This result showed that economic growth significantly and positively affected firm performance. This is supported by Tanaka, Bloom, David and Koga (2018) where the study examines public listed companies' performance of Japan and macro forecast accuracy for 25 years. Subsequently, the research found that GDP has positively affected the firms' performance, employment and output. Furthermore, according to Egbunike and Okerekeoti (2018), the study examined the relationship between macroeconomic factors towards firms' performance. The study focused on 21 manufacturing companies in Nigeria from 2011 to 2017 and used multiple linear regression methods. The result showed that GDP is positively and significantly related to ROA. Furthermore, evidence from China also showed a positive relationship by using MVAIC model and 953 companies from China Stock Market Accounting Research (Xu & Li, 2020). Moreover, a study from Indonesia examined the impact of GDP and Indonesian banks' ROA also showed a positive significant relationship but weaker correlation than expected. The author used multiple regression analysis to examine the Property & Real Estate Sector listed on Indonesian Stock Exchange (Romus, Anita, Abdillah and Zakaria, 2020). The author stated that such correlation is due to GDP increasing the customers' buying power and bringing profitability to companies as demand increased.

Besides, Ishak, Nasir, Ismail, and Hashim (2017) examined the effects of financial

ratio and GDP towards company performance in Malaysia by using the least square methods and regression model from 2001 to 2015 where 10 companies are selected. The result showed that GDP insignificantly affects the company performance whereas the financial ratio significantly affects the company performance. Authors suggested including more variables such as size of company to see the effects. This is supported by Adlina (2015) where the research found an insignificant relationship of GDP and firm profitability in Malaysia. The research studied the relationship between GDP and 161 firms' profitability in Malaysia from 2001 to 2012 by using the OLS method. The author mentioned that GDP affected the companies' profitability but did not significantly affect companies in Malaysia. Moreover, Doan (2019) researched financing decisions and 102 companies performance in Vietnam by using the GMM model. The result showed no significant correlation between economic growth and firm performance (ROA).

2.3.2 Financial Leverage and Performance of GLCs

Firm Financial leverage indicates the financing by firm for business expansion such as purchasing new assets, improving their production and operational process. It also can be considered as a proportion of debt in the capital structure, which is normally used for measurement of financial risk. According to Ibhagui and Olokoyo (2018), financial leverage has a negative impact on the firms' performance. When the firm keeps increasing its financial leverage, and its performance such as revenue reaches the equilibrium, this will cause the firm performance to begin decreasing. The authors used a benchmark threshold regression model to examine the relationship between financial leverage and Nigerian non-financial firms' performance from 2003 to 2007. Additionally, Iqbal and Usman (2018) also found that negative relationship is present between firm performance and financial leverage because high rates of leverage can reduce the firm's profitability. They targeted all the listed companies in Pakistan from 2011 to 2015 and used OLS method to examine the relationship between firm

profitability and financial leverage.

Moreover, the abovementioned statement is supported by Isa and Lee (2016). In terms of using debts, it showed that leverage ratio of GLCs is higher than non-GLCs. Thus, they run the multiple regression and combine the data from 2008 to 2013 for Malaysian GLCs and non-GLCs separately by using the t-statistic to make comparisons. In addition, Bui (2020) found that ineffective use of debt has a negative impact on Vietnamese firm performance. In the study, the author used 4 years data for 30 listed construction firms and adopted REM, FEM, POLS, and GMM model to analyse the relationship between leverage and firm performance. Besides, Abu-Abbas, Alhmoud, and Algazo (2019) also found similar finding in which financial leverage negatively influence firm performance proxied by ROA and EVA. The study was conducted using 56 manufacturing companies listed in ASE from 2011 to 2014 and applied into GLS model.

On the other hand, another study also investigated that the relationship between firm's ROA and financial leverage is positive as they further explained that raising capital via debt can be profitable for those firms to carry out future business development. In order to examine whether the ROA is correlated with financial leverage, they ran the random effect model through panel data analysis to test the performance of firms listed in Pakistan Stock Exchange KSE 100 by using from 2005 to 2014 (Ahmed, Awais and Kashif, 2018). Additionally, Dey, Hossain and Rahman (2018) also found that there is a significant positive relationship between the ratio of total debt to assets and the firm's financial performance measured by ROE. Based on their research regarding China's industrial state-owned companies, high liability ratio could force companies to do great external supervision with positive impacts on profits. Hence, they decided to choose China's industrial state-owned companies in manufacturing sectors in Bangladesh as their research study, and the study period is from 2001 to 2017.

Besides that, according to Hongli, Ajorsu, and Bakpa (2019), a study using ROA

and ROE as proxies for firm performance to analyse the effect of financial leverage on firm performance for companies listed on Ghana Stock Exchange from 2007 to 2015 revealed that leverage has a strong positive impact toward ROA and ROE. Although debt financing will result in declining performance, yet the effective use will promote growth and performance. This positive statement is also supported by Tripathy, and Shaik (2020), who researched 56 food processing firms listed on BSE from 2000 to 2018 through fixed effect, random effect and POLS model to support the positive significant relationship between financial leverage and firm financial performance.

2.3.3 State ownership and Performance of GLCs

A lot of studies had been conducted to examine the relationship between state ownership and the performance of companies. According to Eforis (2018), percentage of state ownership has a positive impact on firms' performance measured in ROA. The empirical study on SOEs in Indonesia from 2011 to 2015 showed that SOEs consisting of higher government ownership can perform better. The author cited the reason for this positive influence is because the Indonesian government is working towards building synergy among SOEs by optimising the resources and skills in SOEs, besides the cost of capital for SOEs are relatively lower than the private sector. A study focusing on the state ownership of emerging market enterprises in China by Yi, Hong, Hsu and Wang (2017) also deduced a positive relationship between state ownership measured by the share of state-owned assets to total assets and innovation performance measured by new product sales share to total sales. Besides that, this positive relationship can be supported by research done in Vietnam stating that government ownership positively influences the ROA and ROE of non-financial firms from 2007 to 2015 by adopting the dynamic models of panel data (Nguyen, Vo, Phung & Le, 2019). The findings by the authors also showed that an increase in the institutional environment of the province would heighten the firms' ability to profit. In addition,

state-owned firms have more access to insider information and capability to have control on policies and regulations as well as attracting talented employees via higher salaries and incentives (Kubo and Huu, 2019). Zulaikah, Larasati and Harymawan (2019) researched on Indonesian companies in the banking industry from 2014 to 2016 using OLS regression, stating that the government being the majority shareholder possesses the power to influence the behaviour of management. Besides, companies with high state ownership together with high disclosure on human resources perform better.

On the contrary, according to Khan, Khidmat, Hares, Muhammad and Saleem (2020), a study on Chinese listed firms from 2008 to 2016 conducted using the fixed effect model and GMM approach supports the negative relationship between state ownership and firm performance. The authors stated that the firm value is negatively affected since the agency cost of state-owned firms are higher, besides they are politically motivated, thus put less emphasis on performance. Furthermore, a study by Ting, Kweh, Lean and Ng (2016) on Malaysian public listed firms from 2002 to 2011 supports the negative impact on firm performance measured by Tobin's Q and ROA as government involvement may cause the activities of firms to be politically driven thus avoiding profit maximization.

Apart from that, according to Chen, Chen and Wei (2017), their study on state ownership for six listed Chinese airlines from 1994 to 2011 revealed a negative relationship between state ownership and the airline performance towards a certain extent where beyond the turning point, the performance is enhanced as stake held by the government increases. The findings shed light on the performance of mixed ownership, meaning that partially privatised airlines being the worst compared to those companies with strong privatization or concentrated government ownership. However, when examining publicly listed companies in China using an unbalanced data set from 2001 to 2011, Cheng and Ng (2018) observed a non-linear, concave relationship between government ownership and firms' financial performance represented by stock returns and Tobin's Q. Hence, there is a positive

relationship initially but beyond the inflection point, the relationship between the two variables becomes negative. The authors' findings conclude that SOEs that are highly privatized and severely controlled by state portrayed unfavourable performance than firms of mixed ownership. Similarly, Hooy, Hooy and Chee (2019) found a non-linear relationship between ultimate ownership and firm performance in Malaysia from 2001 to 2012. The authors stated that the initial positive relationship portrayed during lower ownership levels might be due to the higher chances of having other huge shareholders in the companies hence government ownership might be a monitoring tool to reduce agency and asymmetric information problems, thus improving firm performance. However, higher levels of ownership might adversely affect firm performance since they have more influence on extracting private gains and to convince management to work towards their own interests.

Moreover, Abdulsamad and Yusoff (2016) found that there is no significant relationship between ownership structure and the performance of listed firms measured by ROA and EPS in Malaysia from 2003 to 2013 for most of the years studied except for a weak significant positive relationship found in 2008 between state ownership and EPS.

2.3.4 Corruption and Performance of GLCs (Researched Gap)

There are many studies carried out to determine the relationship between performance of GLCs and GDP, financial leverage, and state ownership. Nevertheless, the study of corruption on GLC's performance is limited since corruption can be a sensitive topic in certain countries especially in ASEAN countries, hence there will be less journals to discuss it. Therefore, our gap variable for our research is corruption as its available information is quite limited and that it can also affect the overall performance of GLCs. Corruption is a normal phenomenon at macro and micro level. It not only occurs at the national level, but

also at the industrial level. Neither for developed nor developing countries, corruption is a complex issue faced by countries. A study used 147 economies and categorized them into 4 categories to conduct the research and concluded that corruption has increased the firm's performance in low-income countries while it has decreased the sales and export for the firm in middle and high income countries (Imran, Rehman and Khan, 2019).

Moreover, another group of researchers have conducted a study to discuss the impact of corruption in host countries on the performance of 150 subsidiaries of Indian multinationals of 13 yearly data by investigating the corruption perception index and its foreign direct investment. The authors concluded that the corruption in host countries has significantly increased the firm performance in the resource-based sector (Das and Mahalik, 2020). This finding is also supported by another study stating that political corruption has positively affected the firm's productivity. This is because the firm can use political connections to expand market share and get easy access to credit resources. Thus, greater political corruption may help the firm to eliminate competitors and improve the firm performance (Ashyrov and Akuffo, 2020). In addition, Wang, Yao, and Kang (2019) also found a positive relationship between political connection with the firm performance in China from 2004 to 2014 by observing government officials' site visits rate and the firm's ROA, ROE, and factor of productivity. The result showed that higher political connection has benefited the firm performance by enabling easier access to investment projects and bank loans.

On the other hand, another group of researchers conducted a study to investigate the impact of corruption towards newly established firms in Vietnam from 2011 to 2015. The result revealed that corruption has harmful impact on performance and sustainability of private domestic firms, while there is an insignificant impact toward GLCs. In addition, the authors also stated that only the more mature firms can better deal with corruption and take advantage on enhancing its performance (Nam, Nguyen, Nguyen, and Luu, 2020).

From the literature review, although we found that there is study using corruption perception index as the proxy of corruption, yet the data its use is based on Indian firm (Das and Mahalik, 2020). Additionally, although others study also analyse the relationship between corruption and firm performance, but the proxy their use are not same as in this study (Wang, Yao, and Kang, 2019; Das and Mahalik, 2020). In short, there is not any studies to investigate the direct effect of corruption on the performance of GLCs in Malaysia. Considering the participation and contribution of GLCs toward Malaysian market, we take this opportunity to fill this gap in this study.

2.4 Chapter Conclusion

In this chapter, we lay out the theoretical framework for the study and plot out the theoretical framework which gives a visual picture on the independent variables and the dependent variable. Next, relevant literature based on the variables studied are being reviewed and the research gap is also identified in this chapter.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In Chapter 3, we will discuss the methodology framework that will be applied in this research. The purpose of showing methodology is to lay out the methods that will be used to identify the relationship between the performance of GLCs in Malaysia with GDP, financial leverage, state ownership and corruption. Thus, this chapter will further introduce the research design, sources of data, basic and extension model, diagnostic testing and model estimation.

3.1 Research Design

This study mainly concentrates on quantitative research to answer the research questions as well as to accomplish the research objectives. In addition, this study conducts Difference Generalized Method of Moments (GMM) with panel dataset to identify the impact the factor that affect the GLCs' performance and also to investigate the impact of corruption on the performance of GLCs in Malaysia. Furthermore, we will use quantitative research to investigate the relationship between dependent variable and independent variables. Therefore, panel data analysis will be implemented in *Eviews 11 software* to run the model as well as execute the test to determine whether the independent variables will significantly affect the dependent variable.

3.2 Sources of Data

Due to limited resources, it is impossible for us to conduct the research for all GLCs in Malaysia, because some GLCs were out of the Bursa Malaysia as well as every GLCs' financial reporting period were not necessarily ending on every December. Moreover, the data for both variables are also restricted to certain years and unavailable for some GLCs. Eventually, we will use secondary data that constitutes an unbalanced panel dataset of 24 GLCs in Malaysia that met the requirement of our study which covers the period from 2013 to 2019, a total of seven years. Furthermore, all the variables are presented in logarithm form.

On the other hand, the dependent variable and each independent variable have its own proxy. GLCs performances are measured by ROA; GDP is measured by the growth rate of GDP; Financial Leverage is represented by debt to equity ratio; State ownership is proxied by the percentage of shares owned by government; Corruption is represented by the corruption perception index for Malaysia. A tabular presentation of the data and variables are shown below.

Table 3.1: Description of data and variables

Variables	Proxies	Expected sign	Sources
Dependent variables			
GLCs performance	Return on assets	-	Annual report
Independent variables			
Economic growth	Growth rate of GDP	Positive	World Bank Group
Financial leverage	Debt to equity ratio	Positive	Annual report
State ownership	Percentage of shares owned by government	Negative	Annual report
Corruption	Corruption Perception Index (CPI)	Positive	Transparency International

Remark: all the time period of resources is from 2013 to 2019 yearly.

3.3 Data Description

The panel dataset used in this research will be implemented in the following chapter. The datasets regarding all of the exogenous variables would be used to perform Difference GMM data analysis in order to identify the impact of factors that affect the

GLCs' performance and also to investigate the impact of corruption on the performance of GLCs in Malaysia.

3.3.1 Dependent Variables

GLCs Performance in Malaysia

The proxy for GLCs performance is ROA. It reflects how far the GLCs' ROA in Malaysia are affected by other exogenous variables and is indicated in our research as $\mathbf{ROA_{it}}$. ROA can determine how firm management to use its resources effectively such as assets for generating income. Samiloglu, Oztop, and Kahraman (2017), derived ROA from annual financial statements of GLCs on annual report. It is referred to net incomes divided by total assets for each GLCs.

3.3.2 Independent Variables

Economic growth

The proxy for economic growth is the growth rate of GDP and is indicated as $\mathbf{GDP_t}$. GDP includes all final goods and services that are produced by the local economic producers located in the country regardless of their ownership. In addition, it also can be a means to describe how well the country is, based on consumption, investment and government spending. According to Ishak, Nasir, Ismail and Hashim (2017), they stated that GDP is one of the important variables in predicting financial distressed companies and evaluating the stability of company performance. Hence, stable company usually will result in less liability

and more assets followed by generating more cash in the company.

Financial Leverage

To enhance the higher market value and returns of firm, those firms would opt for leverage. Based on Javed, Rao, Akram & Nazir (2015), they stated that the firm performance can offer investment provision arising from debt and equity. Therefore, the proxy for each GLCs financial leverage is debt to equity ratio and is indicated as $\mathbf{FINLEV_{it}}$. It is measured by the percentage ratio of debt to equity, which is total liabilities divided by total shareholder's equity, obtained from annual report of GLCs listed on Bursa Malaysia, and all the measurements are denominated in Malaysian Ringgit (RM).

State Ownership

State ownership is explained as corporation that is owned and controlled by government. Its proxy is the percentage of shares owned by government for each GLCs in Malaysia and will be indicated in our research as $\mathbf{SO_{it}}$. According to Najid and Rahman (2011), the authors derived the percentage of state ownership from among the top 30 shareholders listed in annual reports. Hence, for our research, the percentage of state ownership is also obtained from annual reports under the substantial shareholders and the list of top 30 shareholders.

Corruption

The proxy for corruption is the corruption perception index in Malaysia and is indicated as $\boldsymbol{CRRPT_{it}}$. It represents the extent of corruption perception and institutional quality for Malaysia. The corruption perceptions index is obtained from Transparency International. Cuervo-Cazurra (2008) also retrieved data on corruption through Transparency International to study the relationship of

corruption on foreign direct investment. Although corruption perceptions index is used at a national level, it can still be applied in our case since corruption is common among government officials, and as the government has close dealings with GLCs. According to Transparency International Malaysia (2020), after the 1MDB case surfaced, the corruption perceptions index of Malaysia started to fall from year 2014 at 52 to year 2017 at 47 (Mohan, 2020). Hence, it is clear that corruption happening in GLC can affect the corruption perceptions index of a nation.

3.4 Empirical Model Specification

As we have collected a panel dataset, thus we will conduct a panel data regression to run the basic model and extension model in order to identify the impact of factor that affect GLCs' performance and to investigate the impact of corruption on the performance of GLCs in Malaysia.

3.4.1 Basic Model

The model is adapted from Imran, S. M., Ur Rehman, H., and Khan, R. E. A. (2019) and is stated as below:

$$ROA_{it} = \beta_0 + \beta_1 Corruption_{it} + \varepsilon_{it}$$

where,

i represents the 24 GLCs in Malaysia we chose as mentioned above. While **t** represents the time period from 2013 to 2019

Corruption$_{it}$ represents the corruption perception index in Malaysia

ε_{it} represents the error term in which some of the omitted variables are ignored

3.4.2 Extension Model

- The functional model is stated below as

Log ROA= f(GDP, LEV, SO,CRRPT)

where, the additional explanatory variables involved in the model are GDP, financial leverage, state ownership and corruption.

- The econometric model *in Logarithm Form* is described below as

$$\ln ROA_{it} = \beta 0 + \beta 1 \ln GDP_{it} + \beta 2 \ln LEV_{it} + \beta 3 \ln SO_{it} + \beta 4 \ln CRRPT_{it} + \varepsilon it$$

where,
i represents the 24 GLCs in Malaysia we chose as mentioned above. While **t** represents the time period from 2013 to 2019
lnROAit represents the natural logarithm form of return made on assets (ROA) that is used as proxy for GLCs performance
lnGDPit represents the natural logarithm form of growth rate of GDP that is used as a proxy for economic growth.
lnLEVit represents the natural logarithm form of debt to equity ratio, is the proxy for financial leverage
lnSOit represents the natural logarithm form of state ownership used to demonstrate the percentage of shares owned by government
lnCRRPTit represents the natural logarithm form of corruption perception index in Malaysia, and it is the proxy for Malaysia's corruption.
εit represents the error term in which some of the omitted variables are ignored

3.5 Econometric Framework

3.5.1 Difference Generalized Method of Moments (GMM)

Lars Hansen (1982) is the one that introduced GMM into econometrics. GMM is a method used to estimate the parameter in a statistical model where distribution of data does not apply the likelihood function. GMM is considered asymptotically normally distributed, consistent and efficient. The model defines a finite range of number of moment restrictions and fixed number of time periods. Thus, a GMM estimator that is asymptotically normal distributed can be easily obtainable. There are some assumptions and requirements needed to be considered before using GMM estimation in which the number of moment conditions need to be specified prior to using GMM approach. Besides, the time period must be small and the number of moment restrictions must be large. Furthermore, the regressor is a dynamic data. For regressand, they do not necessarily have to be exogenous variables. Moreover, there is possibility of heteroscedasticity and autocorrelation among other variables.

Arellano & Bond (1991) introduced the difference GMM where this model will be considered as our model estimation since difference GMM makes predictions about particular random variable moments rather than predictions about the whole range, making it more stable than ML. As difference GMM takes into consideration heteroscedasticity, autocorrelation and endogenous problems, it is commonly used to examine the firm performance based on past research. The advantages of using difference GMM is that it allows for a partial adjustment mechanism by using the first differentiation where the lagged of the regressand is one of the regressors and helps to record the dynamic relationship. In short, it can prevent the correlation between regressand and regressors (Baum, 2013).

3.6 Diagnostic Checking

3.6.1 Panel Unit Root Tests

Before conducting co-integration test in this study, it is necessary to test for stationarity in a time series data for whole set of variables by using unit root test. The purpose of conducting panel unit root test is to assess whether the series data of the model is stationary or having a unit root. In addition, applying the unit root test is crucial to avert biased estimation that will lead to meaningless results in co-integration test. The power of panel unit root test is significantly greater than a standard time series unit root (UKEssays, 2018). Moreover, according to Kunst, Nell and Zimmermann (2011), the main difference of panel unit root tests and time series unit root tests is the asymptotic behaviour between the cross-sectional dimension (N) and the time-series dimension (T) need to be considered when using panel unit root tests. There are 5 types of panel unit root tests namely Levin-Lin-Chu Test (LLC), Im, Pesaran and Shin Test (IPS), Breitung's Test, Fisher-type Test (Fisher-ADF test and Fisher-PP test), and Hadri test. However, in this study, 3 of the 5 tests which are LLC, IPS and ADF tests will be performed in this study to test the stationary of the data (Kunst, Nell and Zimmermann, 2011).

Augmented Dickey-Fuller test (ADF)

ADF is a common statistic test used to analyze stationarity of the series of data. By referring to it name, ADF is an 'augmented' version of the Dickey Fuller test (DF test). It will expand the DF test equation to include high order regressive process in the model (Barbieri, 2005).

$$y_t = c + \beta t + \alpha y_{t-1} + \theta_1 \Delta y_{t-1} + \theta_2 \Delta y_{t-2} \ldots + \theta_p \Delta y_{p-1} + e_t$$

ADF test suggest following hypothesis to test unit root:

$H_0: \theta = 0$ (Unit root)

$H_1: \theta < 0$ (Stationary)

Levin-Lin-Chu test (LLC)

Levin, Lin and Chu (2002) found that the first generation of unit root test such as DF and ADF test have limited power over the alternative hypotheses with highly consistent bias from the equilibrium, this issue occurs commonly in small sample size. Therefore, they generated a more powerful panel unit root test to measure the pooled first-order autoregressive parameter. The LLC is an extension of ADF test, and is based on a ADF regression model as follows:

$$\Delta y_{it} = \alpha_{it-1} + \beta_{0i} + \beta_{1it} + \varepsilon_{it}$$

Where i = 1,2,3,…,N and t = 1,2,3,…,T

LLC test suggest following hypothesis to test unit root:

H_0: There is unit root in each time series (Non stationary)

H_1: There is not unit root in each time series (Stationary)

According to the model, both individual effect (β_{0i}) and time trend (β_{1it}) are incorporated. The heterogeneity in the deterministic components can be enhanced by the lagged dependent variable and restricted to be homogeneous across every units of data. The error term (ε_{it}) is assumed to be distributed independently across individual, and follow stationary autoregressive moving-average process (ARMA) for each individual at:

$$\varepsilon_{it} = \sum_{i=1}^{\infty} \theta_{ij} \varepsilon_{it-j} + \varepsilon$$

According to the study, LLC will perform well under two conditions which are when N (panel of observation) lies between 10 and 250, and when T (time series observation) lies between 5 and 250. LLC will become undersized and ineffective if T is very small.

Im, Pesaran and Shin Test (IPS)

Similar with LLC, IPS is also an alternative testing procedure that is based on the ADF test, which uses a standardize t-bar test statistic (UKEssays, 2018). IPS is a powerful unit root test that is able to combine the information from time series data and cross-sectional dimension. Additionally, fewer time observation is required for this test to be powerful (Im, Pesaran and Shin, 2003). IPS started with specifying a linear trend for each of the cross-section with individual effects and without time trend:

$$\Delta y_{it} = \alpha_{i-1} + \rho_i y_{it-1} + \sum_{j=1}^{\rho_i} \beta_{ij} \Delta y_{it-j} + \varepsilon_{it}$$

Where i = 1, 2, 3…, N and t = 1, 2, 3…, T

IPS test suggest following hypothesis to test unit root:

$H_0: \beta_{ij} = 0$ (Unit root)

$H_1: \beta_{ij} < 0$ (Stationary)

3.6.2 Multicollinearity

Multicollinearity refers to the degree of correlation present between the explanatory or independent variables of a regression model. If there is high collinearity between the independent variables, we will not be able to identify the individual effect of the independent variable towards the dependent variable, this will cause the estimates to be unreliable. According to Gujarati (2003), there are a few rules of thumb that could be applied to detect the degree of multicollinearity, one of them is the high pair-wise correlations among the explanatory variables. Multicollinearity is said to be a serious issue if the pair-wise correlation coefficient between two independent variables is high, in which the coefficient exceeds 0.8. Hence, it is important to detect the strength of correlation, and ensure that it is below 0.8 in order to avoid unreliable statistical estimates.

Apart from that, variance inflation factor (VIF) can be employed to detect multicollinearity. According to Gujarati and Porter (2009), if collinearity is absent between two independent variables, the VIF will be one as can be seen from the formula below:

$$VIF = \frac{1}{(1 - r_{ij}^2)}$$

However, there is perfect collinearity when r_{ij}^2 equals to one as the VIF will be infinite. It means that as the degree of collinearity between two regressors rises, the estimator's variance would increase to infinity. Hence, the rule of thumb for VIF is that once the r_{ij}^2 goes beyond 0.9, the VIF will surpass 10, thus indicating that there is high collinearity.

3.6.3 Sargan-Hansen test

The Sargan-Hansen test, also known as the J-statistics of Hansen was proposed by Sargan (1958) and Hansen (1982) as an essential statistical test for over-identifying restrictions and to identify the validity of the instrumental variables. It is the most commonly used diagnostic in GMM estimation to analyse the model's suitability. This test will be applied to our regression model analysis which will help in identifying the correlation of which, the set of exogenous variables should be uncorrelated to the residuals. The Sargan-Hansen test is utilised to test whether the instrumental variables are either correlated or uncorrelated towards some of the residuals. The hypothesis statements of the test are specified as below:

H_0: The instruments are valid (instruments are uncorrelated with the error term)

H_1: The instruments are invalid (instruments are correlated with the error term)

Therefore, if the null hypothesis is rejected, it implies that the instruments are invalid, in other words, they are correlated with the error term. This situation might occur if the instruments are not genuinely exogenous or that they are wrongly taken out from the regression (Baum, Schaffer, & Stillman, 2003). On the other hand, if the null hypothesis is not rejected, it means that the instruments are valid and are uncorrelated with the error term. Hence, obtaining a higher p-value for the Sargan-Hansen test is better since it indicates that the model is valid.

3.6.4 Arellano-Bond Serial Correlation test

The Arellano-Bond Serial Correlation test (AB test) was first proposed by Arellano and Bond (1991) to identify the autocorrelation in the disturbances. According to the authors, with regards to the assumption of white noise errors, if the error has serial correlation, an estimator that applies lags as its instruments will result in being inconsistent. The validity of the instruments will be affected if there is serial autocorrelation present in the disturbances (Brañas-Garza, Bucheli & García-

Muñoz, 2011). Hence, it is crucial to ensure the non-existence of serial correlation in order to preserve the validity of the instruments. The hypothesis statements of the Arellano-Bond test are stated as follows:

H_0: There is no serial correlation (instruments are valid)

H_1: There is serial correlation (instruments are invalid)

If the null hypothesis is being rejected, this implies that serial correlation is present, thus the instrumental variables are invalid. However, if the null hypothesis is not rejected, this implies an absence of serial correlation, hence the instrumental variables are valid. An autoregressive process is used to determine the serial correlation in which the first order or AR(1) process indicates that the current value is influenced by its past value. On the other hand, the second order process, AR (2) indicates that the current value is influenced by its past two values.

3.7 Chapter Conclusion

In this chapter, the research design of our study is introduced initially, followed by the sources of data which is tabulated and presented in this chapter as well as data descriptions on the variables. Furthermore, the empirical model is specified followed by the diagnostic checking that will be carried out to check the feasibility of the data. Hence, in the next chapter, the empirical results of the study will be presented and interpreted.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

In this chapter, we will present the descriptive statistics of the data in order to feel the data in an overall sense. We will also tabulate and discuss the results of the empirical data as well as interpret the results that are obtained through the method discussed in Chapter 3 so as to determine the relationship between the dependent variable and the independent variables and their significancy. Furthermore, the results of the diagnostic checking carried out on the empirical model will be laid out in this chapter.

4.1 Descriptive Statistics

Table 4.1: Descriptive statistics for each variable

Variables	Mean	Median	Maximum	Minimum	Standard deviation
LNROA	-3.6567	-3.6028	-1.8421	-9.0258	1.0116
LNCORRUPTION	3.9068	3.9120	3.9703	3.8501	0.0412
LNGDP	1.6120	1.5623	1.7929	1.4593	0.1206
LNFINANCIAL LEVERAGE	-0.0232	0.0034	2.7162	-1.9131	0.7854
LNSTATE OWNERSHIP	4.2167	4.2522	4.5490	3.4610	0.2192

Table 4.1 depicts the descriptive statistics of 24 GLCs in Malaysia from the year 2013 to 2019. Referring to Table 4.1, the average of ROA during these periods is -3.6567 while the highest figure of ROA is -1.8421 while the lowest is -9.0258 while the standard deviation indicates how far the variables deviate from the mean, in which the standard deviation of ROA is 1.0116. The value for the mean, median, maximum and minimum of ROA are negative since the ROA collected on the companies for each year are less than one, and that the log of value which is less than one will always be negative while the log of negative value is unattainable. The mean for corruption, GDP, financial leverage and state ownership are 3.9068, 1.6120, -0.0232 and 4.2167 respectively. The maximum value for GDP is 1.7929 while the minimum value is 1.4593. As for the highest figure of state ownership, it is 4.5490 while the lowest figure is 3.4610. By observing the standard deviation, it is clear that corruption has the lowest standard deviation at 0.0412, meaning that it deviates slightly from the mean value.

4.2 Difference GMM Approach

The descriptive statistics showed the result of difference GMM for all companies. The independent variables are GDP, financial leverage, state ownership, and corruption. Table 4.2 will show the estimated model result on difference GMM. The table shows the effects of explanatory variables which are ROA_{t-1} as well as the 4 independent variables on ROA. Difference GMM includes only 5 years data from 2015 to 2019 for 22 companies with 86 number of observations due to the automatic adjustment in GMM method.

4.2.1 Estimation Results

Table 4.2 Result of GMM from EViews

Dependent variable: Return on asset (ROA)

	Difference GMM (Dependent: ROA)
Variables	GMM
LNROA (-1)	0.331781 (0.0000) ***
LNGDP	1.461658 (0.0000)***
LNLEV	-0.159153 (0.3163)
LN CRRPT	1.414437 (0.0057) ***
LNSO	2.205353 (0.0001) ***
No. of Observations	86
No. of GLCs	22
Sargan Test	10.81602 (0.700425)
AR (1)	-2.083705 (0.0372)**
AR (2)	0.552693 (0.5805)

Notes: - LN = Natural Logarithm; GDP= Gross Domestic Product; LEV=Financial Leverage; EXP=Operating Expenditure; CRRPT=Corruption; SIZE=Firm Size; SO=State Ownership

- ***, **, and * represent significant levels at 1%, 5%, and 10% respectively
- Figures in parentheses are p-value

4.2.2 Interpretation of Regression Estimation

Table 4.2 shows the GMM estimation output in which GDP has a highly significant positive relationship with ROA at p-value 0.0000. Thus, if 1% increase in GDP, on average, ROA will increase 1.461658%, ceteris paribus. For LEV, the result obtained an insignificant negative relationship with ROA since the coefficient is -0.159153 with the p-value of 0.3163 where it exceeds three of the significant levels at 1%, 5%, and 10%. Apart from that, CRRPT is positively related with ROA at 1% significant level with p-value 0.0057. This can be described as, if CRRPT increases by 1%, on average, ROA will increase by 1.414437%, ceteris paribus. The significant positive relationship at 1% significant level is also exhibited by SO. Thus, if SO increases by 1%, on average, ROA will increase by 2.205353%, ceteris paribus.

In order to verify the consistency of the expected and the actual relationship between each explanatory variable and explained variable, Table 4.2 illustrated the actual results of difference GMM estimation by using ROA of 24 GLCs in Malaysia while the expected relationship is predicted based on the theories in Chapter 2.

According to Ramli, Latan and Solovida (2018), GDP is used as proxy for the growth rate of economic condition in a country. The profitability of a firm will increase when the economy is growing. It also means that, when a country has a high GDP, the performance of the domestic firm will be improved. This is supported by Tanaka, Boom, David and Koga (2020) stating that the firm performance is sensitively correlated with economic growth, the growing economic brings better input choice which may improve the firm performance such as employees and investments. In addition, boosted GDP will increase the purchasing

power of the consumer which leads to the higher profitability of the company, followed by an increase in its performance (Romus, 2020). Firm financial performance is strongly affected by the macroeconomic environment, as GDP growth will improve the firm performance (Vieira, Neves, and Dias, 2020; Issah and Antwi, 2017). Moreover, APT is also in line with the above statement, as GDP growth rate rises, profitability of firm will increase. According to those studies and theory, there is a consistent result on the positive significant relationship between economic growth and firm performance.

The negative relationship between financial leverage and firm performance is inconsistent since the expected and the actual sign are not similar. The actual result portrayed that an increase in financial leverage will decrease the firm performance which is in opposition to static trade-off theory stating that more financial leverage will improve the firm performance, as the benefit of tax shield is present. Yet due to the inefficient use of debt, the firm performance will decline. Therefore, the downside of financial leverage is larger than the benefit (Bui, 2020; Abu-Abbas, Alhmoud and Algazo, 2019). Besides that, when the firm keeps increasing its financial leverage, and its revenue reaches the equilibrium, this will cause the firm performance to begin decreasing (Ibhagui and Olokoyo, 2018). Other study has indicated that interest payment will increase if the firm increases its financial leverage leading to declining net earnings (Ndubuisi, Ifechi, Nweke and Joel, 2019). Additionally, the inefficient use of debt to generate profit, will result in the inability to pay off higher cost of debt causing bankruptcy (Rahman, Saima, and Jahan, 2020).

Moreover, there is an inconsistency of expected and actual results on state ownership where the result indicated that state ownership has a significant positive relationship with performance of GLCs in Malaysia. However, the agency theory stated that managers and shareholders' interest conflicts will affect the performance of GLCs. Hence, the increase in percentage of state ownership will lead to efficient managers and thus improve performance of companies. Moreover, this could also

be due to state-owned companies having greater access to insider information and the potential to gain leverage over legislation and laws, and also recruit skilled workers through higher pay and bonuses. Others research also clarified that increased state ownership will improve the companies' performance (Eforis, 2018; Yi, Hong, Hsu & Wang, 2017; Nguyen, Vo, Phung & Le, 2019; Kubo & Huu, 2019; Zulaikah, Larasati & Harymawan, 2019).

There is a consistency of expected and actual result on corruption where corruption has significant positive relationship with the performance of GLCs in Malaysia. This is supported by the "grease the wheels" hypothesis where it stated that corruption positively contributes to development and growth by compensating the inefficient administration and regulations of companies. This statement is also supported by Das & Mahalik (2020) where the corruption in host countries has significantly increased the firm performance in the resource-based sector. This can be due to firms using political connections to expand market share and get easy access to credit resources (Ashyrov and Akuffo, 2020). It is also supported by Wang, Yao, and Kang (2019) that higher political connection has benefited the firm performance by making easier access to investment projects and bank loans.

4.3 Diagnostic Checking

4.3.1 Multicollinearity

Table 4.3: Pair-wise Correlation Matrix

	LNSO	**LNGDP**	**LNLEV**	**LNCRRPT**
LNSO	1.000000	0.079977	0.169941	-0.006001
LNGDP	0.079977	1.000000	-0.015566	-0.162780
LNLEV	0.169941	-0.015566	1.000000	0.023042
LNCRRPT	-0.006001	-0.162780	0.023042	1.000000

Notes: LN= Natural Logarithm; GDP= Gross Domestic Product; LEV= Financial Leverage; CRRPT= Corruption; SO= State Ownership

The pair-wise test correlation coefficient has been conducted in this study for detecting the problem of multicollinearity. According to Shrestha (2020), the problem of multicollinearity happens if the correlation coefficient value is high between the pairwise variables. In other words, if the absolute value of correlation coefficient is higher than or close to 0.8, multicollinearity problem is detected. Based on the result of test shown in Table 4.3, it summarized that there is no serious multicollinearity problem in this model since the correlation coefficient of each pair-wise variables are less than 0.8.

4.3.2 Unit Root Test

In this research, we performed the Fisher Augmented Dickey-Fuller (ADF) test to evaluate the stationarity of series by observing the null hypothesis of unit root for all variables rather than using LLC test and IPS test. The advantage of this test is that it is not necessary that a balanced panel dataset is required. Besides, the option of the lag length for each sample can be individually decided by using ADF test. Moreover, for the ADF test, there is no limit in specifying the sample size for different samples as sample size can vary based on the availability of the data (Maddala & Wu, 1999).

Table 4.4: Unit Root Test of Malaysian GLCs in Level and First Differences

Variables	Fisher-ADF Test			
	Level		First difference	
	Individual intercept	Individual intercept and trend	Individual intercept	Individual intercept and trend
LN Return on assets	38.7230	34.5846	67.7497***	32.0111
LN GDP	94.8056***	79.9901***	129.860***	57.4699
LN Financial leverage	45.8471	34.7627	93.3924***	100.668***
LN State ownership	42.0063	50.4309	75.2063***	44.6582
LN Corruption	33.9605	6.62782	15.3398	3.17168

Notes: LN means that form of natural logarithm. *, **, *** are representing the significant level at 10 percent, 5 percent, and 1 percent, respectively

H_0: There is a unit root in each variable.

H_1: There is no unit root in each variable.

Table 4.4 shows the result of ADF test in level and first difference form. Based on the results, all variables relating to Malaysian GLCs performance have been tested for unit root for both individual intercept without trend and with trend. The result showed that only GDP is stationary at level form with individual intercept in 1%, 5% and 10% significant level. In contrast, other variables are not stationary with individual intercept in level form as they are insignificant in 1%, 5% and 10% significant level. On the other hand, the results on individual intercept with trend indicated that all the variables are not significant at all significant level except GDP. In order to achieve stationary status for all variables at all significant levels, we continued to performing first difference for ADF test.

From the table, it is clear that the unit root test result in first difference showed that all the variables do not have unit root with individual intercept at 1%, 5% and 10% significant level except corruption. However, regarding to part of individual intercept with trend, there is only one variable that are stationary at 1%, 5% and 10% significant level, which is financial leverage. Instead, other variables have unit root with individual intercept and trend, which are ROA, GDP, state ownership and corruption.

4.3.3 Sargan-Hansen Test

Table 4.5: Summary of Sargan-Hansen Test

No. of GLCs: 22 No. of observation (unbalanced) : 86	
Hypothesis	H_0: The instrumental variables are uncorrelated with the error term H_1: The instrumental variables are correlated with the error term
Decision Rule	Reject H_0 if the p-value is smaller than 0.01, 0.05 & 0.1. Otherwise, do not reject H_0
P-value	0.700425
Decision: The instrumental variables are uncorrelated with the error term in the model	

Note: *, **, ***, Significant at 10%, 5%, 1% respectively.

Under the test of Sargan-Hansen in the table 4.5, it can be summarized that the instrumental variables involved in the estimated model are valid in relation to the ROA, implying that the first difference instrumental variables are uncorrelated with error term in the model as p-value is 0.700425 which is larger than the significant level of 1%, 5% and 10%.

4.3.4 Arellano-Bond Correlation Test

Figure 4.1: Arellano-Bond Serial Correlation Test (EViews)

Arellano-Bond Serial Correlation Test

Equation: Untitled

Date: 04/02/21 Time: 01:31

Sample: 2013 2019

Included observations: 86

Test order	m-Statistic	rho	SE(rho)	Prob.
AR(1)	-2.083705	-27.091240	13.001474	0.0372
AR(2)	0.552693	3.121147	5.647162	0.5805

According to the result generated from E-view in Figure 4.1, the implementation of Arellano-Bond serial correlation test has indicated that the instrumental variables are invalid at significant level of 1%, 5% and 10% via the p-value results at 0.0372 for AR (1). Hence, there is first-order serial correlation happening in the ordinary level form since p-value of AR (1) is larger than significant level. Additionally, the error terms in the first difference regression indicated that no second-order serial correlation is detected since the p-value result is 0.5805 for AR (2) is greater than significant level of 1%, 5% and 10%. Therefore, the instrumental variables are valid at significant level of 1%, 5% and 10%, and also it would fulfil the criteria of Arellano-Bond correlation test. Furthermore, it is vital to refer to the result of AR (2) as compared to AR (1) since AR (2) test is used to check for the presence of second-order serial correlation in differences form (Chung, Kim & Park, 2018). In other words, the underlying model we estimated is based on differences in order level rather than ordinary level form.

4.4 Chapter Conclusion

Overall, in this chapter, we tabulated the results obtained from the Difference GMM approach used in estimating the model as well as to identify the relationship between the variables and interpret the results gained through our findings. The diagnostic check of the unit root test, Sargan-Hansen test as well as AB serial correlation test results were also displayed in this chapter.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATION

5.1 Conclusion

The primary objective of this research is to examine the determinants of GLCs performance in Malaysia, especially to shed light on whether corruption will affect the performance of GLCs since corruption is inherent in companies related to the government. This study used secondary data analysis by taking into consideration 24 GLCs in Malaysia from 2013 to 2019. The Difference GMM approach is used to carry out the empirical analysis since it is able to remove the individual effects, in other words solve the endogeneity problem.

Based on the empirical results obtained, we found that there is a significant positive relationship between GDP, state ownership and corruption on GLCs performance while for financial leverage, although it adversely affects GLCs performance, its impact is insignificant. According to the results, we are able to answer the research questions in which we can determine the factors that influence firm performance and show that corruption does influence the performance of GLCs in Malaysia. The relationship of GDP is found to be consistent with past research and the arbitrage pricing theory, besides, corruption is also consistent with past studies and the "grease the wheels" hypothesis. However, financial leverage and state ownership showed inconsistent outcomes when compared to past papers and theories.

Besides that, this research also provides significant insights to government, managers and future researchers in making more informed decisions based on the results obtained from this research. Moreover, the limitations of the study are addressed and recommendations are suggested which may benefit future studies.

5.2 Implication of Research

This study primarily focuses on examining the impact of economic growth, financial leverage, state ownership, and corruption on GLCs performance in Malaysia. Additionally, the outcomes of this study highlighted several important issues that require the attention of government policymakers to discuss some critical ways in making a policy and strategic decisions as well as appealing to managers of companies in making better decisions to ensure better company prospect. Moreover, it can be a helpful resource for future researchers to examine the relationship between GLCs performance and the factors identified in this research such as GDP, financial leverage, state ownership, and also to investigate the effect of corruption on the performance of GLCs in Malaysia.

5.2.1 Implication

This research is important for Malaysia's government to gain insights on the factors that will affect the performance of GLCs in Malaysia to enable the implementation of better strategies and controls that can help improve the performance of the companies. Furthermore, it also contributes knowledge towards managers and future researchers. According to the result of this paper, the government should consider some effective measures to prevent the factors that will highly affect the performance of GLCs.

Government

Government can evaluate and improve the policies for GLCs in Malaysia. This paper can act as a reference for the government to review and enhance policies for GLCs by taking those results into account.

Based on the result, GDP showed a positive and significant relationship with ROA. It implied that increase in GDP will lead to higher purchasing power, thus the demand for products and services will increase. As a result, the performance of GLCs will increase. Government should take into account the effect on the performance of GLCs while making decisions on fiscal policy especially on interest rate. When the government decides to decrease the cost of borrowing to help consumers as well as investors, GLCs performance will strengthen due to low interest rates.

Moreover, corruption shows a positive and significant relationship with performance of GLCs in Malaysia. This could be due to the firm's ability to leverage government ties to increase profit and gain quick access to financial services. As a result, increased political corruption could assist the firm in eliminating competitors and improving firm efficiency. However, the government should discourage corruption as it will weaken a country in the long run. Malaysia’s government should adopt the soft structuring policies, restructuring police and simplifying taxes as Uruguay has found it effective. This is the right direction to take in order to directly monitor corruption. In the sense of mass misbehaviour encouraged by inadequate regulation in our country, partial regulation becomes unavoidable, and thus anti-corruption regulations may create new profits while protecting old ones, conceiving rather than modifying the policies.

Manager

The result shows that financial leverage has a negative but insignificant relationship with ROA. Thus, the performance of GLCs does not rely on the financial leverage of the company. Nevertheless, managers can always keep track of the company debt ratio to maintain a healthy ratio to ensure a stable balance sheet although it does not have actual effects on GLCs performance. If the ratio is too high, the firm is in financial trouble and therefore unable to pay its creditors. Thus, this will lead to creditors to seize firm's assets or compel the firm to declare bankruptcy. Therefore, firm should still pay attention to the stability of their financial leverage.

Future Researchers

This research can provide insight for future researchers on the knowledge of factors that will affect performance of GLCs. As the papers focus on the performance of GLCs as well as corruption in Malaysia, future researchers can benefit from the theoretical and empirical results of this paper. Therefore, they are able to provide more theory and understanding on this area of study.

5.3 Limitations of the study

Every research has its own limitations which is the same for this study, there are a few limitations in this study which will be addressed in the following paragraphs. It is vital to highlight the shortcomings of this study to enable future researchers to take precaution and find ways to rectify or improve these limitations when conducting research in the future.

One of the limitations of this study is the lack of sample size as the number of GLCs

used in this study is only 24 companies while the period is only for 7 years. The selections of companies are limited as we took into account the financial year end reporting date to avoid complications in calculations while the time period for 7 years is also considered less since some of the companies only have annual reports available from 2012, thus we are unable to take into account longer periods of time. Due to the lack of data collected, it may affect the results of our estimation.

Besides, the independent variables used in capturing the effects on GLCs performance might not be as comprehensive since the number of the independent variables are limited. This is because other important factors that might impact the performance of GLCs such as firm size, liquidity as well as other macroeconomic factors are not taken into account.

Furthermore, there is a lack of journals that study on GLCs performance in Malaysia, especially on how corruption will impact GLCs, thus this study had to refer to journals that research on companies in other sectors in different countries.

Apart from that, the proxy for corruption is obtained from Transparency International which are usually used to measure the corruption intensity at the national level instead of the firm level. It might not be able to accurately capture the corruption level at firm level, thus this might affect the precision of our results.

5.4 Recommendations of the study

Based on the limitations of the study, several recommendations are suggested to future researchers which may benefit them in carrying out their future research. One of the recommendations is to address the lack of sample size is that future researchers may consider adding more companies or extending the period of study as well as increasing the number of independent variables that are relevant to the study. For future researches

that employs GMM, it might be useful to refer to Roodman (2009) as a guideline in specifying sample size. According to Roodman (2009), there should be small t (time) and large n (number of observations) when employing GMM. Besides, it is also vital to avoid the problem of having too many instruments, hence the number of instruments used in the model should be lesser than the number of cross-sections.

As for the lack of research papers, it is recommended that future researchers can focus more on conducting studies related to the topic of GLCs in Malaysia. This would increase the number of papers on this specific field which will benefit others.

Moreover, future researchers are also encouraged to explore other alternative proxies for corruption. This study uses corruption perceptions index as a proxy for corruption which is a measurement at a national level. Therefore, future researchers are recommended to use other proxies that might be more suitable to capture the impacts of corruption at the firm level.

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APPENDICES

Appendix 1.1: The average of GLCs' debt to equity ratio from 2013 to 2019 in Malaysia

	GLCs	Debt to Equity ratio
1	FGV Holding Berhads	1.59
2	Axiata Group Berhad	1.41
3	Telekom Malaysia Berhad	2.21
4	Malaysia Arport Bhd	0.97
5	UMW Holding Berhad	0.97
6	MBSB	7.31
7	TH Plantation Berhad	1.34
8	Pasdec Holding Berhad	0.66
9	Theta Edge Berhad	0.38
10	Boustead Holding Berhad	1.62
11	UEM Sunrise Berhad	0.67
12	UEM Edgenta	0.88
13	MRCB	1.62
14	MMC Corporation Bhd	1.91
15	Heitech Padu Bhd	1.85
16	PHARMANIAGA BERHAD	2.02
17	BINTULU PORT HOLDINGS BERHAD	1.37
18	BINA DARULAMAN BERHAD	1.14
19	CHEMICAL COMPANY OF MALAYSIA BERHAD	1.07
20	TDM BERHAD	0.89
21	IHH Healthcare Berhad	0.49
22	Petronas Dagangan	0.76
23	Time Dotcom Berhad	0.25
24	MISC Berhad	0.43

Sources: Annual Report of each GLCs from 2013 to 2019

Appendix 1.2: The average of GLCs' shares ownership owned by Government from 2013 to 2019

GLCs	Percentage of Shares owned by government (%)
FGV	69.90
Axiata	72.27
TM	68.72
Malaysia Airport	60.77
UMW	75.09
MBSB	66.76
TH Plantation	80.42
Pasdec	42.42
Theta Edge	68.69
Boustead Holdings Berhad	70.05
UEM Sunrise Berhad	76.73
UEM Edgenta	78.99
MRCB	45.83
MMC Corporation	83.64
Heitech Padu Bhd	52.14
Pharmaniaga Bhd	73.32
Bintulu Port Holdings Bhd	93.94
Bina Darulaman Bhd	65.45
Chemical Company of Malaysia	68.51
TDM Berhad	67.44
IHH Healthcare Berhad	50.33

Petronas Dagangan	84.62
Time Dotcom Bhd	47.94
MISC Bhd	77.51

Source: Annual Report 2013-2019

Appendix 3.1: List of Company's Annual Report

1. FGV Holdings Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
2. Axiata Group Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
3. Telekom Malaysia Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
4. Malaysia Airport Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
5. UMW Holdings Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
6. Malaysia Building Society Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
7. TH Plantations Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
8. Pasdec Holdings Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
9. Theta Edge Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
10. Boustead Holdings Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
11. UEM Sunrise Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
12. UEM Edgenta Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
13. Malaysian Resources Corporation Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
14. MMC Corporation Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
15. Heitech Padu Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
16. Pharmaniaga Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
17. Bintulu Port Holdings Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
18. Bina Darulaman Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.

19. Chemical Company of Malaysia Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
20. TDM Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
21. Petronas Dagangan Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
22. Time Dotcom Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
23. MISC Berhad. (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.
24. IHH Healthcare Berhad (2013-2019). *Annual Report.* Kuala Lumpur, Malaysia.

Appendix 4.1: Panel regression analysis result from Eviews (GMM)

Dependent Variable: LNROA
Dependent Variable: LNROA
Method: Panel Generalized Method of Moments
Transformation: First Differences
Date: 04/02/21 Time: 01:30
Sample (adjusted): 2015 2019
Periods included: 5
Cross-sections included: 22
Total panel (unbalanced) observations: 86
White period instrument weighting matrix
White period standard errors & covariance (d.f. corrected)
Instrument specification: @DYN(LNROA,-2) LNGDP(-1) LNFINANCIALLEVERAGE(-1) LNSTATEOWNERSHIP(-1) LNCORRUPTION(-1)
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNROA(-1)	0.331781	0.049304	6.729283	0.0000
LNGDP	1.461658	0.184905	7.904896	0.0000
LNFINANCIALLEVERAGE	-0.159153	0.157847	-1.008273	0.3163
LNSTATEOWNERSHIP	2.205353	0.535742	4.116443	0.0001
LNCORRUPTION	1.414437	0.497908	2.840757	0.0057

Effects Specification

Cross-section fixed (first differences)

Root MSE	1.324271	Mean dependent var	-0.234045
S.D. dependent var	1.074114	S.E. of regression	1.364531
Sum squared resid	150.8176	J-statistic	10.81602
Instrument rank	19	Prob(J-statistic)	0.700425

Appendix 4.2: Unit Root Test: ADF Test-Fisher

Corruption:
Level: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: LNCORRUPTION
Date: 03/12/21 Time: 01:09
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	33.9605	0.9373
ADF - Choi Z-stat	-0.08757	0.4651

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNCORRUPTION

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.4929	0	0	6
Axiata Group Berhad	0.4929	0	0	6
Telekom Malaysia Bhd	0.4929	0	0	6
Malaysia Airport Bhd	0.4929	0	0	6
UMW Holdings Berhad	0.4929	0	0	6
MBSB	0.4929	0	0	6
TH Plantations Berhad	0.4929	0	0	6
Pasdec Holdings Berhad	0.4929	0	0	6
Theta Edge Berhad	0.4929	0	0	6
Boustead Holdings Berhad	0.4929	0	0	6
UEM Sunrise Berhad	0.4929	0	0	6
UEM Edgenta	0.4929	0	0	6
MRCB	0.4929	0	0	6
MMC Corporation Bhd.	0.4929	0	0	6
HEITECH PADU Bhd.	0.4929	0	0	6
PHARMANIAGA BERHAD	0.4929	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.4929	0	0	6
BINA DARULAMAN BERHAD	0.4929	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.4929	0	0	6
TDM BERHAD	0.4929	0	0	6
IHH Healthcare Berhad	0.4929	0	0	6
Petronas Dagangan	0.4929	0	0	6
Time Dotcom Berhad	0.4929	0	0	6
MISC Berhad	0.4929	0	0	6

Individual intercept and trend:

Null Hypothesis: Unit root (individual unit root process)
Series: LNCORRUPTION
Date: 03/12/21 Time: 01:11
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	6.62782	1.0000
ADF - Choi Z-stat	5.54207	1.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNCORRUPTION

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.8710	0	0	6
Axiata Group Berhad	0.8710	0	0	6
Telekom Malaysia Bhd	0.8710	0	0	6
Malaysia Airport Bhd	0.8710	0	0	6
UMW Holdings Berhad	0.8710	0	0	6
MBSB	0.8710	0	0	6
TH Plantations Berhad	0.8710	0	0	6
Pasdec Holdings Berhad	0.8710	0	0	6
Theta Edge Berhad	0.8710	0	0	6
Boustead Holdings Berhad	0.8710	0	0	6
UEM Sunrise Berhad	0.8710	0	0	6
UEM Edgenta	0.8710	0	0	6
MRCB	0.8710	0	0	6
MMC Corporation Bhd.	0.8710	0	0	6
HEITECH PADU Bhd.	0.8710	0	0	6
PHARMANIAGA BERHAD	0.8710	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.8710	0	0	6
BINA DARULAMAN BERHAD	0.8710	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.8710	0	0	6
TDM BERHAD	0.8710	0	0	6
IHH Healthcare Berhad	0.8710	0	0	6
Petronas Dagangan	0.8710	0	0	6
Time Dotcom Berhad	0.8710	0	0	6
MISC Berhad	0.8710	0	0	6

1st difference: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNCORRUPTION)
Date: 03/12/21 Time: 01:12
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	15.3398	1.0000
ADF - Choi Z-stat	2.94980	0.9984

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNCORRUPTION)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.7265	0	0	5
Axiata Group Berhad	0.7265	0	0	5
Telekom Malaysia Bhd	0.7265	0	0	5
Malaysia Airport Bhd	0.7265	0	0	5
UMW Holdings Berhad	0.7265	0	0	5
MBSB	0.7265	0	0	5
TH Plantations Berhad	0.7265	0	0	5
Pasdec Holdings Berhad	0.7265	0	0	5
Theta Edge Berhad	0.7265	0	0	5
Boustead Holdings Berhad	0.7265	0	0	5
UEM Sunrise Berhad	0.7265	0	0	5
UEM Edgenta	0.7265	0	0	5
MRCB	0.7265	0	0	5
MMC Corporation Bhd.	0.7265	0	0	5
HEITECH PADU Bhd.	0.7265	0	0	5
PHARMANIAGA BERHAD	0.7265	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.7265	0	0	5
BINA DARULAMAN BERHAD	0.7265	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.7265	0	0	5
TDM BERHAD	0.7265	0	0	5
IHH Healthcare Berhad	0.7265	0	0	5
Petronas Dagangan	0.7265	0	0	5
Time Dotcom Berhad	0.7265	0	0	5
MISC Berhad	0.7265	0	0	5

1st difference: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNCORRUPTION)
Date: 03/12/21 Time: 01:12
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	3.17168	1.0000
ADF - Choi Z-stat	7.45873	1.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNCORRUPTION)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.9361	0	0	5
Axiata Group Berhad	0.9361	0	0	5
Telekom Malaysia Bhd	0.9361	0	0	5
Malaysia Airport Bhd	0.9361	0	0	5
UMW Holdings Berhad	0.9361	0	0	5
MBSB	0.9361	0	0	5
TH Plantations Berhad	0.9361	0	0	5
Pasdec Holdings Berhad	0.9361	0	0	5
Theta Edge Berhad	0.9361	0	0	5
Boustead Holdings Berhad	0.9361	0	0	5
UEM Sunrise Berhad	0.9361	0	0	5
UEM Edgenta	0.9361	0	0	5
MRCB	0.9361	0	0	5
MMC Corporation Bhd.	0.9361	0	0	5
HEITECH PADU Bhd.	0.9361	0	0	5
PHARMANIAGA BERHAD	0.9361	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.9361	0	0	5
BINA DARULAMAN BERHAD	0.9361	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.9361	0	0	5
TDM BERHAD	0.9361	0	0	5
IHH Healthcare Berhad	0.9361	0	0	5
Petronas Dagangan	0.9361	0	0	5
Time Dotcom Berhad	0.9361	0	0	5
MISC Berhad	0.9361	0	0	5

Financial leverage:
Level: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: LNFINANCIALLEVERAGE
Date: 03/12/21 Time: 01:15
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	45.8471	0.5615
ADF - Choi Z-stat	0.33002	0.6293

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNFINANCIALLEVERAGE

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.8774	0	0	6
Axiata Group Berhad	0.8500	0	0	6
Telekom Malaysia Bhd	0.9899	0	0	6
Malaysia Airport Bhd	0.5882	0	0	6
UMW Holdings Berhad	0.4197	0	0	6
MBSB	0.0650	0	0	6
TH Plantations Berhad	0.9548	0	0	6
Pasdec Holdings Berhad	0.3794	0	0	6
Theta Edge Berhad	0.5979	0	0	6
Boustead Holdings Berhad	0.7488	0	0	6
UEM Sunrise Berhad	0.3344	0	0	6
UEM Edgenta	0.0295	0	0	6
MRCB	0.8236	0	0	6
MMC Corporation Bhd.	0.3670	0	0	6
HEITECH PADU Bhd.	0.2611	0	0	6
PHARMANIAGA BERHAD	0.9577	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.4527	0	0	6
BINA DARULAMAN BERHAD	0.6203	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.1006	0	0	6
TDM BERHAD	0.2477	0	0	6
IHH Healthcare Berhad	0.7052	0	0	6
Petronas Dagangan	0.2891	0	0	6
Time Dotcom Berhad	0.4619	0	0	6
MISC Berhad	0.1172	0	0	6

Level: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: LNFINANCIALLEVERAGE
Date: 03/12/21 Time: 01:16
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	34.7627	0.9237
ADF - Choi Z-stat	1.20237	0.8854

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNFINANCIALLEVERAGE

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.0923	0	0	6
Axiata Group Berhad	0.2881	0	0	6
Telekom Malaysia Bhd	0.8002	0	0	6
Malaysia Airport Bhd	0.7993	0	0	6
UMW Holdings Berhad	0.9080	0	0	6
MBSB	0.0800	0	0	6
TH Plantations Berhad	0.9445	0	0	6
Pasdec Holdings Berhad	0.8491	0	0	6
Theta Edge Berhad	0.6690	0	0	6
Boustead Holdings Berhad	0.9561	0	0	6
UEM Sunrise Berhad	0.7885	0	0	6
UEM Edgenta	0.1738	0	0	6
MRCB	0.3720	0	0	6
MMC Corporation Bhd.	0.8282	0	0	6
HEITECH PADU Bhd.	0.5672	0	0	6
PHARMANIAGA BERHAD	0.4532	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.8455	0	0	6
BINA DARULAMAN BERHAD	0.2928	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.3287	0	0	6
TDM BERHAD	0.6815	0	0	6
IHH Healthcare Berhad	0.4522	0	0	6
Petronas Dagangan	0.5501	0	0	6
Time Dotcom Berhad	0.7162	0	0	6
MISC Berhad	0.4163	0	0	6

1st difference: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNFINANCIALLEVERAGE)
Date: 03/12/21 Time: 01:17
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	93.3924	0.0001
ADF - Choi Z-stat	-4.29246	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNFINANCIALLEVERAGE)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.0255	0	0	5
Axiata Group Berhad	0.0370	0	0	5
Telekom Malaysia Bhd	0.5204	0	0	5
Malaysia Airport Bhd	0.4054	0	0	5
UMW Holdings Berhad	0.5720	0	0	5
MBSB	0.0044	0	0	5
TH Plantations Berhad	0.6575	0	0	5
Pasdec Holdings Berhad	0.5852	0	0	5
Theta Edge Berhad	0.3218	0	0	5
Boustead Holdings Berhad	0.7556	0	0	5
UEM Sunrise Berhad	0.3185	0	0	5
UEM Edgenta	0.0121	0	0	5
MRCB	0.2474	0	0	5
MMC Corporation Bhd.	0.2648	0	0	5
HEITECH PADU Bhd.	0.1306	0	0	5
PHARMANIAGA BERHAD	0.1629	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.3159	0	0	5
BINA DARULAMAN BERHAD	0.0194	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.0527	0	0	5
TDM BERHAD	0.2424	0	0	5
IHH Healthcare Berhad	0.0902	0	0	5
Petronas Dagangan	0.1317	0	0	5
Time Dotcom Berhad	0.1045	0	0	5
MISC Berhad	0.2129	0	0	5

1st difference: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNFINANCIALLEVERAGE)
Date: 03/12/21 Time: 01:17
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	100.668	0.0000
ADF - Choi Z-stat	-4.30792	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNFINANCIALLEVERAGE)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.1669	0	0	5
Axiata Group Berhad	0.0860	0	0	5
Telekom Malaysia Bhd	0.7438	0	0	5
Malaysia Airport Bhd	0.1748	0	0	5
UMW Holdings Berhad	0.5068	0	0	5
MBSB	0.0012	0	0	5
TH Plantations Berhad	0.4198	0	0	5
Pasdec Holdings Berhad	0.4381	0	0	5
Theta Edge Berhad	0.3599	0	0	5
Boustead Holdings Berhad	0.8115	0	0	5
UEM Sunrise Berhad	0.4178	0	0	5
UEM Edgenta	0.0572	0	0	5
MRCB	0.7537	0	0	5
MMC Corporation Bhd.	0.0478	0	0	5
HEITECH PADU Bhd.	0.2223	0	0	5
PHARMANIAGA BERHAD	0.4492	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.0890	0	0	5
BINA DARULAMAN BERHAD	0.0013	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.1634	0	0	5
TDM BERHAD	0.0034	0	0	5
IHH Healthcare Berhad	0.2267	0	0	5
Petronas Dagangan	0.1607	0	0	5
Time Dotcom Berhad	0.0292	0	0	5
MISC Berhad	0.3800	0	0	5

GDP
Level: individual Intercept

Null Hypothesis: Unit root (individual unit root process)
Series: LNGDP
Date: 03/15/21 Time: 01:37
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	94.8056	0.0001
ADF - Choi Z-stat	-5.32016	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNGDP

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.1387	0	0	6
Axiata Group Berhad	0.1387	0	0	6
Telekom Malaysia Bhd	0.1387	0	0	6
Malaysia Airport Bhd	0.1387	0	0	6
UMW Holdings Berhad	0.1387	0	0	6
MBSB	0.1387	0	0	6
TH Plantations Berhad	0.1387	0	0	6
Pasdec Holdings Berhad	0.1387	0	0	6
Theta Edge Berhad	0.1387	0	0	6
Boustead Holdings Berhad	0.1387	0	0	6
UEM Sunrise Berhad	0.1387	0	0	6
UEM Edgenta	0.1387	0	0	6
MRCB	0.1387	0	0	6
MMC Corporation Bhd.	0.1387	0	0	6
HEITECH PADU Bhd.	0.1387	0	0	6
PHARMANIAGA BERHAD	0.1387	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.1387	0	0	6
BINA DARULAMAN BERHAD	0.1387	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.1387	0	0	6
TDM BERHAD	0.1387	0	0	6
IHH Healthcare Berhad	0.1387	0	0	6
Petronas Dagangan	0.1387	0	0	6
Time Dotcom Berhad	0.1387	0	0	6
MISC Berhad	0.1387	0	0	6

Level: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: LNGDP
Date: 03/15/21 Time: 01:38
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	79.9901	0.0026
ADF - Choi Z-stat	-4.32042	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNGDP

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.1889	0	0	6
Axiata Group Berhad	0.1889	0	0	6
Telekom Malaysia Bhd	0.1889	0	0	6
Malaysia Airport Bhd	0.1889	0	0	6
UMW Holdings Berhad	0.1889	0	0	6
MBSB	0.1889	0	0	6
TH Plantations Berhad	0.1889	0	0	6
Pasdec Holdings Berhad	0.1889	0	0	6
Theta Edge Berhad	0.1889	0	0	6
Boustead Holdings Berhad	0.1889	0	0	6
UEM Sunrise Berhad	0.1889	0	0	6
UEM Edgenta	0.1889	0	0	6
MRCB	0.1889	0	0	6
MMC Corporation Bhd.	0.1889	0	0	6
HEITECH PADU Bhd.	0.1889	0	0	6
PHARMANIAGA BERHAD	0.1889	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.1889	0	0	6
BINA DARULAMAN BERHAD	0.1889	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.1889	0	0	6
TDM BERHAD	0.1889	0	0	6
IHH Healthcare Berhad	0.1889	0	0	6
Petronas Dagangan	0.1889	0	0	6
Time Dotcom Berhad	0.1889	0	0	6
MISC Berhad	0.1889	0	0	6

1st difference: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNGDP)
Date: 03/15/21 Time: 01:38
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	129.860	0.0000
ADF - Choi Z-stat	-7.34714	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNGDP)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.0668	0	0	5
Axiata Group Berhad	0.0668	0	0	5
Telekom Malaysia Bhd	0.0668	0	0	5
Malaysia Airport Bhd	0.0668	0	0	5
UMW Holdings Berhad	0.0668	0	0	5
MBSB	0.0668	0	0	5
TH Plantations Berhad	0.0668	0	0	5
Pasdec Holdings Berhad	0.0668	0	0	5
Theta Edge Berhad	0.0668	0	0	5
Boustead Holdings Berhad	0.0668	0	0	5
UEM Sunrise Berhad	0.0668	0	0	5
UEM Edgenta	0.0668	0	0	5
MRCB	0.0668	0	0	5
MMC Corporation Bhd.	0.0668	0	0	5
HEITECH PADU Bhd.	0.0668	0	0	5
PHARMANIAGA BERHAD	0.0668	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.0668	0	0	5
BINA DARULAMAN BERHAD	0.0668	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.0668	0	0	5
TDM BERHAD	0.0668	0	0	5
IHH Healthcare Berhad	0.0668	0	0	5
Petronas Dagangan	0.0668	0	0	5
Time Dotcom Berhad	0.0668	0	0	5
MISC Berhad	0.0668	0	0	5

1st difference: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNGDP)
Date: 03/15/21 Time: 01:39
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	57.4699	0.1644
ADF - Choi Z-stat	-2.54072	0.0055

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNGDP)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.3020	0	0	5
Axiata Group Berhad	0.3020	0	0	5
Telekom Malaysia Bhd	0.3020	0	0	5
Malaysia Airport Bhd	0.3020	0	0	5
UMW Holdings Berhad	0.3020	0	0	5
MBSB	0.3020	0	0	5
TH Plantations Berhad	0.3020	0	0	5
Pasdec Holdings Berhad	0.3020	0	0	5
Theta Edge Berhad	0.3020	0	0	5
Boustead Holdings Berhad	0.3020	0	0	5
UEM Sunrise Berhad	0.3020	0	0	5
UEM Edgenta	0.3020	0	0	5
MRCB	0.3020	0	0	5
MMC Corporation Bhd.	0.3020	0	0	5
HEITECH PADU Bhd.	0.3020	0	0	5
PHARMANIAGA BERHAD	0.3020	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.3020	0	0	5
BINA DARULAMAN BERHAD	0.3020	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.3020	0	0	5
TDM BERHAD	0.3020	0	0	5
IHH Healthcare Berhad	0.3020	0	0	5
Petronas Dagangan	0.3020	0	0	5
Time Dotcom Berhad	0.3020	0	0	5
MISC Berhad	0.3020	0	0	5

ROA
Level: Individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: LNROA
Date: 03/12/21 Time: 01:22
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total number of observations: 106
Cross-sections included: 21 (3 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	38.7230	0.6156
ADF - Choi Z-stat	0.04362	0.5174

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNROA

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.4612	0	0	4
Axiata Group Berhad	0.6118	0	0	4
Telekom Malaysia Bhd	0.2785	0	0	4
Malaysia Airport Bhd	0.4279	0	0	6
UMW Holdings Berhad	0.7216	0	0	3
MBSB	0.4231	0	0	6
TH Plantations Berhad	0.1456	0	0	4
Pasdec Holdings Berhad		Dropped from Test		
Theta Edge Berhad	0.8153	0	0	6
Boustead Holdings Berhad	0.4307	0	0	4
UEM Sunrise Berhad	0.4000	0	0	6
UEM Edgenta	0.0595	0	0	6
MRCB	0.9761	0	0	5
MMC Corporation Bhd.	0.4439	0	0	6
HEITECH PADU Bhd.		Dropped from Test		
PHARMANIAGA BERHAD	0.7758	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.4008	0	0	6
BINA DARULAMAN BERHAD	0.4704	0	0	3
CHEMICAL COMPANY OF MALAYSIA BERHAD		Dropped from Test		
TDM BERHAD	0.7668	0	0	4
IHH Healthcare Berhad	0.7601	0	0	6
Petronas Dagangan	0.3803	0	0	6
Time Dotcom Berhad	0.0259	0	0	6
MISC Berhad	0.8593	0	0	6

Level: Individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: LNROA
Date: 03/12/21 Time: 01:23
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total number of observations: 100
Cross-sections included: 19 (5 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	34.5846	0.6282
ADF - Choi Z-stat	-0.00653	0.4974

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNROA

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.0548	0	0	4
Axiata Group Berhad	0.3256	0	0	4
Telekom Malaysia Bhd	0.9373	0	0	4
Malaysia Airport Bhd	0.7581	0	0	6
UMW Holdings Berhad		Dropped from Test		
MBSB	0.7986	0	0	6
TH Plantations Berhad	0.4429	0	0	4
Pasdec Holdings Berhad		Dropped from Test		
Theta Edge Berhad	0.4180	0	0	6
Boustead Holdings Berhad	0.8153	0	0	4
UEM Sunrise Berhad	0.6228	0	0	6
UEM Edgenta	0.2394	0	0	6
MRCB	0.8441	0	0	5
MMC Corporation Bhd.	0.5594	0	0	6
HEITECH PADU Bhd.		Dropped from Test		
PHARMANIAGA BERHAD	0.2319	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.5934	0	0	6
BINA DARULAMAN BERHAD		Dropped from Test		
CHEMICAL COMPANY OF MALAYSIA BERHAD		Dropped from Test		
TDM BERHAD	0.5881	0	0	4
IHH Healthcare Berhad	0.0628	0	0	6
Petronas Dagangan	0.6501	0	0	6
Time Dotcom Berhad	0.1741	0	0	6
MISC Berhad	0.5000	0	0	6

1st difference: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNROA)
Date: 03/12/21 Time: 01:24
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total number of observations: 81
Cross-sections included: 19 (5 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	67.7497	0.0021
ADF - Choi Z-stat	-3.56612	0.0002

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNROA)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.0223	0	0	3
Axiata Group Berhad	0.1615	0	0	3
Telekom Malaysia Bhd	0.7883	0	0	3
Malaysia Airport Bhd	0.3677	0	0	5
UMW Holdings Berhad		Dropped from Test		
MBSB	0.2977	0	0	5
TH Plantations Berhad	0.2346	0	0	3
Pasdec Holdings Berhad		Dropped from Test		
Theta Edge Berhad	0.1978	0	0	5
Boustead Holdings Berhad	0.4757	0	0	3
UEM Sunrise Berhad	0.1338	0	0	5
UEM Edgenta	0.0412	0	0	5
MRCB	0.6440	0	0	4
MMC Corporation Bhd.	0.3515	0	0	5
HEITECH PADU Bhd.		Dropped from Test		
PHARMANIAGA BERHAD	0.1336	0	0	4
BINTULU PORT HOLDINGS BERHAD	0.2098	0	0	5
BINA DARULAMAN BERHAD		Dropped from Test		
CHEMICAL COMPANY OF MALAYSIA BERHAD		Dropped from Test		
TDM BERHAD	0.3302	0	0	3
IHH Healthcare Berhad	0.0233	0	0	5
Petronas Dagangan	0.0942	0	0	5
Time Dotcom Berhad	0.0390	0	0	5
MISC Berhad	0.2866	0	0	5

1st difference: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNROA)
Date: 03/12/21 Time: 01:24
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total number of observations: 63
Cross-sections included: 13 (11 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	32.0111	0.1928
ADF - Choi Z-stat	-1.65034	0.0494

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNROA)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd		Dropped from Test		
Axiata Group Berhad		Dropped from Test		
Telekom Malaysia Bhd		Dropped from Test		
Malaysia Airport Bhd	0.3902	0	0	5
UMW Holdings Berhad		Dropped from Test		
MBSB	0.2640	0	0	5
TH Plantations Berhad		Dropped from Test		
Pasdec Holdings Berhad		Dropped from Test		
Theta Edge Berhad	0.6264	0	0	5
Boustead Holdings Berhad		Dropped from Test		
UEM Sunrise Berhad	0.3166	0	0	5
UEM Edgenta	0.2204	0	0	5
MRCB	0.3845	0	0	4
MMC Corporation Bhd.	0.6824	0	0	5
HEITECH PADU Bhd.		Dropped from Test		
PHARMANIAGA BERHAD	0.4910	0	0	4
BINTULU PORT HOLDINGS BERHAD	0.3889	0	0	5
BINA DARULAMAN BERHAD		Dropped from Test		
CHEMICAL COMPANY OF MALAYSIA BERHAD		Dropped from Test		
TDM BERHAD		Dropped from Test		
IHH Healthcare Berhad	0.1237	0	0	5
Petronas Dagangan	0.0662	0	0	5
Time Dotcom Berhad	0.1744	0	0	5
MISC Berhad	0.3475	0	0	5

State ownership
Level: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: LNSTATEOWNERSHIP
Date: 03/12/21 Time: 01:25
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	42.0063	0.7158
ADF - Choi Z-stat	NA	

Test statistic value of 'NA' due to the present of a p-value of one or zero
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNSTATEOWNERSHIP

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.4534	0	0	6
Axiata Group Berhad	0.2764	0	0	6
Telekom Malaysia Bhd	0.8098	0	0	6
Malaysia Airport Bhd	0.5822	0	0	6
UMW Holdings Berhad	0.7290	0	0	6
MBSB	0.6169	0	0	6
TH Plantations Berhad	0.9805	0	0	6
Pasdec Holdings Berhad	0.9193	0	0	6
Theta Edge Berhad	1.0000	0	0	6
Boustead Holdings Berhad	0.4638	0	0	6
UEM Sunrise Berhad	0.1651	0	0	6
UEM Edgenta	0.0001	0	0	6
MRCB	0.5221	0	0	6
MMC Corporation Bhd.	0.5409	0	0	6
HEITECH PADU Bhd.	1.0000	0	0	6
PHARMANIAGA BERHAD	0.3968	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.6870	0	0	6
BINA DARULAMAN BERHAD	1.0000	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.8322	0	0	6
TDM BERHAD	0.6000	0	0	6
IHH Healthcare Berhad	0.9579	0	0	6
Petronas Dagangan	0.5076	0	0	6
Time Dotcom Berhad	0.4807	0	0	6
MISC Berhad	0.4586	0	0	6

Level: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: LNSTATEOWNERSHIP
Date: 03/12/21 Time: 01:26
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 144
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	50.4309	0.3776
ADF - Choi Z-stat	NA	

Test statistic value of 'NA' due to the present of a p-value of one or zero
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results LNSTATEOWNERSHIP

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.9768	0	0	6
Axiata Group Berhad	0.1035	0	0	6
Telekom Malaysia Bhd	0.0604	0	0	6
Malaysia Airport Bhd	0.7357	0	0	6
UMW Holdings Berhad	0.4089	0	0	6
MBSB	0.7488	0	0	6
TH Plantations Berhad	0.9997	0	0	6
Pasdec Holdings Berhad	0.6813	0	0	6
Theta Edge Berhad	1.0000	0	0	6
Boustead Holdings Berhad	0.8740	0	0	6
UEM Sunrise Berhad	0.2364	0	0	6
UEM Edgenta	0.0001	0	0	6
MRCB	0.8705	0	0	6
MMC Corporation Bhd.	0.4817	0	0	6
HEITECH PADU Bhd.	0.9999	0	0	6
PHARMANIAGA BERHAD	0.6739	0	0	6
BINTULU PORT HOLDINGS BERHAD	0.6982	0	0	6
BINA DARULAMAN BERHAD	1.0000	0	0	6
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.3620	0	0	6
TDM BERHAD	0.2291	0	0	6
IHH Healthcare Berhad	0.9081	0	0	6
Petronas Dagangan	0.1163	0	0	6
Time Dotcom Berhad	0.6690	0	0	6
MISC Berhad	0.5003	0	0	6

1st difference: individual intercept

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNSTATEOWNERSHIP)
Date: 03/12/21 Time: 01:27
Sample: 2013 2019
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	75.2063	0.0073
ADF - Choi Z-stat	NA	

Test statistic value of 'NA' due to the present of a p-value of one or zero
** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNSTATEOWNERSHIP)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.7999	0	0	5
Axiata Group Berhad	0.0252	0	0	5
Telekom Malaysia Bhd	0.0187	0	0	5
Malaysia Airport Bhd	0.3805	0	0	5
UMW Holdings Berhad	0.1672	0	0	5
MBSB	0.4612	0	0	5
TH Plantations Berhad	0.9609	0	0	5
Pasdec Holdings Berhad	0.4687	0	0	5
Theta Edge Berhad	1.0000	0	0	5
Boustead Holdings Berhad	0.7302	0	0	5
UEM Sunrise Berhad	0.1333	0	0	5
UEM Edgenta	0.0001	0	0	5
MRCB	0.4543	0	0	5
MMC Corporation Bhd.	0.2683	0	0	5
HEITECH PADU Bhd.	0.9961	0	0	5
PHARMANIAGA BERHAD	0.3323	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.3168	0	0	5
BINA DARULAMAN BERHAD	1.0000	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.1708	0	0	5
TDM BERHAD	0.2094	0	0	5
IHH Healthcare Berhad	0.5084	0	0	5
Petronas Dagangan	0.0355	0	0	5
Time Dotcom Berhad	0.5515	0	0	5
MISC Berhad	0.2123	0	0	5

1st difference: individual intercept and trend

Null Hypothesis: Unit root (individual unit root process)
Series: D(LNSTATEOWNERSHIP)
Date: 03/12/21 Time: 01:27
Sample: 2013 2019
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 120
Cross-sections included: 24

Method	Statistic	Prob.**
ADF - Fisher Chi-square	44.6582	0.6106
ADF - Choi Z-stat	NA	

Test statistic value of 'NA' due to the present of a p-value of one or zero
** Probabilities for Fisher tests are computed using an asymptotic Chi
-square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(LNSTATEOWNERSHIP)

Cross section	Prob.	Lag	Max Lag	Obs
FGV Holdings Bhd	0.8202	0	0	5
Axiata Group Berhad	0.1615	0	0	5
Telekom Malaysia Bhd	0.1226	0	0	5
Malaysia Airport Bhd	0.7469	0	0	5
UMW Holdings Berhad	0.4630	0	0	5
MBSB	0.7958	0	0	5
TH Plantations Berhad	0.9593	0	0	5
Pasdec Holdings Berhad	0.8314	0	0	5
Theta Edge Berhad	1.0000	0	0	5
Boustead Holdings Berhad	0.8980	0	0	5
UEM Sunrise Berhad	0.4182	0	0	5
UEM Edgenta	0.0001	0	0	5
MRCB	0.6519	0	0	5
MMC Corporation Bhd.	0.4560	0	0	5
HEITECH PADU Bhd.	0.9438	0	0	5
PHARMANIAGA BERHAD	0.7446	0	0	5
BINTULU PORT HOLDINGS BERHAD	0.6751	0	0	5
BINA DARULAMAN BERHAD	1.0000	0	0	5
CHEMICAL COMPANY OF MALAYSIA BERHAD	0.5175	0	0	5
TDM BERHAD	0.4875	0	0	5
IHH Healthcare Berhad	0.3875	0	0	5
Petronas Dagangan	0.2610	0	0	5
Time Dotcom Berhad	0.8739	0	0	5
MISC Berhad	0.4770	0	0	5