RELATIONSHIP BETWEEN GROWTH, PROFITABILITY AND STOCK RETURNS AMONGST THE NON-FINANCIAL COMPANIES LISTED ON FTSE BURSA MALAYSIA KLCI

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ABSTRACT

Based on the Signaling Theory, strong financial performance exhibited by public-listed companies will convey positive signals about the companies' future financial performance. Investors would respond to the positive signals by increasing the demand for the companies' stocks, which in turn drives up the stock prices of those companies. This study has examined whether stock returns would respond to signals conveyed by revenue growth, earnings growth, and changes in profitability. The sample involved in this study amounted to 22 non-financial companies listed on the FTSE Bursa Malaysia KLCI from 2013 to 2019. The panel data regressions were used to analyse the relationship between stock returns, revenue growth, earnings growth, and changes in profitability. The results indicated that only earnings growth convey meaningful signals that influence stock returns. On the other hand, revenue growth and changes in profitability are unable explain the variation in stock returns amongst the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

Keyword: Stock Returns, Revenue Growth, Earning Growth, Changes in Profitability, Signaling Theory, FTSE Bursa Malaysia KLCI

ABSTRAK

Menurut teori isyarat, syarikat-syarikat awam yang mempamerkan prestasi kewangan yang baik akan menyampaikan isyarat-isyarat yang positif mengenai prestasi kewangan masa depan syarikat-syarikat tersebut. Sehubungan itu, pelabur-pelabur akan bertindak balas terhadap isyarat-isyarat positif tersebut dengan meningkatan permintaan terhadap saham syarikat-syarikat tersebut, dan dengan demikian, menyebabkan kenaikkan harga saham syarikat-syarikat tersebut. Kajian ini telah meneliti tindak balas pulangan saham terhadap isyarat-isyarat yang disampaikan oleh pertumbuhan hasil, pertumbuhan pendapatan bersih, dan perubahan kenuntungan. Sampel yang terlibat dalam kajian ini merangkumi 22 buah syarikat-syarikat bukan kewangan yang tersenarai di FTSE Bursa Malaysia KLCI dari tahun 2013 hingga 2019. Regresi data panel telah digunakan dalam kajian ini untuk menganalisis hubungan antara pulangan saham, pertumbuhan hasil, pertumbuhan pendapatan bersih, dan perubahan keuntungan. Hasil kajian ini menunjukkan bahawa hanya pertumbuhan pendapatan bersih sahaja yang mampu memberikan isyarat-isyarat bermakna yang dapat mempengaruhi pulangan saham. Sementara itu, pertumbuhan hasil dan perubahan keuntungan tidak dapat menjelaskan variasi pulangan saham anatara syarikat-syarikat bukan kewangan yang tersenarai di FTSE Bursa Malaysia KLCI.

Kata Kunci: Pulangan Saham, Pertumbuhan Hasil, Pertumbuhan Pendapatan Bersih, Perubahan Keuntungan, Teori Isyarat, FTSE Bursa Malaysia KLCI

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APT	Arbitrage Pricing Model
BPLM	Breusch-Pagan Lagrange Multiplier
CAPM	Capital Asset Pricing Model
COVID-19	Coronavirus Disease 2019
EPF	Employees Provident Fund
GLIC	Government-Linked Investment Companies
GMM	Generalized Method of Moments
KLCI	Kuala Lumpur Composite Index
LTAT	Armed Forces Fund Board
OLS	Ordinary Least Squares
PNB	Permodalan Nasional Berhad
RESET	Regression Equation Specification Error Test

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CHAPTER 1: INTRODUCTION

1.0 Introduction

The purpose of this study is to analyze the influence of revenue growth, earnings growth, and changes in profitability towards the stock returns of non-financial companies listed on the FTSE Bursa Malaysia Kuala Lumpur Composite Index (KLCI). This chapter sets out the background of study, problem statement, research questions and objectives, scope and significance of study, definition of key terms, as well as the organization of this project paper.

1.1 Background of Study

Common stocks, also known as common shares, represent the share of ownership among the investors of a public-listed company (Subramanyam, 2014). Generally, common stocks provide investors with the rights to receive dividends, claim on company assets, and vote in shareholder meetings of a particular public-listed company (Ross, Westerfield, Jaffe, 2013). However, the extent to which an investor can exercise his/her ownership rights is proportional to the amount of common stocks owned by the investor. Therefore, any investors who wished to exercise greater ownership rights over a company will have to acquire more common stocks from other investors at a mutually agreed price. The ultimate goal of a stock investor is to receive financial returns from investing in common stocks, either in the form of dividends or stock price appreciation (Olweny, 2011).

Stock prices fluctuate from one period to another due to the influence of various economic and firm-specific factors (Rjoub, Civcir, and Resatoglu, 2017). A convenient way to gauge the overall stock price performance is through observing stock market indices, which contain a representative sample of common stocks from a particular stock market or region (Reiley and Brown, 2012). The FTSE All-World Index summarizes the stock price performance of 3,949 public-listed companies around the world and serves as the general representation of global stock price movements (FTSE Russell, 2021a). Alternatively, the MSCI World Index generalizes the overall stock price performance of 1,600 stocks across 23 developed economies, and is the representative stock market index of developed countries (MSCI Inc., 2020). In Malaysia, the representative stock market index is the FTSE Bursa Malaysia KLCI, which contains 30 of the largest public-listed companies in the country (FTSE Russell, 2021b).

Based on Figure 1.1, stock prices around the world (as represented by FTSE All-World Index) and in developed countries (as represented by MSCI World Index) have experienced an overall uptrend over the past five years. On the other hand, stock prices in Malaysia (as represented by FTSE Bursa Malaysia KLCI) exhibited a flattish trend during the same period (refer to Figure 1.1). Recently in 2020, the price movements of international and domestic stocks were subjected to heightened volatility due to uncertainty and worsening corporate earnings outlook stemming from the COVID-19 pandemic (Securities Commission Malaysia, 2021). Based on the stock price performance in the Malaysian and international context, it is interesting to study the factors that influence stock returns. According to Ahmadi and Bouri (2018), stock returns were driven by accounting information contained in financial statements such as earnings and book value of equity.

Besides, information that conveys the financial performance of public-listed companies may also influence the stock returns of those companies. Stock returns may also reflect the degree of indebtedness and profitability of a company (Ligocká and Stavárek, 2019). Thus, this study attempts to investigate whether the stock returns of Malaysian public-listed companies are influenced by the information on financial performance.

1.2 Problem Statement

Weak stock returns in Malaysia can have widespread impact to the country and its citizen. Lackluster stock returns have shown to negatively affect the ability of government-linked investment companies (GLICs) in Malaysia to generate sufficient returns for savers and pension fund holders. In 2019, the Employees Provident Fund (EPF) only managed to issue a dividend of 5.45 percent to the conventional account holders, which was the lowest since 2008 (The Edge Markets, 2020). According to the former Chief Executive Officer of EPF, Tunku Alizakri Alias, the low dividends issued in 2019 was mainly attributed to the poor investment income generated from the weak Malaysian stock market (Employees Provident Fund, 2020).

Besides the EPF, the poor stock returns environment in Malaysia has also negatively affected the dividends issued by other GLICs. The Armed Forces Fund Board (LTAT) has only issued a dividend of 2.5 percent in 2019 due to the challenging local stock market condition (Vasu, 2020). Similarly, Permodalan Nasional Berhad (PNB) announced a dividend of 5.5 sen per unit in 2019, which was the lowest distribution payout since 1990 (Zahiid, 2019). The former Chairman of PNB, Tan Sri Zeti Akhtar Aziz, attributed the low distribution payout to the challenging condition in the domestic stock market (The Star, 2019).

Weak domestic stock returns may also negatively impact the revenue of the Malaysian Government. In 2018, Khazanah Nasional Berhad failed to achieve its RM2 billion dividend target needed by the Government of Malaysia (Kana, 2019). The former Managing Director of Khazanah Nasional, Datuk Shahril Ridzuan, explained that the lower dividends were largely caused by investment losses attributable to the poorly performing local stock market (Toh, 2019).

Overall, the weak stock returns environment in Malaysia has negatively affected the ability of GLICs to generate investment income in the past few years. This has resulted in the GLICs issuing smaller dividends, which in turn has led to lower returns on the retirement funds and savings belonging to the average working Malaysians as well as lower revenue to the Malaysian Government (for the case of Khazanah Nasional Berhad). However, although the managers of GLICs have reasoned that the lower dividends were caused by weak stock returns in Malaysia, none of them have indicated the sources that have created the environment of weak stock returns.

The movements of stock returns can be attributed to a wide variety of influences ranging from company-specific factors to exogenous macroeconomic impacts. In February to March 2020, major stock market indices around the world has fell due to the initial outbreak of the COVID-19 pandemic (Liu, Manzoor, Wang, Zhang, and Manzoor, 2020). In a similar fashion, the stock prices of companies listed across all sectors of Bursa

Malaysia (with the exception of the Plantation sector) yielded negative returns as COVID-19 cases continued to rise in the country (Lee, Jais, and Chan, 2020).

Figure 1.1 illustrates the trends of selected stock market indices from January 2016 to January 2021. Based on Figure 1.1, it is observed that global stock prices (as indicated by the FTSE All-World Index) have shown an overall uptrend from 2016 to 2020. During the same period, stock prices in developed countries (as shown by the MSCI World Index) have showed an upward movement similar to global stock prices. Only the stock prices in Malaysia have bucked international markets trend, in which the FTSE Bursa Malaysia KLCI trended in a flattish manner over the last five year.

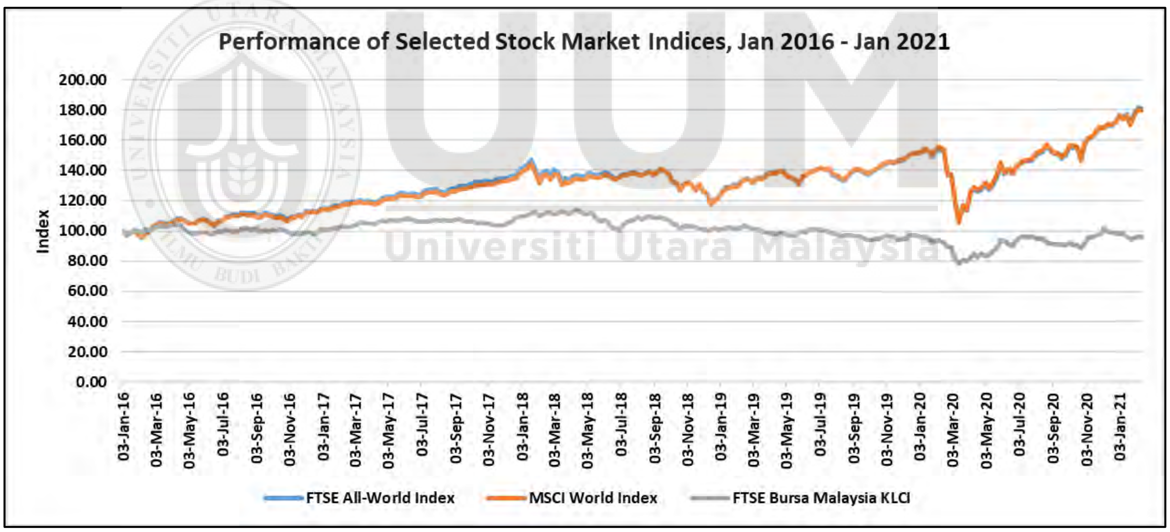

Figure 1.1
Performance of Selected Stock Market Indices, January 2016 to January 2021
Note: The base period of all indices have been readjusted to begin on 3 January 2016.
Source: Author’s illustration based on indices data obtained from Investing.com

Interestingly, all three stock market indices crashed in unison during March 2020 due to the outbreak of the COVID-19 pandemic (Liu et al., 2020). Following the crash, stock prices in Malaysia and across the globe posted positive returns for the rest of 2020. Despite the recovery in stock prices, the FTSE Bursa Malaysia KLCI has generated lackluster returns as compared to the other stock market indices (Figure 1.1).

The decline in global stock prices (i.e. negative stock returns) in early 2020 was the result of widespread fear and strict quarantine measures that brought the global economy into a standstill. Stock returns reflect the expected trends of future corporate revenue and earnings, and the negative economic outlook instigated by the pandemic has prompted a stock market downturn as investors turned bearish on future corporate performances (Liu et al., 2020).

Beginning from the second quarter of 2020, global stock market indices have turned bullish. From April to June 2020, the MSCI World Index increased by 19.4 percent (Schroders plc, 2020). For the entire year of 2020, global stock markets have yielded positive returns, in which the MSCI World Index posted a 14.1 percent gain (Cooper, 2020). In Malaysia, the FTSE Bursa Malaysia KLCI gained 2.4 percent for the year of 2020, which was weaker than global stock market trends (Securities Commission Malaysia, 2021).

However, the positive returns exhibited by stock markets around the globe and in Malaysia were not accompanied by the corresponding rise in corporate revenue, earnings or profitability. According to a report by Bridgewater Associates, a hedge fund based in the U.S., global corporate revenue was expected to fall by USD12 trillion in 2020 due to the COVID-19 pandemic (Wadhwa, 2020). According to Hung, Ha, and Binh (2018), revenue is one of the relevant accounting information reflected in stock prices. Therefore, the fall in revenue during the pandemic should have been followed by the concurrent decline in stock returns. Yet, this was not the case during the COVID-19 pandemic.

The rise in global and domestic stock market indices also did not reflect the decreasing trend of corporate earnings in 2020. According to an analysis by JPMorgan, the COVID-19 pandemic has negatively influenced global corporate earnings, which fell by 33 percent during the second quarter of 2020 (Winck, 2020). During that period, corporate earnings in developed markets fell by 45 percent, whereas corporate earnings in emerging markets declined by 23 percent (Winck, 2020). In Malaysia, business disruptions caused by the COVID-19 pandemic have resulted in the fall of corporate earnings by 70 percent during the second quarter of 2020 (Securities Commission Malaysia, 2021). According to Gschwandtner and Hauser (2016), lower corporate earnings should have led to lower stock returns. This is because companies with poor earnings growth will convey signals that suggest the stock prices of those companies will decrease in the future (Mirza, Malek and Abdul-Hamid, 2019).

Beyond the revenue and earnings of a company, profitability is also reflected in stock returns. Generally, highly profitable companies should experience increasing stock prices as they are more likely to create value to shareholders (Narayan and Reddy, 2018). According to Shen, Fu, Pan, Yu and Chen (2020), the COVID-19 pandemic has resulted in the decline of profit margins among Chinese companies, especially for companies that experienced decreasing revenue. Despite the lackluster financial performance of Chinese companies amidst the pandemic in 2020, the Shanghai Composite Index and Shenzhen component index gained 13.87 percent and 38.73 percent, respectively, during the year (Huang, 2020). This phenomenon has contradicted the notion that lower profitability will lead to lower stock returns (Sitorus and Elinarty, 2017).

Based on the importance of stock returns in Malaysia, and the disconnection observed between stock returns and financial performance of public-listed companies around the world and in Malaysia during the COVID-19 pandemic, there is a need to examine whether financial performance such as revenue growth, earnings growth, and changes in profitability are reflected in stock returns.

1.3 Research Questions

The research questions to be addressed in this study are as follows:

1. Is there any relationship between revenue growth and stock returns among the non-financial companies listed on FTSE Bursa Malaysia KLCI?
2. Is there any relationship between earnings growth and stock returns among the non-financial companies listed on FTSE Bursa Malaysia KLCI?
3. Is there any relationship between the changes in profitability and stock returns among the non-financial companies listed on f FTSE Bursa Malaysia KLCI?

1.4 Research Objectives

This study aims to analyze the effects of revenue growth, earnings growth, and changes in profitability towards the stock returns of non-financial companies listed on the FTSE Bursa Malaysia KLCI. The following research objectives are formulated to address the research questions of this study:

1. To investigate the relationship between revenue growth and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

2. To examine the relationship between earnings growth and stock returns among the non-financial companies listed on FTSE Bursa Malaysia KLCI.

3. To analyze the relationship between the changes in profitability and stock returns among the non-financial companies listed on FTSE Bursa Malaysia KLCI.

1.5 Research Scope

The scope of this study focuses on the non-financial public-listed companies in the Malaysian stock market. There are 901 non-financial companies listed in the Malaysian stock market as at 30 March 2021, with a total market capitalization of RM1.48 trillion (Bursa Malaysia Berhad, 2021a, 2021b). In this study, financial companies are excluded from the population as per the standard practices of corporate finance research. The justifications for excluding financial companies from the population is elaborated in Chapter 3.

The initial sample of this study was restricted to all non-financial companies listed on the FTSE Bursa Malaysia KLCI from 2013 to 2019. The FTSE Bursa Malaysia KLCI consists of 24 of the largest non-financial companies in Malaysia by market value, which represents about 50 percent[1] of the entire Malaysian stock market capitalization as at 30 March 2021 (Bursa Malaysia Berhad, 2021a; MalaysiaStock.biz, 2021). Thus, the FTSE Bursa Malaysia KLCI is considered as a representative benchmark to gauge the overall performance of the Malaysian stock market (Yacob, Mahdzan, and Arof, 2016). Based on the representativeness of the FTSE Bursa Malaysia KLCI to the overall Malaysian stock market, the non-financial companies listed on the FTSE Bursa Malaysia KLCI are selected as the initial sample of this study. The justifications for the sampling frame and period chosen are provided in Chapter 3.

[1] Author's calculation based on information provided by Bursa Malaysia Berhad (2021a) and MalaysiaStock.biz (2021).

1.6 Significance of Study

The outcome of this study delivers both theoretical as well as practical contributions to the field of stock returns analysis.

In terms of theoretical contribution, the findings of this study would add on to the existing literature on the factors affecting the stock returns. This study also provides statistical evidence that helps to determine which financial performance variables can significantly affect stock returns.

On practical contributions, the findings of this study should assist corporate finance practitioners in selecting financial performance indicators that have meaningful influence on stock returns. This will allow the managers of public-listed companies to formulate more effective financial performance targets that can contribute positively to shareholder value creation.

Moreover, this study also helps investors and equity analysts in choosing suitable financial performance yardsticks to evaluate stock returns, which will aid in the process of equity analysis.

1.7 Definition of Key Terms

1.7.1 Stock Returns

Stock returns are defined as the rate of change of stock prices over a particular period of time (Brahma, 2018). Stock price refers to the market value per share of a public-listed company (Reiley and Brown, 2012).

1.7.2 Revenue Growth

Revenue growth is the rate of change of revenue over time (Puspitaningtyas, 2017). Revenues are the inflows received by a company, either in the form of cash or claim on payment, for the provision of goods or services (Subramanyam, 2014).

1.7.3 Earnings Growth

Earnings growth refers to the change in earnings over time (Ayundhasurya and Murtaqi, 2012). Earnings, also known as profit or net income, is the net financial gains generated from the operations of a company over a financial period (Subramanyam, 2014,).

1.7.4 Changes in Profitability

Changes in profitability refer to the growth in profitability over a particular period (Lim, Sotes-Paladino, Wang, and Yao, 2021). Profitability measures the efficiency of a company in generating income from its assets and operations. (Ross, Westerfield, and Jafffe, 2013). The typical metrics for profitability include profit margins, return on assets, return on invested capital, and return on equity.

1.8 Organization of Study

This project paper is organized into five chapters. Chapter 1 outlines the background, problem statement, research questions and objectives, scope and significance of study, and the definition of key terms. Chapter 2 presents the literature review on previous studies as well as the underpinning theory on the relationship between stock returns, revenue growth, earnings growth, and changes in profitability. Chapter 3 discusses the methodology, which covers the conceptual framework, population frame, sample, variables, and data analysis technique employed in this study. Chapter 4 presents the findings of this study as well as the accompanying discussions. Finally, Chapter 5 concludes this study based on the research findings and discussions, and provides the recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

The previous literature that studied the relationship between revenue growth, earnings growth, changes in profitability and stock returns are reviewed in this chapter.

2.1 Stock Returns

Research on stock returns is an area of interest for stock investors and academicians alike. Arguably, the theory on stock returns prediction began with the development of Modern Portfolio Theory by Markowitz (1952). The Modern Portfolio Theory conceptualized the opportunity cost between expected returns and risk of an asset portfolio (Markowitz, 1952). Building upon the work of Markowitz (1952), Sharpe (1964) developed the Capital Asset Pricing Model (CAPM), which established that stock returns take into account factors of risk-free rate of return, stock price risk, and the overall stock market returns.

Following the CAPM model, Ross (1976) introduced the Arbitrage Pricing Theory (APT) model to predict stock returns based on macroeconomic factors. Fama and French (1995) expanded the CAPM to develop the Fama-French Three-Factor Model. In addition to the risk factor captured by CAPM, the Three Factor Model also incorporated firm-specific factors such as firm size and book-to-market value of equity to explain stock returns.

Prior to the work of Ohlson (1995), the theories on stock returns have largely excluded the use of accounting and financial performance data as determinants of stock returns. Ohlson (1995) began studying the use of accounting data to predict stock prices, and developed the residual income model to forecast stock prices based on the sum of excess earnings and book value of equity. Since then, researches have expanded the work of Ohlson (1995) into studies related to firm valuation, earnings management, and the relevance of accounting information to stock prices (Kumari and Mishra, 2017).

Generally, the stock price model and stock returns model are the two main research frameworks used in analyzing the factors affecting stock price performances. The core differences between the two models lie in the specification of the dependent variable. The dependent variable used in the stock price model is stock prices in level form. Thus, the stock price model is best used to study on whether a particular financial variable or information is reflected in stock prices (Barth, Clement, Foster, and Kasznik, 1998; Ota, 2003). On the other hand, the dependent variable used in the stock returns model is the rate of return on stock prices over a particular period. This renders the stock returns model more suitable in studying whether the changes in financial data are related to the variation in stock returns (Hung, 2000; Ota, 2003). However, there are no clear-cut evidence to substantiate the relative superiority between the two models (Landsman and Magliolo, 1988; Ota, 2003). Moreover, the stock price model and stock returns model may yield different results from one another (Harris, Lang, and Moller, 1994). Thus, the choice of model should be based on the research question of the study (Barth, Beaver, and Landsman, 2001).

2.2 Revenue Growth

Jegadeesh and Livnat (2006) analyzed the relationship between revenue growth and stock returns among non-financial and non-utility companies in the U.S. from 1987 to 2003. Through employing the Fama-MacBeth regression, Jegadeesh and Livnat (2006) found that revenue growth has a significant positive effect on stock returns. In another similar study, Chandra and Ro (2008) employed the same research method but used a different sample from that of Jegadeesh and Livnat (2006) to examine the relationship between revenue growth and stock returns. Based on a sample of all active and non-active U.S. firms from 1973 to 2003, Chandra and Ro (2008) also reported that higher revenue growth was reflected in higher stock returns. The authors further reported that the combination of both revenue and earnings growth in a regression was more effective in explaining stock returns than revenue growth alone.

Beyond U.S. companies, further evidences on the significant positive influence of revenue growth on stock returns were also found in other countries. Revenue growth generally exerts a positive impact on stock prices of non-manufacturing firms in India (Srinivasan, 2012). In another study, Zhang (2015) employed the cross-sectional regression analysis to test the relationship between revenue growth and stock returns in China. Based on a sample of 340 firms listed on the Shenzhen stock exchange from 2012 to 2013, Zhang (2015) found that revenue growth has a significant positive relationship with stock returns. Notably, Zhang (2015) also reported that revenue growth was more significant than profitability in predicting stock returns. In the context of Egypt, Saeed, Metawa, and Eldomiaty (2017) also concluded that revenue growth has a significant positive influence on stock prices among the non-financial companies in Egypt.

However, the lack of any meaningful relationship between revenue growth and stock returns was also reported in a few studies. An early study conducted by Lau, Lee and McInish (2002) reported the insignificant impact of revenue growth on stock returns in Malaysia. In another study that employed the Fama-MacBeth regression, Chen, Kim, Yao, and Yu (2010) also found that revenue growth exerts no significant influence on stock returns of firms listed in China and the U.S.. Not only that, Tahir, Sabir, Alam and Islam (2013) found that revenue growth has no significant influence on the stock returns of non-financial firms listed in Pakistan.

Pranata and Pujiati (2015) studied the relationship between revenue growth and stock prices amongst 13 Indonesian companies for the period of 2011 to 2013. Based on the multiple linear regression analysis, Pranata and Pujiati (2015) reported that revenue growth has insignificant effects on stock prices. The findings of Pranata and Pujiati (2015) were supported by that of Puspitaningtyas (2017). Based on the multiple linear regression, Puspitaningtyas (2017) found no evidence to support the existence of any significant relationships between revenue growth and stock prices among the non-banking firms in Indonesia. In another unrelated study involving 26 Indian non-banking firms for the period of 2010 to 2017, Brahma (2018) also concluded the lack of any significant relationships between revenue growth and stock returns.

Overall, the literature provided mixed evidence to substantiate the relationship between revenue growth and stock returns.

2.3 Earnings Growth

Dimitropoulos and Asteriou (2009) analyzed the relationship between earnings and stock returns across 105 Greek firms over a 10-year period from 1994 to 2004. Based on the pooled OLS regression, Dimitropoulos and Asteriou (2009) reported that earnings were significantly related to stock returns.

For the case of Iran, Shabani, Aghaei, and Shabani (2013) confirmed that earnings were significantly related to stock price after analyzing a dataset of 55 Iranian companies from 2000 to 2010. However, the findings Shabani, Aghaei, and Shabani (2013) were contradicted by another study conducted by Vakilifard and Shahmoradi (2014). Based on the panel regression analysis on a dataset of 84 Iranian companies from 2004 to 2012, Vakilifard and Shahmoradi (2014) reported the lack of any significant relationships between earnings growth and stock returns in Iran.

The relationship between earnings and stock returns was found to persist over the long-term. Based on the observations collected from 1742 U.S. firms for the period of 1975 to 2006, Gschwandtner and Hauser (2016) reported that earnings have a positive and significant influence on stock returns over the long run. On the other hand, firms facing financial distress do not exhibit the typical positive relationship between earnings and stock returns. Lee, Glasscock, and Park (2017) reported that firms facing financial distress would exhibit a negative relationship between earnings and stock returns. Lee, Glasscock, and Park (2017) argued that investors would not consider the earnings information released by financially distressed firms as reliable indicators of firm value. As a result, higher earnings were associated with lower stock returns for financially distressed firms.

In the Indonesian context, earnings growth generally have a significant positive influence on stock returns. Atidhira and Yustina (2017) studied the influence of earnings on the stock returns of 35 property and real estate companies listed on the Indonesia Stock Exchange from 2011 to 2014. Based on the multiple regression method, Atidhira and Yustina (2017) concluded that earnings have a significant positive influence on stock returns. The findings of Atidhira and Yustina (2017) were supported by Prayogo and Lestari (2018), who reported that the increase in earnings was associated with stock price appreciation amongst Indonesian banking companies. However, Tikasari and Surjandari (2020) presented contradicting evidence on the significant relationship between earnings and stock returns in Indonesia, in which the authors found that earnings have no influence on the stock returns of Indonesian mining companies.

The relationship between earnings growth and stock prices was also present among non-financial firms in Pakistan. Based on the dataset of 115 Pakistani non-financial firms from 2007 to 2017, Muhammad and Ali (2018) reported that earnings and stock returns were positively related to one another. Mirza, Malek, and Abdul-Hamid (2019) also arrived at a similar conclusion for the case of Malaysia. Mirza, Malek, and Abdul-Hamid (2019) argued that higher earnings were reflected in higher stock prices amongst Malaysian firms because investors rely on earnings as one of the important financial information when making investment decisions.

Based on the surveyed empirical literature that studied on the relationship between earnings growth and stock returns, the findings of past authors generally supported the existence of a significant relationship between earnings growth and stock returns.

2.4 Changes in Profitability

Wijesundera, Weerasinghe, Krishna, Gunawardena, and Peiris (2015) examined the relationship between profitability and stock returns among 60 companies in Sri Lanka for the period of 2004 to 2013. Based on the panel regression analysis, Wijesundera et al. (2015) found that profitability influences stock returns in a positive direction. In another study involving 30 Indonesian banking companies, Sitorus and Elinarty (2017) also reported that stock prices responded positively to increases in profitability. Muhammad and Ali (2018) and Hung, Ha, and Binh (2018) further supported the significant positive relationship between profitability and stock price variation in Pakistan and Vietnam, respectively. For the case of Malaysia, Nakhaei (2018) found that the traditional measurements of profitability such as return on assets and return on equity were able to explain stock returns variation. Ligocká and Stavárek (2019) also found corroborating evidence on the significant relationship between profitability and stock prices amongst European food and beverage companies.

Most recently, Lim, Sotes-Paladino, Wang, and Yao (2021) employed the portfolio sorts and Fama-MacBeth regression to study the association between changes in profitability and stock returns. Based on a sample of US non-financial firms, Lim et al. (2021) reported that the portfolio strategy of investing in firms with high profitability growth and shorting firms with low profitability growth has yielded abnormal returns. However, the abnormal returns from the same portfolio strategy diminishes if the average firm size in the portfolio increases. Further analysis using the Fama-MacBeth regression has also led Lim et al. (2021) to confirm the positive relationship between the changes in profitability and stock returns.

However, Khan, Aleemi, and Qureshi (2016) found that stock prices were not significantly affected by profitability among Pakistani non-financial companies. Ali, Kalim, Raza, Ali, Rehman, and Ullah (2017) also concluded that profitability has no significant influence on the stock prices of Pakistani energy companies for the period of 2006 to 2011. Empirical evidence based on Turkish data has also failed to substantiate any significant relationship between profitability and stock prices. Based on the fixed effects model, Bayrakdaroglu, Mirgen, Kuyu (2017) concluded that profitability has no significant influence on the stock prices of 87 Turkish public-listed companies from 2012 to 2017. Not only that, Musallam (2018) also found the lack of any significant relationship between profitability and changes in stock prices amongst 26 Qatari companies from 2009 to 2015.

Overall, the literature indicated an ambiguous relationship between the changes in profitability and stock returns

2.5 Underpinning Theory

The Signaling Theory was initially developed by Spence (1973) to put forward the signaling effects of education in conveying the work capability of job seekers to prospective employers. Corporate finance researchers adapted the theory to explain the relationship between financial performance and value of companies (i.e. stock price). Based on early studies, Ross (1973) argued that companies with larger debt are more highly valued by investors because the debt conveys positive signals about the ability of the companies to meet debt payment obligations in the future. Similarly, Bhattacharya (1980) adapted the Signaling Theory to explain that investors react positively to companies that announce dividends because it signals that the companies have the necessary financial performance to support the dividend payments.

The three key components of the Signaling Theory are the signaler, the receiver, and the signal (Connelly, Certo, Ireland, and Reutzel, 2011). The signalers are the companies that provide the financial information (Basdeo, Smith, Grimm, Rindova, and Derfus, 2006). On the other hand, the receivers are the existing and potential investors that rely on financial information to make investment decisions (Kang, 2008). Finally, the signals are the financial information conveyed by the signaler (i.e. the companies) to the receiver (i.e. investors (Connelly et al., 2011).

In the context of this study, investors are expected to behave rationally through assessing the financial performance of a company prior to making any investment decision (Ali et al., 2017; Puspitaningtyas, 2017). Thus, the Signaling Theory provides the theoretical framework to explain the role of revenue growth, earnings growth and changes in profitability in providing investors with new signals about the future financial performance of a company. Jegadeesh and Livnat (2006) stated that combined effects of both revenue growth and earnings growth convey stronger signals to investors about the future financial performance of a company than revenue growth or earnings growth alone. Sitorus and Elinarty (2017) also found that the profitability ratio convey meaningful information about a company’s future financial performance. The signaling ability of financial performance metrics would encourage investors to increase the demand for the stocks of companies that exhibit promising future financial performances (Connelly et al., 2011, Tikasari and Surjandari, 2020). Consequently, the increase in investment demand would drive up the stock prices of the companies and thus, contribute to higher stock returns (Mostafa, 2016).

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter discusses on the methodology employed in this study, which include the conceptual framework, hypotheses, research design, operational definition of variables, population frame, sample and sampling techniques, data collecting procedures, and data analysis technique.

3.1 Research Framework

The research frameworks employed by other authors in recent studies are highlighted as follows:

A. Stock Returns Model from Atidhira and Yustina (2017)

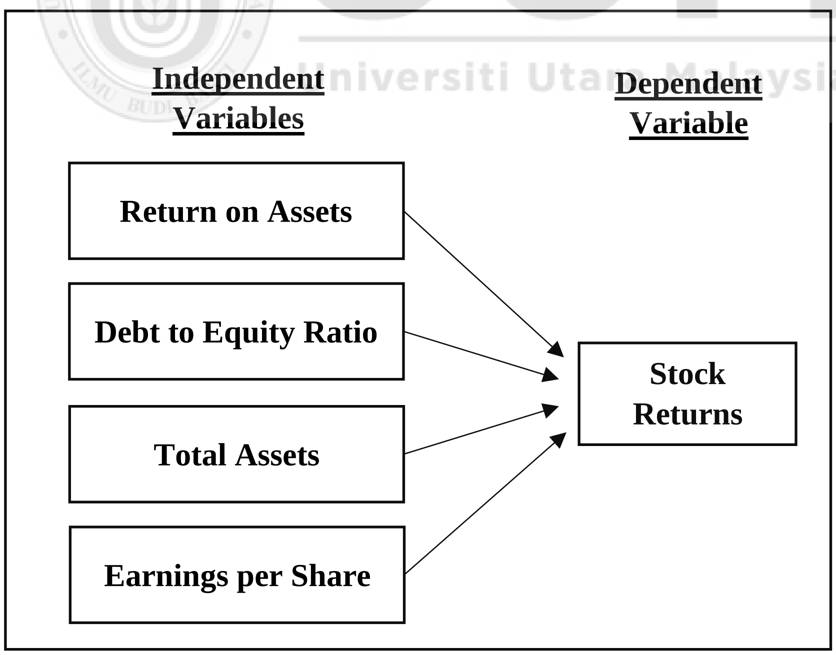

Figure 3.1
Stock Returns Model of Atidhira and Yustina (2017)
Source: Atidhira and Yustina (2017)

Figure 3.1 in the previous page shows the research framework employed by Atidhira and Yustina (2017) to study the relationship between financial performance and stock returns amongst the real estate and property firms listed on the Indonesian Stock Exchange. Atidhira and Yustina (2017) developed the framework based on the Signaling Theory.

B. Stock Returns Model from Saeed, Metawa, and Eldomiaty (2017)

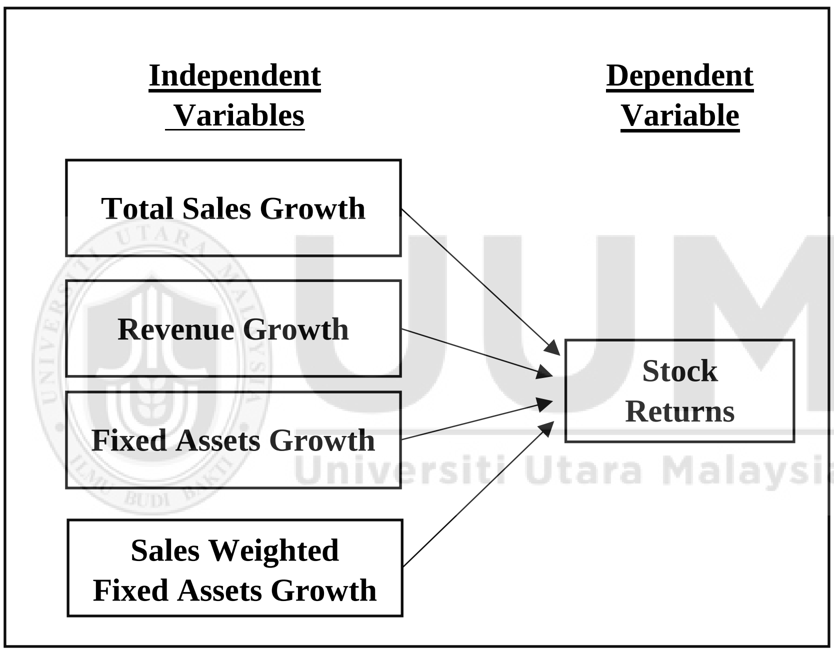

Figure 3.2
Stock Returns Model of Saeed, Metawa, and Eldomiaty (2017)
Source: Saeed, Metawa, and Eldomiaty (2017)

Figure 3.2 above illustrates the research framework employed by Saeed, Metawa, and Eldomiaty (2017) to study the relationship between firm growth and stock returns among the non-financial public-listed companies in Indonesia. Saeed, Metawa, and Eldomiaty (2017) developed the framework based on the Growth-Learning and Growth-Size Theory.

C. Stock Returns Model from Lee, Glassock, and Park (2017)

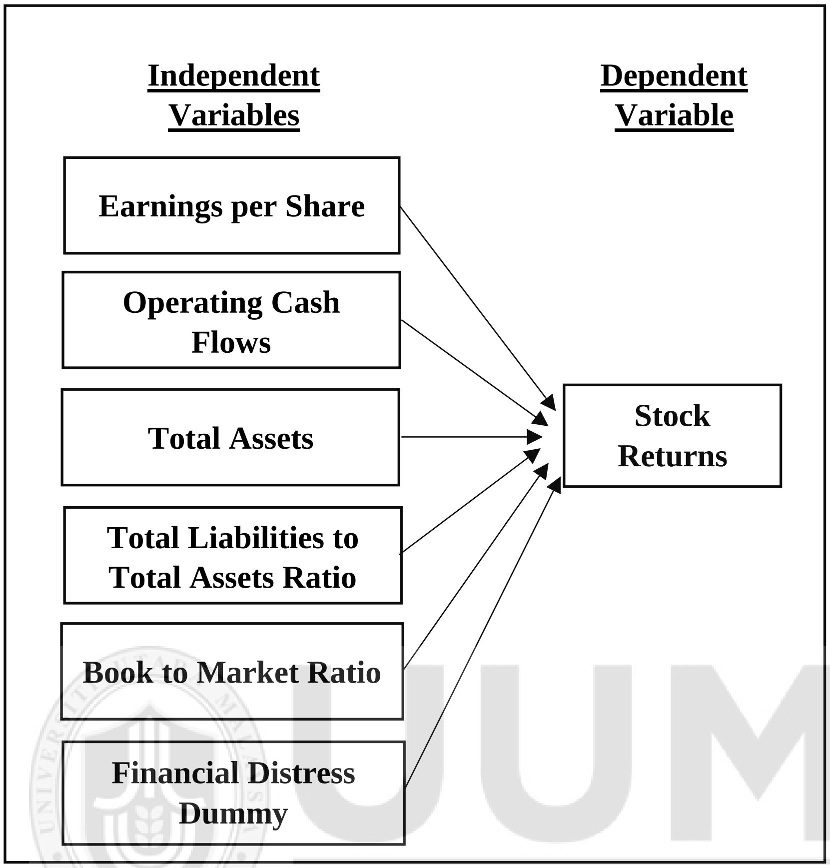

Figure 3.3
Stock Returns Model from Lee, Glassock, and Park (2017)
Source: Lee, Glasscock, and Park (2017)

Figure 3.3 above shows the research framework employed by Lee, Glassock, and Park (2017) to examine the relationship between financial performance and stock returns among all companies listed on the New York Stock Exchange. Lee, Glassock, and Park (2017) took into the account the effects of financial distress in influencing the relationship between financial performance and stock returns.

D. Stock Returns Model from Tikasari and Surjandari (2020)

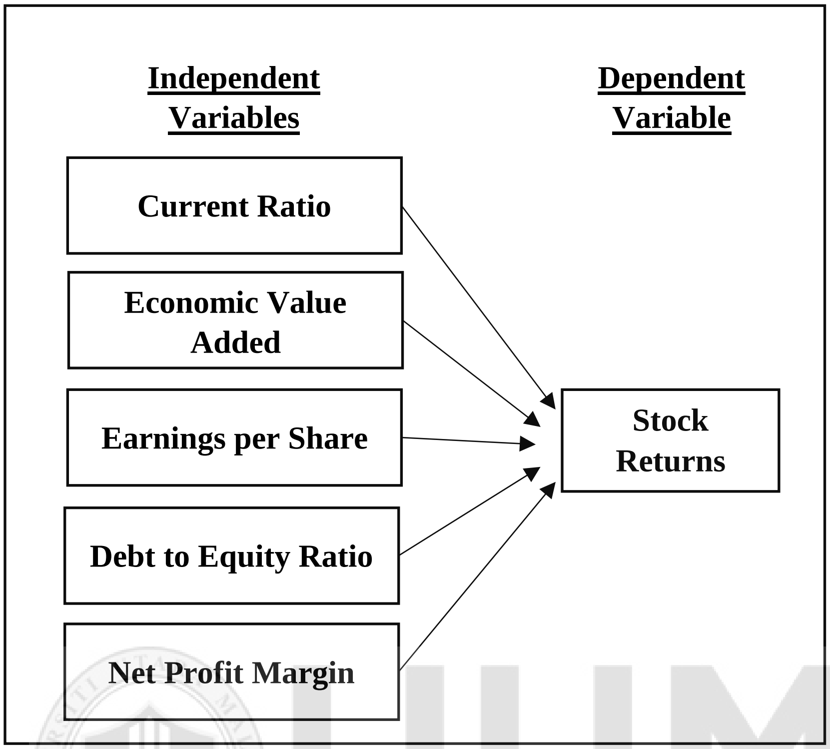

Figure 3.4
Stock Returns Model from Tikasari and Surjandari (2020)
Source: Tikasari and Surjandari (2020)

Figure 3.4 above shows the research framework employed by Tikasari and Surjandari (2020) to examine the relationship between financial performance and stock returns amongst the mining companies in Indonesia. Tikasari and Surjandari (2020) formulated the framework according to the Agency Theory and Signaling Theory.

Based on the previously developed frameworks, this study developed another framework (Figure 3.5) based on the Signaling Theory to study the relationship between revenue growth, earnings growth, changes in profitability and stock returns amongst the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

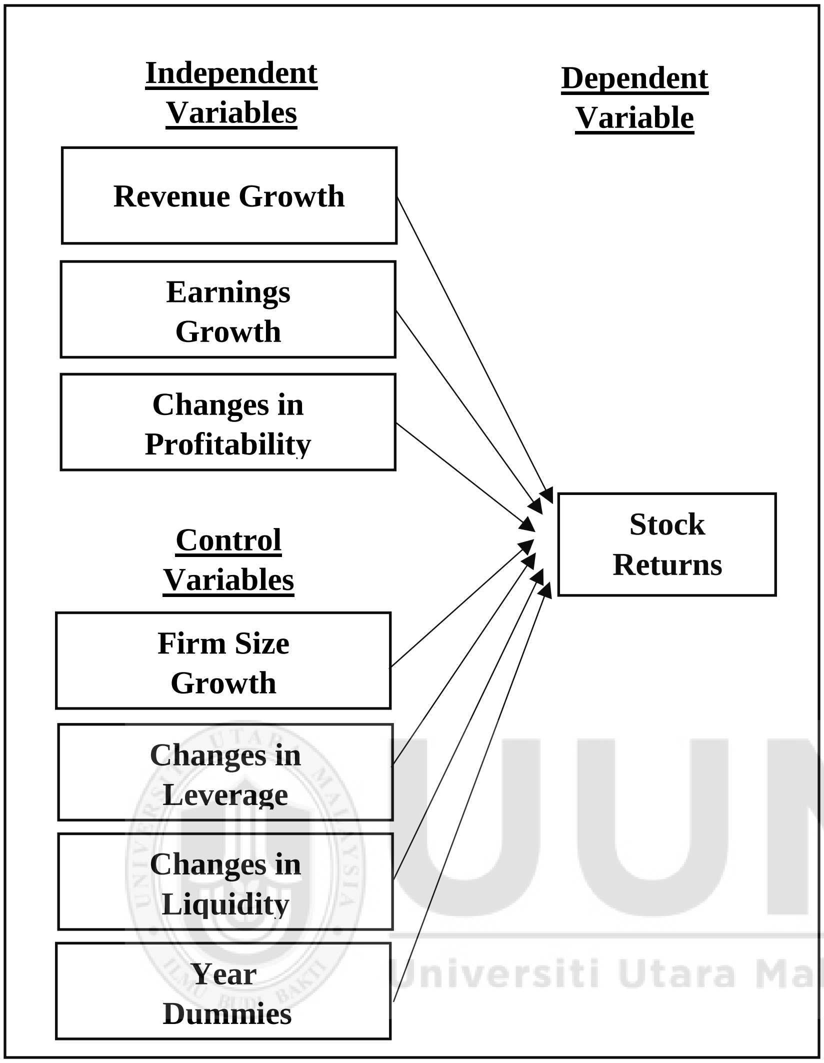

Figure 3.5
Conceptual Framework
Source: Author's compilation

The choice of the independent and dependent variables are made with the intention to achieve the research objectives. Additional control variables are incorporated into the conceptual framework to control for firm-specific attributes such as of firm size (total assets), leverage (total liabilities-to-total assets ratio), and liquidity (current ratio) (Chen, Kim, Yao, and Yu, 2010; Lee, Glasscock, and Park, 2017; Utami, 2017; Hung, Ha, and Binh, 2018). The year dummies are included to mitigate omitted variable bias (Wooldridge, 2013).

3.2 Hypotheses

The following hypotheses are formulated to test the relationship between revenue growth, earnings growth, changes in profitability and stock returns:

H_1: There is a significant relationship between revenue growth and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

H_2: There is a significant relationship between earnings growth and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

H_3: There is a significant relationship between the changes in profitability and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

3.3 Research Design

In this section, the type of study, sources of data, population frame, and sample involved in this research are elaborated.

3.3.1 Type of Study

This present study adopts the quantitative research method to study the relationship between revenue growth, earnings growth, changes in profitability and stock returns. Specifically, this study addresses the research problems through the testing of hypotheses that were developed based on the Signaling Theory. Thus, the usage of quantitative data is vital to facilitate the statistical testing of the hypotheses formed for this study.

3.3.2 Sources of Data

The secondary data collected for this study comes from two different sources. Firstly, the historical data on stock prices are collected from Yahoo Finance. On the other hand, the financial data such as revenue, earnings, book value of total equity etc., are manually collected from the annual reports of the non-financial companies sampled in this study. The annual reports of the sampled companies are publicly available and can be obtained from the official website of Bursa Malaysia.

3.3.3 Population Frame

The population selected for this study are all non-financial companies listed in the Malaysian stock market, which amounted to 901 non-financial companies. Financial companies are excluded from the population as per the common practices of corporate finance research. Generally, financial companies are not the subject of interest in empirical literature of corporate finance (Ammar, Eling, and Milidonis, 2015; Fama and French 2008; Rossi, Barth, and Cebula, 2018). This is because the highly indebted capital structures of financial companies make them appear financially distressed when compared to non-financial companies (Fama and French, 1992). Therefore, financial companies are incomparable to non-financial companies in terms of stock returns and risks (Foerster and Sapp, 2005). Moreover, Fama and French (2000) stated that financial companies exhibit abnormal profitability because the accounting methods practiced by financial companies are substantially different from those of non-financial companies. This further complicates the incomparability between financial and non-financial companies

(Opler and Titman, 1994). Based on these considerations, financial companies are excluded from the population of this study.

3.3.4 Sample and Sampling Technique

This study employs the purposive sampling technique. The initial sample selected for this study were 24 non-financial companies listed on the FTSE Bursa Malaysia KLCI from 2013 to 2019. As briefly discussed in Chapter 1, all 24 non-financial companies listed on the FTSE Bursa Malaysia KLCI were initially sampled in this study due to the representativeness of the FTSE Bursa Malaysia KLCI to the Malaysian stock market (Yacob, Mahdzan, and Arof, 2016). Table 3.1 in the next page tabulates the initial sample of 24 non-financial companies listed on the FTSE Bursa Malaysia KLCI as at 21 December 2020 (Bursa Malaysia Berhad, 2020).

The 7-year sampling period of 2013 to 2019 is selected for this study based on two main reasons. Firstly, this study will only consider financial data published after the formal adoption of the Malaysian Financial Reporting Standard (MFRS) framework beginning 1 January 2012 (Malaysian Accounting Standards Board, 2011). This is to ensure that the financial data employed in this study are consistent and compatible across the sampling period. However, the sampling period in this study starts from 2013 due to the use of changes in financial performance as variables, which resulted in the loss of observations for the year of 2012.

Table 3.1
Initial Sample of Non-Financial Companies Listed on FTSE Bursa Malaysia KLCI

No.	Stock Code	Name
1	6888	Axiata Group Berhad
2	7277	Dialog Group Berhad
3	6947	Digi.Com Berhad
4	3182	Genting Berhad
5	4715	Genting Malaysia Berhad
6	3034	Hap Seng Consolidated Berhad
7	5168	Hartalega Holdings Berhad
8	5225	IHH Healthcare Berhad
9	1961	IOI Corporation Berhad
10	2445	Kuala Lumpur Kepong Berhad
11	6012	Maxis Berhad
12	3816	MISC Berhad
13	4707	Nestle (M) Berhad
14	5183	Petronas Chemicals Group Berhad
15	5681	Petronas Dagangan Berhad
16	6033	Petronas Gas Berhad
17	4065	PPB Group Berhad
18	8869	Press Metal Aluminium Holdings Berhad
19	4197	Sime Darby Berhad
20	5285	Sime Darby Plantation Berhad
21	7106	Supermax Corporation Berhad
22	4863	Telekom Malaysia Berhad
23	5347	Tenaga Nasional Berhad
24	7113	Top Glove Corporation Berhad

Note: The final sample consists of 22 individual firms after the exclusion of Sime Darby Berhad and Sime Darby Plantation Berhad for reasons provided in subchapter 3.3.4.
Source: Bursa Malaysia Berhad (2020)

Secondly, the annual financial data for 2020 are unavailable as of the writing of this project paper since public-listed companies in Malaysia typically release their annual reports four months after the end of the financial year (Mirza, Malek, and

Abdul-Hamid, 2019). Thus, the sampling period of this study ends in 2019. Consequently, the 7-year sampling period from 2013 to 2019 is chosen based on these considerations.

However, two of the sampled companies, namely Sime Darby Berhad and Sime Darby Plantation Berhad, do not have the complete financial and stock price data across the 7-year sampling period from 2013 to 2019. Sime Darby Berhad is excluded from the sample because the company underwent a demerger exercise in 2017, which rendered the pre-merger and post-merger financial data of the company incomparable across the sampling period (Rao, 2017). With respect to Sime Darby Plantation Berhad, the stock price and financial data of the company are only available beginning from 2017, which is after the completion of the demerger exercise that separated Sime Darby Plantation Berhad from Sime Darby Berhad (Sidhu, 2017). Following the exclusion of Sime Darby Berhad and Sime Darby Plantation Berhad, the final sample selected in this study comprises of 22 non-financial companies listed on the FTSE Bursa Malaysia KLCI from 2013 to 2019. This final sample yielded a total of 154 firm-year observations, which is obtained by collecting 7 annual observations from each of the 22 sampled non-financial companies.

3.4 Operational Definition

The operational definition of the dependent, independent, and control variables involved in this study are elaborated as follows:

3.4.1 Stock Returns

Stock returns refer to the annual percentage change in stock prices (Tikasari and Surjandari, 2020). Stock prices refer to the closing market value per share of a company on the 4th month after the of the company's financial year-end. The 4-month gap is required because public-listed companies in Malaysia typically release their annual reports 4 months after the end of their respective financial year (Mirza, Malek, and Abdul-Hamid, 2019). The stock prices used in this study have been adjusted for dividends and splits.

3.4.2 Revenue Growth

Revenue growth is the year-on-year percentage change in revenue (Puspitaningtyas, 2017). In this study, revenue refers to the annual revenue per share of a company.

3.4.3 Earnings Growth

Earnings growth is the percentage change in earnings over a 1-year period (Ayundhasurya and Murtaqi, 2012). Earnings is defined as the annual net profit per share from continuing operations.

3.4.4 Changes in Profitability

Changes in profitability are measured as the annual differences between the current year and previous year return on equity (Robu, Jaba, Mironiuc, and Robu, 2014; Purnamasari, 2015). In this study, return on equity is defined as annual net profit from continuing operations divided by average book value of total equity (Musallam, 2018).

3.4.5 Firm Size Growth

Firm size growth refers to the annual percentage change in average total assets (Cooper, Gulen, Schill, 2008; Chen, Kim, Yao, and Yu, 2010).

3.4.6 Changes in Leverage

Changes in leverage refer to the yearly changes in the ratio of average total liabilities-to-average total assets (Lee, Glasscock, and Park, 2017; Utami, 2017; Hung, Ha, and Binh, 2018).

3.4.7 Changes in Liquidity

Changes in liquidity are measured as the annual changes in current ratio (Utami, 2017). Current ratio refers to the ratio of average current assets-to-average current liabilities (Sitorus and Elinarty, 2016).

3.4.8 Year Dummies

Year dummies refer to a set of dummy variables that equals to 1 for year t, or 0 otherwise (Chia, Lim, and Goh, 2020).

3.5 Data Collecting Procedures

Secondary data on the stock prices and financial information of Malaysian public-listed companies are freely available on the Internet. Therefore, all data relevant to this study are collected manually from online sources. Specifically, the stock price data are collected from Yahoo Finance whereas financial information such as revenue, earnings, book value of total equity, etc., are collected from the annual reports of the sampled non-financial companies.

3.6 Data Analysis Technique

This study employs the panel data regression to examine the relationship between revenue growth, earnings growth, changes in profitability and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI from 2013 to 2019. The panel data regressions are implemented using Stata (Version 14.2).

3.6.1 Basic Econometric Models

The choice between stock price and stock returns model is determined based on the specification of the variables involved in a study (Barth, Beaver, and Landsman, 2001; Kothari, 2001). The stock returns model is chosen for this study because it analyzes the influence of changes in financial performance towards stock returns (Hung, 2000; Ota, 2003).

The specification of the stock returns models involved in this study are as follows:

$$\%\Delta PRICE_{it} = a_0 + a_1\, RG_{it} + a_2\, \%\Delta ASSETS_{it} + \; a_3\, \Delta LEV_{it} + a_4\, \Delta CR_{it} + \textstyle\sum_{t=1}^{T-1} a_{5t} YD_t + e_{it} \quad (1)$$

$$\%\Delta PRICE_{it} = b_0 + b_1\, EG_{it} + b_2\, \%\Delta ASSETS_{it} + \; b_3\, \Delta LEV_{it} + b_4\, \Delta CR_{it} + \textstyle\sum_{t=1}^{T-1} b_{5t} YD_t + e_{it} \quad (2)$$

$$\%\Delta PRICE_{it} = c_0 + c_1\, \Delta PRF_{it} + c_2\, \%\Delta ASSETS_{it} + \; c_3\, \Delta LEV_{it} + c_4\, \Delta CR_{it} + \textstyle\sum_{t=1}^{T-1} c_{5t} YD_t + e_{it} \quad (3)$$

$$\%\Delta PRICE_{it} = d_0 + d_1\, RG_{it} + d_2\, EG_{it} + d_3\, \Delta PRF_{it} + d_4\, \%\Delta ASSETS_{it} + d_5\, \Delta LEV_{it} + d_6\, \Delta CR_{it} + \textstyle\sum_{t=1}^{T-1} d_{7t} YD_t + e_{it} \quad (4)$$

where $\%\Delta PRICE_{it}$ is the stock returns, RG_{it} is the revenue growth, EG_{it} is the earnings growth, ΔPRF_{it} is the changes in profitability, $\%\Delta ASSETS_{it}$ is the firm size growth, ΔLEV_{it} is the changes in leverage, and ΔCR_{it} is the changes in current ratio. YD_t represents the year dummies where YD_t equals to 1 for year t, and 0 otherwise. The slope coefficients are represented by *a*, *b*, *c*, and *d*. Lastly, e_{it} is the error term.

3.6.2 Panel Data Models

The data collected for this study is a set of balanced panel data, which consists of 154 observations recorded from 22 firms across a 7-year sampling period. However, the heterogeneity among firm characteristics may exert unobserved firm-effects that influence stock returns (Wooldridge, 2013).

In order to capture these unobserved firm-effects, the panel data estimation framework utilized by Narayan and Reddy (2018) is adapted in this study. The stock returns model provided in subchapter 3.6.1 can be expressed into three different forms of panel data model as follows:

A. Pooled Ordinary Least Square (OLS)

If the unobserved firm-effects, u_i, is assumed to be inexistent, then the pooled OLS estimator produces consistent and unbiased results (Wooldridge, 2013).

$$DV_{it} = \alpha + \sum \beta IV_{it} + \sum \gamma CV_{it} + e_{it} \tag{a}$$

where DV_{it} represents the dependent variable, IV_{it} denotes the independent variables, CV_{it} is the constant variables, α is the intercept constant, β and γ are the coefficients, and e_{it} is the error term.

B. Fixed Effects Model

If the unobserved firm-effects exist and correlate with the independent variables, then the fixed effects model is best used to capture or eliminate the unobserved effects (Wooldridge, 2013):

$$DV_{it} = (\alpha + u_i) + \sum \beta IV_{it} + \sum \gamma CV_{it} \tag{b}$$

where the coefficient variables are identical to those in equation (a) and u_i denotes the unobserved firm-effects correlated with the independent variables.

In this study, the least square dummy variable (LSDV) method is used to capture the unobserved firm-effects. The LSDV method uses firm dummy variables as proxies for the unobserved effects:

$$DV_{it} = (\alpha + \sum u_i FD_i) + \sum \beta IV_{it} + \sum \gamma CV_{it} \tag{b.1}$$

where FD_i represents the firm dummy variable.

C. Random Effects Model

If the unobserved firm-effects exist but are not correlated with the independent variables, then the random effects model should be implemented to account for the unobserved firm-effects (Wooldridge, 2013).

$$DV_{it} = a + \sum \beta IV_{it} + \sum \gamma CV_{it} + (u_i + e_{it}) \tag{c}$$

where the variables are identical to those in Equation (a) and u_i denotes the unobserved firm-effects uncorrelated with the independent variables.

In this study, the random effects model is implemented based on the feasible generalized least squares (FGLS) method, which requires the quasi-demean transformation of all variables:

$$\left(DV_{it} - \hat{\theta}\overline{DV}_i\right) = a\left(1 - \hat{\theta}\right) + \sum \beta\left(IV_{it} - \hat{\theta}\overline{IV}_i\right) + \sum \gamma\left(CV_{it} - \hat{\theta}\overline{CV}_i\right)$$
$$+u_i\left(1 - \hat{\theta}\right) + (e_{it} + \hat{\theta}\bar{e}_i) \tag{c.1}$$

Where $\hat{\theta}$ is the random effects estimator. $\overline{DV}_i$, $\overline{IV}_i$, $\overline{CV}_i$, and $\bar{e}_i$ are the time-averaged dependent variable, independent variable, control variable, and error term, respectively.

3.6.3 Panel Data Model Selection Tests

In order to determine the most suitable panel regression model for this study, the models are subjected to a series of model selection tests:

i. F Test

The F test checks for the presence of fixed effects in a panel data regression (Wooldridge, 2013). For the F-test, the null hypothesis postulates that the unobserved firm-effects (i.e., fixed effects) are inexistent. The failure to reject the null hypothesis of this test would suggest that there are no fixed effects in the regression, and the pooled OLS should be preferred over the fixed effects model.

ii. Breusch-Pagan Lagrange multiplier Test

The random effects in a panel regression is determined via the Breusch-Pagan Lagrange multiplier (BPLM) test (Breusch and Pagan, 1980). For the BPLM test, the null hypothesis suggest that the panel data do not exhibit firm-specific variances (i.e., random effects). The failure to reject the null hypothesis indicates the absence of random effects in the regression model, and the pooled OLS should be preferred over the random effect model.

iii. Hausman Test

If both the null hypotheses of the F-test and Breusch-Pagan LM test are rejected, then the Hausman test (Hausman, 1978) will be implemented to determine whether the fixed effects or random effects model is more efficient. The failure to reject the null hypothesis of this test would suggest that the random effects model is more efficient and should be preferred over the fixed effects model.

3.7 Summary

Overall, the methodology involved in this project paper, including the conceptual framework, hypotheses, research design, operational definition of the variables, population frame, sample and sampling techniques, data collecting procedures, and data analysis techniques have been elaborated in this chapter.

CHAPTER 4: FINDINGS AND DISCUSSIONS

4.0 Introduction

The purpose of this chapter is to report and discuss on the empirical findings of this study. The statistical analyses conducted in this study are implemented using the Stata statistical package (version 14.2). The statistical analyses involved are the summary statistics, pairwise correlation analyses, model selection tests, diagnostic checks and panel data analyses (pooled OLS). Diagnostic checks such as multicollinearity check (e.g., variance inflation factor), residual diagnostic tests (e.g., heteroscedasticity and serial correlation tests) and specification error test (e.g., Ramsey RESET) are conducted to verify the reliability of the panel data analyses. Finally, the empirical findings are discussed at the end of this chapter.

4.1 Summary Statistics

Table 4.1 on the following page illustrates the summary statistics of the data employed in this study. The key variables of interest in the summary statistics are stock returns ($\%\Delta PRICE_{it}$), revenue growth (RG_{it}), earnings growth (EG_{it}), and the changes in profitability (ΔPRF_{it}). Based on Table 4.1, the mean stock returns is 13.6415 percent with a standard deviation of 41.4056 percent, showing that the stock returns are quite volatile. The median stock returns is 4.4528 percent, which is roughly 3 times smaller as compared to the mean stock returns. The large disparity between the mean and median stock returns indicates that the distribution of stock returns may have been skewed by the presence of extreme values.

The mean and standard deviation of revenue growth are 5.5781 percent and 12.3587 percent, respectively. Revenue growth has a mean and standard deviation that are roughly one-third of the mean and standard deviation of stock returns. The median revenue growth is 4.1470 percent, which is close to the median stock returns.

The mean earnings growth is 7.2601 percent, slightly more than half of the mean stock returns. Notably, earnings growth exhibits the largest standard deviation of 246.9345 percent, indicating that earnings growth is the most volatile amongst all of the variables selected in this study. The median earnings growth is 3.5107 percent, which is almost 1 percentage point lower than the median stock returns. The large difference between the mean and median earnings growth suggests that the earnings growth data is skewed.

Finally, the mean and standard deviation of changes in profitability are 1.5928 percent and 27.9951 percent, respectively. On the other hand, the median changes in profitability is negative 0.26 percent. Changes in profitability have the smallest mean and median compared to those of stock returns, revenue growth, and earnings growth.

Table 4.1
Output of Summary Statistics

	Mean	**Median**	**Maximum**	**Mininum**	**Std Dev.**	**N x T**
$\%\Delta PRICE_{it}$	13.6415	4.4528	314.4923	- 0.4475	41.4056	154
RG_{it}	5.5781	4.1470	53.8772	-0.3825	12.3587	154
EG_{it}	7.2601	3.5107	2197.9440	- 16.4369	246.9345	154
ΔPRF_{it}	1.5928	- 0.2600	316.3832	- 0.6837	27.9951	154
$\%\Delta ASSETS_{it}$	8.5882	6.6442	76.6645	- 0.2257	11.4844	154
ΔLEV_{it}	0.4808	0.7705	55.6524	- 0.4619	8.7445	154
ΔCR_{it}	0.0173	- 3.7781	245.9006	- 1.6474	54.6673	154

Note: This table presents the summary statistics of all non-dummy variables in Model 1-4.
The definitions of the variables are discussed in subchapter 3.4.

4.2 Pairwise Correlation Analyses

Table 4.2 on the following page shows the pairwise correlation among the variables employed in this study. Based on Table 4.2, stock returns have weak and significant positive correlation with revenue growth, earnings growth, and firm size growth. Interestingly, changes in profitability have a very weak and insignificant positive correlation with stock returns. These findings suggest that higher stock return is significantly correlated to higher revenue growth and earnings growth, but not correlated to increments in profitability. Overall, none of the correlation coefficient between the variables exceeds the value of 0.8, which suggests that the panel data models used in this study are not at risk of serious multicollinearity issues (Kim, 2019).

4.3 Model Selection Tests

Table 4.3 on page 45 indicates the findings of the model selection tests, which aid in determining the most suitable panel data model for this study. When conducting the model selection tests on Model 1 to Model 4, the original standard errors of the models are not corrected using robust standard errors procedures. Recall that the F-test is used to select between the pooled OLS and fixed effects model, and the null hypothesis of the test posits that a model has no fixed effects. Based on Table 4.3, the null hypothesis of the F-tests for Model 1 to Model 4 are not rejected. These findings suggest the lack of fixed effects among Model 1 to Model 4. Thus, the pooled OLS should be the preferred estimation technique over the fixed effects model for Model 1 to Model 4.

Table 4.2
Output of Pairwise Correlation Matrix

	%ΔPRICE$_{it}$	**RG$_{it}$**	**EG$_{it}$**	**ΔPRF$_{it}$**	**%ΔASSETS$_{it}$**	**ΔLEV$_{it}$**	**ΔCR$_{it}$**
%ΔPRICE$_{it}$	1						
RG$_{it}$	0.2819***	1					
EG$_{it}$	0.1796**	0.1733**	1				
ΔPRF$_{it}$	0.0909	0.0556	0.0579	1			
%ΔASSETS$_{it}$	0.1854**	0.2759***	0.0330	-0.1039	1		
ΔLEV$_{it}$	0.0951	0.0915	- 0.0819	0.2600***	-0.0108	1	
ΔCR$_{it}$	- 0.0473	- 0.0902	- 0.0030	- 0.0942	0.0185	- 0.4641***	1

Notes: *** represents p-value less than 0.01. ** represents p-value than 0.05. This table indicates the pairwise correlation between the variables in Model 1-4. The definitions of the variables are discussed in subchapter 3.4.
Source: Author's calculation

The purpose of the Breusch-Pagan Lagrange Multiplier (BPLM) test is to choose between the pooled OLS and random effects model, and the null hypothesis of the test postulates that a model has no random effects. Based on Table 4.3, the null hypotheses of the BPLM tests for Model 1 to Model 4 are not rejected. These findings suggest the lack random effects in Model 1 to Model 4, and that pooled OLS should be the chosen as the appropriate estimation technique instead of the random effects model.

Given that both the F-test and BPLM test have suggested the use of pooled OLS estimation for Model 1 to Model 4, it is not necessary to conduct the Hausman test in order to choose between the fixed effects model and random effects model. Based on the results of the model selection tests, the pooled OLS is chosen as the most suitable technique to estimate the relationship between the variables in Model 1 to Model 4.

Table 4.3
Output of Model Selection Tests

	F-Test	**Breusch-Pagan LM Test**	**Hausman Test**
	F-statistics	Chi-bar Squared Statistics	Chi-squared Statistics
Model 1	1.18 (122)	0.00 (1)	N/A
Model 2	1.33 (122)	0.00 (1)	N/A
Model 3	1.46 (122)	0.86 (1)	N/A
Model 4	1.08 (120)	0.00 (1)	N/A

Notes: *** represents p-value less than 0.01. ** represents p-value than 0.05. Values inside parentheses () represent the degrees of freedom. For the model selection tests, the standard errors of the models are not corrected using robust standard error procedures. For Model 1-4, it is unnecessary to conduct the Hausman tests given that the null hypotheses of both the F-tests and Breusch-Pagan LM test have failed to be rejected.
Source: Author's Calculation

4.4 Diagnostic Checks

In order to ensure that the estimations produced by the pooled OLS regressions are reliable, the regression models are subjected to a series of diagnostic checks for multicollinearity, heteroscedasticity, serial correlation, and specification errors.

4.4.1 Variance Inflation Factors

Multicollinearity occurs when two or more independent variables in a model are strongly correlated with one another. The presence of serious multicollinearity problems would result in artificially insignificant independent variables as well as inflated standard errors for the variables' coefficient (Daoud, 2017; Kim, 2019).

In this study, the variance inflation factor (VIF) is used to gauge the degree of multicollinearity among the independent variables in the models. The VIF measures the extent in which the standard error of an independent variable's coefficient has been inflated due to the presence of other correlating independent variables (Daoud, 2017).

Table 4.4.1 tabulates the VIF values for the independent variables in Model 1 to Model 4. Based on Table 4.4.1, no VIF value is larger than five. This indicates that none of the models suffers from serious multicollinearity issues (Daud 2017; Kim, 2019). These findings further confirm the lack of multicollinearity problems between the independent variables as suggested by the pairwise correlation matrix (Table 4.2).

Table 4.4.1
Output of Variance Inflation Factors

	Model 1	**Model 2**	**Model 3**	**Model 4**
RG_{it}	1.17			1.21
EG_{it}		1.07		1.11
ΔPRF_{it}			1.21	1.22
$\%\Delta ASSETS_{it}$	1.19	1.08	1.09	1.21
ΔLEV_{it}	1.32	1.32	1.42	1.44
ΔCR_{it}	1.36	1.35	1.35	1.36
Mean	1.56	1.54	1.62	1.57

Notes: The variance inflation factors of the year dummies are not reported for brevity, but can be found in Appendix E. For the variance inflation factors, the original standard errors of the models are not corrected using robust standard error procedure.
Source: Author's calculation

4.4.2 Heteroscedasticity Tests

The pooled OLS regression assumes that the error terms of the regression have uniform variances and independent distribution. Heteroscedasticity occurs if such an assumption is violated in the pooled OLS regression. Heteroscedasticity results in biased F-statistics for the overall regression as well as inaccurate t-statistics and standard errors for the coefficient of the independent variables (Godfrey, 2006; Hayes and Cai, 2007).

The Breusch-Pagan (1979) and Cook-Weisberg (1983) tests are carried out to test for the presence of heteroscedasticity in Model 1 to Model 4. The null hypotheses of the heteroscedasticity tests posit that the error terms have uniform variance. Table 4.4.2 depicts the chi-squared statistics of the heteroscedasticity tests. In order to facilitate the heteroscedasticity tests, the original standard errors of the models are not adjusted using robust standard error procedures.

Based on Table 4.4.2, the null hypotheses of the heteroscedasticity tests are rejected at 1 percent significance level for the case of Model 1 and Model 4. On the other hand, the null hypothesis of the heteroscedasticity test for Model 2 is rejected at 5 percent significance level. Thus, it can be concluded that the variance of the error terms in Model 1, Model 2, and Model 4 are not uniform. This indicates the presence of heteroscedasticity in those models. These findings justify the usage of double-clustered robust standard errors in the models to account for heteroscedasticity (Peterson, 2009).

Table 4.4.2
Output of Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity

	Model 1	**Model 2**	**Model 3**	**Model 4**
Breusch-Pagan/ Cook-Weisberg Test for Heteroscedasticity	10.47*** (1)	6.46** (1)	2.04 (1)	14.32*** (1)

Notes: *** represents p-value less than 0.01. ** represents p-value than 0.05. The values inside parentheses () represent the degrees of freedom. For the heteroscedasticity tests, the original standard errors of the models are not corrected using robust standard error procedure.
Source: Author's Calculation

4.4.3 Serial Correlation Tests

Serial correlation is a statistical issue whereby the error terms of a regression are correlated with one another across successive periods of observation. The cause of serial correlation lies mainly in model misspecification (Olanrewaju, Yahaya, and Nasiru, 2017). The presence of serial correlation violates the assumption of the pooled OLS regression because the variance of the error terms are no longer uniform and independently distributed. The negative implications of having serial correlation in a regression model include underestimating the standard error of the independent variables' coefficient, overestimating of the t-statistics of the independent variables' coefficient, as well as overinflating the F-statistics and R-squared of the overall regression (Fomby, Johnson, and Hill, 1984).

In this study, the Wooldridge test is utilized to examine the models for first-order serial correlation (Wooldridge, 2010). First-order serial correlation is a specific type of serial correlation whereby the error term in one period of observation is correlated to the error term in the previous period of observation (Durbin, 1970). The null hypothesis of the Wooldridge test postulates that the error terms exhibit no first-order serial correlation.

Table 4.4.3 below shows the F-statistics of the serial correlation tests. In order to facilitate the serial correlation tests, the original standard errors of the models are not adjusted using robust standard error procedures. Based on Table 4.4.3, the null hypotheses of the serial correlation tests are not rejected for all models. Thus, it can be concluded that Model 1 to Model 4 do not suffer from first-order serial correlation issues.

Table 4.4.3
Output of Wooldridge Test for Serial Correlation

	Model 1	**Model 2**	**Model 3**	**Model 4**
Wooldridge Test for Serial Correlation	3.374 (21)	1.796 (21)	3.193 (21)	2.270 (21)

Notes: *** represents p-value less than 0.01. ** represents p-value than 0.05. The values inside parentheses () represent the degrees of freedom. For the serial correlation tests, the original standard errors of the models are not corrected using robust standard error procedure.
Source: Author's Calculation

4.4.4 Specification Error Tests

Specification errors occur due to various misspecification in a model, including the failure to incorporate key independent variables (Ramsey, 1969). The presence of specification error would result in inconsistent and incorrect coefficient for the independent variables (Deegan Jr., 1976).

In this study, the Ramsey Regression Equation Specification Error Test (RESET) is employed to test for specification errors in the models (Ramsey, 1969). The null hypothesis of the Ramsey RESET assumes that a model has no omitted variables.

Table 4.4.4 reports the F-statistics of the Ramsey RESET tests. Based on Table 4.4.4, the null hypotheses of the Ramsey RESET for Model 1 to Model 4 have failed to be rejected. The statistical evidence from these tests suggest that the models do not suffer from omitted variable bias, and thus, are free from specification errors.

Table 4.4.4
Output of Ramsey Regression Equation Specification Error Test

	Model 1	**Model 2**	**Model 3**	**Model 4**
Ramsey RESET Test for Omitted Variables	1.01 (140)	0.48 (140)	0.47 (140)	0.73 (138)

Notes: *** represents p-value less than 0.01. ** represents p-value than 0.05. The values inside parentheses () represent the degrees of freedom. For the specification error tests, the original standard errors of the models are not corrected using robust standard error procedure.
Source: Author’s Calculation

4.5 Panel Data Analyses and Discussions

Table 4.5 on the next page summarizes the pooled OLS estimations for Model 1 to Model 4. In order to take into account of heteroscedasticity, the pooled OLS estimations are carried out using the double-clustered robust standard errors (Peterson, 2009). The coefficients of the year dummies are not reported in Table 4.5 but can be found in Appendix I. Generally, the overall F-statistics suggest that all of the models are significant in explaining stock returns. The F-statistics of Model 1, Model 2, and Model 4 are significant at 1 percent significance level whereas the F-statistics of Model 3 is significant at 5 percent significance level. Interestingly, Model 2 reports the highest overall F-statistics (4.68) as compared to the F-statistics of Model 1 (3.29), Model 3 (2.41), and Model 4 (4.54). This suggests that the earnings growth data are a better fit in the regression model as compared to the data of revenue growth and changes in profitability.

In terms of the adjusted R-squared, none of the models managed to explain more than 10 percent of the variation in stock returns. This suggests that more than 90 percent of the changes in stock returns are not explained by the financial performance variables in the models. Among Model 1 to Model 3, the highest adjusted R-squared belongs to Model 1, followed by Model 2 and Model 3. This suggests that revenue growth has more explanatory power on stock returns, followed by earnings growth and then changes in profitability. The adjusted R-squared showed a slight improvement when all of the independent variables (i.e. revenue growth, earnings growth, and changes in profitability) are included in Model 4. This suggests that all of the independent variables contribute incremental explanatory power in explaining stock returns.

Table 4.5
Output of Pooled OLS Estimation

	Model 1	Model 2	Model 3	Model 4
Constant	0.1981*** (0.0149) [13.28]	0.2181*** (0.0278) [7.84]	0.1997*** (0.0402) [4.97]	0.1958*** (0.0333) [5.88]
RG_{it}	0.8059 (0.5339) [1.51]			0.7172 (0.4869) [1.47]
EG_{it}		0.0304*** (0.0053) [5.72]		0.0245*** (0.0055) [4.49]
ΔPRF_{it}			0.0707 (0.1240) [0.57]	0.0247 (0.0977) [0.25]
$\%\Delta ASSETS_{it}$	0.4651 (0.2997) [1.55]	0.7168*** (0.2129) [3.37]	0.7541*** (0.2101) [3.59]	0.4853 (0.2972) [1.63]
ΔLEV_{it}	0.4769*** (0.1443) [3.30]	0.6275*** (0.1962) [3.20]	0.4928** (0.2496) [1.97]	0.5149** (0.2131) [2.42]
ΔCR_{it}	0.0137 (0.0409) [0.33]	0.0021 (0.0273) [0.08]	0.0012 (0.0301) [0.04]	0.0117 (0.0378) [0.31]
Year Dummies	Included	Included	Included	Included
F-statistics	3.29***	4.68***	2.41**	4.54***
Degrees of Freedom	143	143	143	141
Adj. R^2	0.0653	0.0453	0.0144	0.0738
SSM	3.3165	2.8254	2.0686	3.8410
SSE	22.9142	23.4052	24.1621	22.3897
Root MSE	0.4003	0.4046	0.4111	0.3985
Cross Section	22	22	22	22

Notes: *** represents p-value less than 0.01. ** represents p-value than 0.05. The dependent variable for Model 1-4 is stock returns ($\%\Delta PRICE_{it}$). The values inside parentheses () and [] denote the standard error and t-statistics, respectively. The definitions of the variables are discussed in subchapter 3.4. The coefficients of the year dummies are not reported in order to conserve space, but can be found in Appendix I. The standard errors are corrected using double-clustered robust standard errors (Peterson, 2009).
Source: Author's Calculation

Overall, the F-statistics suggested that Model 2 is the best in terms of model fitness. However, the adjusted R-squared suggested that Model 4 has the greatest explanatory power in explaining stock returns.

In terms of the control variables, all three control variables exhibit positive coefficients across Model 1 to Model 4. Firm size growth (i.e., total assets growth) has a significant relationship with stock returns (at 1 percent significance level) in Model 2 and 3. It is worth to note that firm size growth loses its significance when revenue growth is incorporated into the same model, as seen in Model 1 and Model 4. This suggests that in the presence of revenue growth, total assets growth will become an ineffective proxy for firm size growth. The changes in leverage variable is generally significant at 1 percent significance level across all models, with the exception of Model 3, in which the changes in leverage variable is only significant at 5 percent significance level. Finally, the changes in current ratio variable has no significant relationship with stock returns across Model 1 to Model 4.

The results of the hypothesis testing in Table 4.5 are reported and discussed as follows:

Hypothesis 1: There is a significant relationship between revenue growth and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

According to Model 1 and Model 4, it is suggested that revenue growth has a positive relationship with stock returns. However, the t-values of the coefficients in both Model 1 and Model 4 are insignificant. Thus, Hypothesis 1 of this study is not accepted, and it can be concluded that revenue growth has no relationship with stock returns.

The rejection of Hypothesis 1 indicates that revenue growth has no significant relationship with stock returns among the non-financial firms listed on the FTSE Bursa Malaysia KLCI. This result confirms the lack of association between revenue growth and stock returns in Malaysia as documented by Lau, Lee, and McInish (2002). Moreover, this finding also corroborates with the conclusions reached by Chen, Kim, Yao, and Yu (2010), Tahir, Sabir, Alam, and Ismail (2013), Pranata and Pujiati (2015), Puspitaningtyas (2017), and Brahma

(2018). However, the result of this study does not agree with the works of Jegadeesh and Livat (2006), Chandra and Ro (2008), and Srinivasan (2012), all of whom reported a significantly positive relationship between stock returns and revenue growth.

The apparent lack of influence exerted by revenue growth on stock returns suggests that revenue growth signals little information that contributes to the investment decision-making process of investors (Chen, Kim, Yao, and Yu, 2010). Puspitaningtyas (2017) argued that investors favour earnings-specific information over revenue-specific information because earnings-specific information directly signals the amount of potential income to be received by investors. Based on this premise, higher revenue growth will not translate into higher stock returns if the accompanying higher earnings growth did not occur in tandem with the revenue growth. Thus, revenue growth is not perceived by investors as an important signal about a firm's future prospects given that higher revenue growth does not necessarily contribute to higher earnings growth (Pranata and Pujiati, 2015).

The signaling role of expected and unexpected revenue growth may also influence the decision-making process of investors. Jegadeesh and Livnat (2006) as well as Chandra and Ro (2008) found that investors react to the unexpected portion of revenue growth when assessing stock returns, especially if the unexpected revenue growth signals robust earnings growth. Moreover, Jegadeesh and Livnat (2006) also reported that the influence of unexpected revenue growth on stock returns was not present among large firms. These considerations present two implications to this study. Firstly, it can be alleged that revenue growth does not affect stock returns in this study because the sampled companies do not exhibit significant components of unexpected revenue growth. Secondly, the companies sampled in this study are among the largest public-listed corporations in Malaysia. Thus, if the findings of Jegadeesh and Livnat (2006) are applicable in Malaysia, then it can be inferred that unexpected revenue growth does not affect the stock returns of the large firms sampled in this study. However, these assertions are still inconclusive since the relationship between unexpected revenue growth and stock returns remain empirically unexplored in this study. More work is needed to uncover the relationship between unexpected revenue growth and stock returns based on firm sizes in Malaysia.

Hypothesis 2: There is a significant relationship between earnings growth and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

In Model 2, the earnings growth coefficient suggests a positive relationship between earnings growth and stock returns. Based on Model 2, a percentage increase in earnings growth is associated with a 0.0304 percent increment in stock returns, while holding the other independent variables constant. The t-value of the coefficient suggests that the relationship between earnings growth and stock returns is highly significant at 1 percent significance level.

On the other hand, the result of Model 4 corroborates with the result of Model 2, in which earnings growth has a significantly positive relationship with stock returns. The earnings growth coefficient in Model 4 suggests that on average, if earnings growth rose by 1 percent, stock returns would increase by 0.0245 percent, while holding other independent variables constant. Interestingly, the earnings growth coefficient in Model 4 is smaller than that of Model 2. This implies that in the presence of other financial performance variables, earnings growth will have a less pronounced relationship with stock returns.

Overall, the findings from Model 2 and Model 4 support the acceptance of Hypothesis 2 of this study, and it can be concluded that there is a significant relationship between earnings growth and stock returns.

The result of this study indicates that earnings growth has a positive influence on the stock returns of the non-financial companies listed on the FTSE Bursa Malaysia KLCI. This finding supports the earlier conclusion reached by Mirza, Malek, and Abdul-Hamid (2019), whom also reported the positive relationship between earnings and stock price variation among Malaysian firms. Moreover, the finding of this study is in-line with the works of Gschwandtner and Hauser (2016), Atidhira and Yustina (2017), Lee, Glasscock and Park (2017), Prayogo and Lestari (2018), Puspitaningtyas (2017), and Muhammad and Ali (2018). On the other hand, this study does not support the works of Vakilifard and Shahmoradi (2014) as well as Tikasari and Surjandari (2020), all of whom found that earnings growth does not affect stock returns.

The significant influence of earnings growth on stock returns suggests that investors rely on earnings growth as one of the key signals in making investment decisions (Atidhira and Yustina, 2017; Muhammad and Ali, 2018; Prayogo and Lestari, 2018). Puspitaningtyas (2017) argued that investors rely on earnings-related signals for making investment decisions because it directly conveys the potential amount of income attributable to investors. Higher earnings growth would then encourage higher demand for a company's stock, which in turn leads to the increase in the stock prices of the company (Gschwandtner and Hauser, 2016).

Similar to revenue growth, investors also consider the expected and unexpected components of earnings growth (Chandra and Ro, 2008). However, the influence of expected and unexpected earnings growth on stock returns remain unexplored in this study.

Hypothesis 3: There is a significant relationship between the changes in profitability and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

Both Model 3 and Model 4 suggest a positive relationship between stock returns and the changes in profitability. However, the t-values of the coefficients for changes in profitability are insignificant, which indicate the lack of relationship between changes in profitability and stock returns. Therefore, Hypothesis 3 of this study is not accepted.

The rejection of Hypothesis 3 showed that the changes in profitability do not affect the stock returns of the non-financial companies listed on FTSE Bursa Malaysia KLCI. This result is similar to the findings reported by Ali et al. (2017), Atidhira and Yustina (2017), Bayrakdaroglu, Mirgen, and Kuyu (2017), Puspitaningtyas (2017), Brahma (2018), and Musallam (2018). At the same time, this finding does not support the existence of a significant relationship between changes in profitability and stock returns as reported by Pranata and Pujiati (2015), Wijesundera et al. (2015), Khan, Aleemi, and Qureshi (2016), Sitorus and Elinarty (2017), Hung, Ha, Binh (2018), Muhammad and Ali (2018), and Lim, Palatino-Sotes, Wang, and Yao (2021).

Notably, the result of this study contradicts the conclusion reached by Nakhaei (2018), whom concluded that profitability significantly affects the stock returns of Malaysian companies. Compared to this study, Nakhaei (2018) employed a larger sample size of 395 non-financial companies as well as a longer sampling period from 2006 to 2015 (10 years).

The differences in sample size and sampling period could be one of the reasons that this study has produced findings that are contradictory to Nakhaei (2018).

Even though the earnings growth and changes in profitability variables are constructed using the same numerator (net profit from continuing operations), it is surprising that both variables did not produce the same significance in this study. The difference in terms of significance may be attributed to the different denominators used in the construction of both variables. Earnings growth reflects the percentage change in net profit per share from continuing operations, whereas the changes in profitability indicate the change in the net profit from continuing operations per book value of total equity. Thus, it is possible for both variables to produce dissimilar significance because both variables do not reflect the same information on financial performance.

According to Pupitaningtyas (2017), stock returns are not significantly affected by profitability because investors rely on earnings-related information as opposed to profitability-related information when making investment decisions. In the context of this study, investors may rely on earnings growth rather than changes in profitability when making investment decisions because the former directly implies the growth in income attributable to investors.

Atidhira and Yustina (2017) argued that the relationship between profitability and stock returns may vary according to the different profitability measures used. Since the profitability variable used in this study is proxied by return on equity, it is only fair for this study to conclude that stock returns has no significant relationship with the changes in return on equity among the non-financial companies listed on the FTSE Bursa Malaysia KLCI.

Finally, firm sizes may also play a role in explaining the lack of relationship between changes in profitability and stock returns. According to Brahma (2018) and Lim, Palatino-Sotes, Wang, and Yao (2021), the association between changes in profitability and stock returns is not apparent among large firms. Brahma (2018) argued that investors expect higher profitability from smaller firms due to the riskier nature of those firms. When smaller firms signal better future prospects via the achievement of higher profitability, investors would react positively by bidding up the stock prices of those companies. On the other hand, higher profitability does not signal brighter future prospects for large firms because those firms are already well established and well regarded by the investment community. In this study, the sampled companies are among the largest in Malaysia in terms of market capitalization. Thus, it can be suspected that the large firms sampled in this study may have caused the relationship between changes in profitability and stock returns to become insignificant. However, more work is needed to examine the relationship between changes in profitability and stock returns based on firm sizes in Malaysia.

4.6 Summary

This chapter serves to document the empirical findings of this study. The statistical analyses involved in this study include the summary statistics, pairwise correlation analyses, model selection tests, diagnostic checks, and pooled OLS estimations. The diagnostic checks are conducted to test for the presence of multicollinearity, heteroscedasticity, serial correlation, and specification errors in the pooled OLS regression. The findings are discussed at the end of this chapter.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes and concludes the study on the relationship between the selected financial performance variables and stock returns among the non-financial companies listed on the FTSE Bursa Malaysia KLCI. The limitations and recommendations relevant to this study are discussed at the end of this chapter.

5.1 Summary of Findings

The main objective of this study is to analyze the influence of revenue growth, earnings growth, and changes in profitability towards the stock returns of non-financial companies listed on the FTSE Bursa Malaysia KLCI from 2013 to 2019.

Based on the model selection tests, both the F-test and BPLM test have indicated the pooled OLS model as the preferred technique to estimate the models involved in this study. An array of diagnostic checks were also conducted to ensure that the output of the pooled OLS regressions are reliable and unbiased. Based on the diagnostic test results, it was found that the pooled OLS regressions are free from multicollinearity, serial correlation, and specification errors. However, heteroscedasticity was found to be present in the regressions. The issue of heteroscedasticity in the regressions was mitigated by using the double-clustered robust standard errors (Peterson, 2009).

Based on the pooled data regressions conducted in this study, only one out of the three independent variable was found to be significantly related to stock returns. With respect to the first research objective, this study has found that revenue growth has no influence on the stock returns of the non-financial companies sampled in this study. Thus, the first hypothesis that posits the significant relationship between revenue growth and stock returns has been rejected in this study.

With reference to the second research objective, the result of this study indicated that earnings growth significantly influences the stock returns of the sampled companies. Therefore, the second hypothesis regarding the existence of a meaningful relationship between earnings growth and stock returns has been accepted in this study.

Finally, this study has also found that the changes in profitability do not affect the stock returns of the sampled companies. Hence, the third hypothesis pertaining to the significant relationship between changes in profitability and stock returns was not accepted in this study.

5.2 Limitations

The limitations of this study include the narrow sample size, lack of analysis on the expected and unexpected components of revenue and earnings growth, as well as the limited selection of independent variables that explain stock returns.

5.2.1 Narrow Sample Size

The sample involved in this study consisted of the non-financial companies listed on the FTSE Bursa Malaysia KLCI, of which the combined market value of the sample represents about half the market capitalization of the Malaysian stock market (Bursa Malaysia Berhad, 2021a; MalaysiaStock.biz, 2021). However, the sample merely included 22 of the 901 companies listed in the Malaysian stock market. Thus, the findings of this study cannot be generalized across all of the companies listed in the Malaysian stock market. Moreover, the sample did not consider companies that have been delisted from the FTSE Bursa Malaysia KLCI and/or the Malaysian stock market. Therefore, there is a possibility that the findings of this study were inaccurate due to survivorship bias (Davis, 1996). Furthermore, the sampling period involved in this study was too short for panel unit root testing. The inability to account for data stationarity meant that this study could not be extended to test for any possible long- and short-run relationship between stock returns and other explanatory variables.

5.2.2 Expected and Unexpected Components in Revenue and Earnings

In this study, the expected and unexpected components of the revenue growth and earnings growth variable were not considered in the conceptual framework. Although this study has reported that earnings growth was related to stock returns, it was unable to pinpoint whether stock returns was specifically affected by expected earnings growth or unexpected earnings growth.

5.2.3 Other Variables that Explain Stock Returns

This study has not considered other macroeconomic and financial variables that influence stock returns (Atidhira and Yustina, 2017; Bayrakdaroglu, Mirgen, and Kuyu, 2017; Rjoub, Civcir, and Resatoglu, 2017). Consequently, the adjusted R-squared of the pooled OLS regressions in this study were low (less than 10 percent), which implied that a significant portion of the stock returns variation were not explained by the regression models.

5.3 Recommendation

The findings of this study bring important implications to investors and corporate practitioners. Since stock returns are positively associated with earnings growth, it would be beneficial for investors to place more emphasis on the evaluation of corporate earnings growth in their investment decision-making process. This strategy of screening and identifying for companies that exhibit earnings growth may help ease the effort of investors in uncovering investment opportunities.

On the other hand, corporate finance practitioners and managers should formulate business strategies that generate the largest possible earnings growth in order to maximize value creation for investors. However, business strategies that placed too much emphasis on earnings growth may incentivize managers to manipulate earnings in order to boost short-term stock returns (Ghosh, Gu, and Jain, 2005). Chronic earnings manipulation by the management may result in investors distrusting earnings growth as a reliable signal for assessing a firm's future prospects. Ultimately, unbridled earnings manipulation may cause the relationship between stock returns and earnings growth to weaken or disappear (Vakilifard and Shahmoradi, 2014). To avoid such consequences, corporate finance practitioners and managers should strive to maximize stock returns via achieving sustainable earnings growth (Ghosh, Gu, and Jain, 2005).

Besides the recommendations to investors and corporate finance practitioners, this study also furnishes a few recommendations for future research. Firstly, the sample of future studies should include all of the companies listed in a stock market so that the findings can be generalized across the population. The enlarged sample may also allow researchers to conduct granular analysis on stock returns based on firm sizes, industry, firm age, and other firm characteristics. Moreover, all delisted entities should be included in the sample so that survivorship bias can be mitigated when drawing conclusions from the statistical analyses (Davis, 1996). Future studies may also attempt to elongate the sampling period in order to study the long- and short-term relationship between the explanatory variables and stock returns (Humpe and McMillan, 2020).

Secondly, future studies should also account for both the expected and unexpected components of the revenue and earnings growth variable (Jegadeesh and Livnat, 2006; Chandra and Ro, 2008). This will allow researchers to gain more insights on the specific revenue and earnings component that contribute to stock returns.

Finally, stock returns can also be explained by other variables not covered in this study. Stock returns may respond to changes in various macroeconomic variables such as productivity (Chun, Kim, and Morck, 2016; Humpe and McMillan, 2020), interest rate (Alam and Uddin, 2009; Eldomiaty, Saeed, Hammam, and Aboulsoud, 2020), exchange rate (Zarei, Ariff, and Bhatti, 2019), and inflation rate (Eldomiaty, Saeed, Hammam, and Aboulsoud, 2020). Stock returns are also associated with firm-level financial and non-financial variables such as corporate governance (Bashir and Asad, 2018), dividend policy (Tahu and Susilo, 2017), working capital management (Mazlan and Choong, 2018), innovation (Ismanu and Kusmintarti, 2019), investment (Wahyuni and Hafiz, 2019), commodity prices (Ildirar and Iscan, 2015), and among others. Future studies may consider these variables when researching on the factors that drive stock returns.

5.4 Conclusion

The purpose of this study is to determine the influence of revenue growth, earnings growth, and changes in profitability towards the stock returns of the non-financial companies listed on the FTSE Bursa Malaysia KLCI. The pooled OLS regressions conducted in this study indicated that only earnings growth exhibited a significantly positive relationship with stock returns. On the other hand, revenue growth and changes in profitability was not found to affect the stock returns of the sampled companies. The reported findings suggest that investors and corporate practitioners should place more emphasis on earnings growth in their respective business and/or investment strategies. Lastly, the relevant research limitations and recommendations discussed in this study include the narrow sample size, expected and unexpected components in revenue and earnings growth, as well as other variables that affect stock returns.

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APPENDICES

Appendix A: Summary Statistics

Appendix A.1: Output of Basic Summary Statistics

```
. summarize c_price rg eg c_prf c_assets c_lev c_cr
```

Variable	Obs	Mean	Std. Dev.	Min	Max
c_price	154	13.6415	41.40559	-44.75437	314.4923
rg	154	5.578055	12.35873	-38.2476	53.8772
eg	154	7.260121	246.9345	-1643.685	2197.944
c_prf	154	1.592804	27.99511	-68.36888	316.3832
c_assets	154	8.588164	11.48435	-22.56773	76.66454
c_lev	154	.4807778	8.744486	-46.19478	55.65244
c_cr	154	.0172774	54.66731	-164.7423	245.9006

Appendix A.2: Output of Detailed Summary Statistics

```
. summarize c_price rg eg c_prf c_assets c_lev c_cr, detail
```

C_PRICE

	Percentiles	Smallest		
1%	-37.6299	-44.75437		
5%	-22.80282	-37.6299		
10%	-15.83409	-35.81941	Obs	154
25%	-5.561099	-35.1133	Sum of Wgt.	154
50%	4.452806		Mean	13.6415
		Largest	Std. Dev.	41.40559
75%	17.61072	99.24044		
90%	51.52808	189.9886	Variance	1714.423
95%	75.10265	210.1318	Skewness	3.899534
99%	210.1318	314.4923	Kurtosis	24.46298

Appendix A.2: Output of Detailed Summary Statistics - Continued

RG

	Percentiles	Smallest		
1%	-23.27946	-38.2476		
5%	-14.06866	-23.27946		
10%	-7.660892	-22.51263	Obs	154
25%	-.0175574	-22.25549	Sum of Wgt.	154
50%	4.146947		Mean	5.578055
		Largest	Std. Dev.	12.35873
75%	11.3439	32.04203		
90%	21.59301	33.86888	Variance	152.7382
95%	29.43818	36.93041	Skewness	.250653
99%	36.93041	53.8772	Kurtosis	5.075708

EG

	Percentiles	Smallest		
1%	-527.9371	-1643.685		
5%	-94.78199	-527.9371		
10%	-39.48238	-313.9731	Obs	154
25%	-14.63043	-136.4866	Sum of Wgt.	154
50%	3.510702		Mean	7.260121
		Largest	Std. Dev.	246.9345
75%	14.61279	125.3178		
90%	41.59024	276.3271	Variance	60976.63
95%	76.89536	1079.38	Skewness	3.079273
99%	1079.38	2197.944	Kurtosis	56.40865

C_PRF

	Percentiles	Smallest		
1%	-43.57399	-68.36888		
5%	-15.73856	-43.57399		
10%	-8.329104	-29.85539	Obs	154
25%	-3.302154	-25.98898	Sum of Wgt.	154
50%	-.2600148		Mean	1.592804
		Largest	Std. Dev.	27.99511
75%	2.097807	26.51097		
90%	8.064297	28.60416	Variance	783.7264
95%	14.51819	68.68031	Skewness	9.269647
99%	68.68031	316.3832	Kurtosis	105.7292

Appendix A.2: Output of Detailed Summary Statistics - Continued

C_ASSETS

	Percentiles	Smallest		
1%	-15.40717	-22.56773		
5%	-6.164492	-15.40717		
10%	-2.034045	-11.14442	Obs	154
25%	2.965867	-10.11814	Sum of Wgt.	154
50%	6.644194		Mean	8.588164
		Largest	Std. Dev.	11.48435
75%	11.84716	38.41581		
90%	18.27505	39.04282	Variance	131.8902
95%	32.32935	40.62635	Skewness	1.837133
99%	40.62635	76.66454	Kurtosis	10.9701

C_LEV

	Percentiles	Smallest		
1%	-31.4883	-46.19478		
5%	-8.242263	-31.4883		
10%	-6.095196	-22.27312	Obs	154
25%	-1.329451	-19.89503	Sum of Wgt.	154
50%	.7704552		Mean	.4807778
		Largest	Std. Dev.	8.744486
75%	2.967606	23.85098		
90%	5.276608	23.91029	Variance	76.46604
95%	8.814173	28.33346	Skewness	.5201386
99%	28.33346	55.65244	Kurtosis	19.1248

C_CR

	Percentiles	Smallest		
1%	-159.5796	-164.7423		
5%	-59.73211	-159.5796		
10%	-49.40484	-145.9932	Obs	154
25%	-20.13411	-125.1171	Sum of Wgt.	154
50%	-3.778096		Mean	.0172774
		Largest	Std. Dev.	54.66731
75%	13.33082	165.4426		
90%	44.73867	167.8274	Variance	2988.515
95%	100.0756	244.9336	Skewness	1.232159
99%	244.9336	245.9006	Kurtosis	9.178089

Appendix B: Output of Pairwise Correlation Matrix

```
. pwcorr c_price rg eg c_prf c_assets c_lev c_cr, sig
```

	c_price	rg	eg	c_prf	c_assets	c_lev	c_cr
c_price	1.0000						
rg	0.2819	1.0000					
	0.0004						
eg	0.1796	0.1733	1.0000				
	0.0259	0.0316					
c_prf	0.0909	0.0556	0.0579	1.0000			
	0.2625	0.4935	0.4756				
c_assets	0.1854	0.2759	0.0330	-0.1039	1.0000		
	0.0213	0.0005	0.6845	0.1999			
c_lev	0.0951	0.0915	-0.0819	0.2600	-0.0108	1.0000	
	0.2407	0.2592	0.3125	0.0011	0.8943		
c_cr	-0.0473	-0.0902	-0.0030	-0.0942	0.0185	-0.4641	1.0000
	0.5605	0.2660	0.9710	0.2454	0.8199	0.0000	

Note: The values below the correlation coefficients are the p-values.
Source: Author's calculation

Appendix C: F-Test

Appendix C.1: Output of F-Test (Model 1)

```
. quietly reg c_price rg c_assets c_lev c_cr y2014-y2019 f2-f22

. test f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12 f13 f14 f15 f16 f17 f18 f19 f20 f21 f22

 ( 1)  f2 = 0
 ( 2)  f3 = 0
 ( 3)  f4 = 0
 ( 4)  f5 = 0
 ( 5)  f6 = 0
 ( 6)  f7 = 0
 ( 7)  f8 = 0
 ( 8)  f9 = 0
 ( 9)  f10 = 0
 (10)  f11 = 0
 (11)  f12 = 0
 (12)  f13 = 0
 (13)  f14 = 0
 (14)  f15 = 0
 (15)  f16 = 0
 (16)  f17 = 0
 (17)  f18 = 0
 (18)  f19 = 0
 (19)  f20 = 0
 (20)  f21 = 0
 (21)  f22 = 0

       F( 21,   122) =    1.18
            Prob > F =    0.2801
```

Note: For the F-tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix C.2: Output of F-Test (Model 2)

```
. quietly reg c_price eg c_assets c_lev c_cr y2014-y2019 f2-f22

. test f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12 f13 f14 f15 f16 f17 f18 f19 f20 f21 f22

 ( 1)  f2 = 0
 ( 2)  f3 = 0
 ( 3)  f4 = 0
 ( 4)  f5 = 0
 ( 5)  f6 = 0
 ( 6)  f7 = 0
 ( 7)  f8 = 0
 ( 8)  f9 = 0
 ( 9)  f10 = 0
 (10)  f11 = 0
 (11)  f12 = 0
 (12)  f13 = 0
 (13)  f14 = 0
 (14)  f15 = 0
 (15)  f16 = 0
 (16)  f17 = 0
 (17)  f18 = 0
 (18)  f19 = 0
 (19)  f20 = 0
 (20)  f21 = 0
 (21)  f22 = 0

       F( 21,   122) =    1.33
            Prob > F =    0.1676
```

Note: For the F-tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix C.3: Output of F-Test (Model 3)

```
. quietly reg c_price c_prf c_assets c_lev c_cr y2014-y2019 f2-f22

. test f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12 f13 f14 f15 f16 f17 f18 f19 f20 f21 f22

 ( 1)  f2 = 0
 ( 2)  f3 = 0
 ( 3)  f4 = 0
 ( 4)  f5 = 0
 ( 5)  f6 = 0
 ( 6)  f7 = 0
 ( 7)  f8 = 0
 ( 8)  f9 = 0
 ( 9)  f10 = 0
 (10)  f11 = 0
 (11)  f12 = 0
 (12)  f13 = 0
 (13)  f14 = 0
 (14)  f15 = 0
 (15)  f16 = 0
 (16)  f17 = 0
 (17)  f18 = 0
 (18)  f19 = 0
 (19)  f20 = 0
 (20)  f21 = 0
 (21)  f22 = 0

       F( 21,   122) =    1.46
            Prob > F =    0.1040
```

Note: For the F-tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author’s calculation

Appendix C.4: Output of F-Test (Model 4)

```
. quietly reg c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019 f2-f22

. test f2 f3 f4 f5 f6 f7 f8 f9 f10 f11 f12 f13 f14 f15 f16 f17 f18 f19 f20 f21 f22

 ( 1)  f2 = 0
 ( 2)  f3 = 0
 ( 3)  f4 = 0
 ( 4)  f5 = 0
 ( 5)  f6 = 0
 ( 6)  f7 = 0
 ( 7)  f8 = 0
 ( 8)  f9 = 0
 ( 9)  f10 = 0
 (10)  f11 = 0
 (11)  f12 = 0
 (12)  f13 = 0
 (13)  f14 = 0
 (14)  f15 = 0
 (15)  f16 = 0
 (16)  f17 = 0
 (17)  f18 = 0
 (18)  f19 = 0
 (19)  f20 = 0
 (20)  f21 = 0
 (21)  f22 = 0

       F( 21,   120) =    1.08
            Prob > F =    0.3778
```

Note: For the F-tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix D: Breusch-Pagan Lagrange Multiplier Test

Appendix D.1: Output of Breusch-Pagan Lagrange Multiplier Test (Model 1)

```
. quietly xtreg c_price rg c_assets c_lev c_cr y2014-y2019, re

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        c_price[f_id,t] = Xb + u[f_id] + e[f_id,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                 c_price |    .1714423       .4140559
                       e |    .1561037       .3950996
                       u |           0              0

        Test:   Var(u) = 0
                             chibar2(01) =     0.00
                          Prob > chibar2 =   1.0000
```

Note: For the Breusch-Pagan Lagrange Multiplier tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix D.2: Output of Breusch-Pagan Lagrange Multiplier Test (Model 2)

```
. quietly xtreg c_price eg c_assets c_lev c_cr y2014-y2019, re

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        c_price[f_id,t] = Xb + u[f_id] + e[f_id,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                 c_price |    .1714423       .4140559
                       e |    .1560431       .3950229
                       u |           0              0

        Test:   Var(u) = 0
                             chibar2(01) =     0.00
                          Prob > chibar2 =   1.0000
```

Note: For the Breusch-Pagan Lagrange Multiplier tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix D.3: Output of Breusch-Pagan Lagrange Multiplier Test (Model 3)

```
. quietly xtreg c_price c_prf c_assets c_lev c_cr y2014-y2019, re

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        c_price[f_id,t] = Xb + u[f_id] + e[f_id,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                 c_price |    .1714423       .4140559
                       e |    .1582462       .3978018
                       u |    .0045608       .0675334

        Test:   Var(u) = 0
                             chibar2(01) =     0.86
                          Prob > chibar2 =   0.1773
```

Note: For the Breusch-Pagan Lagrange Multiplier tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author’s calculation

Appendix D.4: Output of Breusch-Pagan Lagrange Multiplier Test (Model 4)

```
. quietly xtreg c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019, re

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

        c_price[f_id,t] = Xb + u[f_id] + e[f_id,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                 c_price |    .1714423       .4140559
                       e |    .1569087       .3961171
                       u |           0              0

        Test:   Var(u) = 0
                             chibar2(01) =     0.00
                          Prob > chibar2 =   1.0000
```

Note: For the Breusch-Pagan Lagrange Multiplier tests, the standard errors of the model are not corrected using robust standard error procedures.
Source: Author’s calculation

Appendix E: Variance Inflation Factor

Appendix E.1: Output of Variance Inflation Factor (Model 1)

```
. quietly reg c_price rg c_assets c_lev c_cr y2014-y2019

. estat vif
```

Variable	VIF	1/VIF
y2015	1.82	0.550625
y2017	1.77	0.566526
y2014	1.76	0.569159
y2019	1.75	0.572671
y2016	1.74	0.573781
y2018	1.74	0.575880
c_cr	1.36	0.737063
c_lev	1.32	0.759872
c_assets	1.19	0.837152
rg	1.17	0.854881
Mean VIF	1.56	

Note: The standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix E.2: Output of Variance Inflation Factor (Model 2)

```
. quietly reg c_price eg c_assets c_lev c_cr y2014-y2019

. estat vif
```

Variable	VIF	1/VIF
y2015	1.81	0.553065
y2014	1.78	0.562354
y2019	1.75	0.569829
y2016	1.75	0.570473
y2018	1.74	0.575217
y2017	1.73	0.578819
c_cr	1.35	0.739490
c_lev	1.32	0.760046
c_assets	1.08	0.925036
eg	1.07	0.933056
Mean VIF	1.54	

Note: The standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix E.3: Output of Variance Inflation Factor (Model 3)

```
. quietly reg c_price c_prf c_assets c_lev c_cr y2014-y2019

. estat vif
```

Variable	VIF	1/VIF
y2015	1.90	0.526568
y2014	1.88	0.532231
y2018	1.87	0.534677
y2019	1.85	0.540490
y2017	1.84	0.543580
y2016	1.81	0.553538
c_lev	1.42	0.703108
c_cr	1.35	0.738803
c_prf	1.21	0.827671
c_assets	1.09	0.915027
Mean VIF	1.62	

Note: The standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix E.4: Output of Variance Inflation Factor (Model 4)

```
. quietly reg c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019

. estat vif
```

Variable	VIF	1/VIF
y2014	1.91	0.523351
y2015	1.91	0.524923
y2017	1.89	0.529532
y2018	1.87	0.533913
y2019	1.86	0.536223
y2016	1.83	0.546778
c_lev	1.44	0.694566
c_cr	1.36	0.736097
c_prf	1.22	0.817412
c_assets	1.21	0.823537
rg	1.21	0.828249
eg	1.11	0.901911
Mean VIF	1.57	

Note: The standard errors of the model are not corrected using robust standard error procedures.
Source: Author's calculation

Appendix F: Heteroscedasticity Test

Appendix F.1: Output of Breusch-Pagan/ Cook-Weisberg Test for Heteroscedasticity (Model 1)

```
. quietly reg c_price rg c_assets c_lev c_cr y2014-y2019

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of c_price

         chi2(1)      =    10.47
         Prob > chi2  =   0.0012
```

Note: For the heteroscedasticity test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix F.2: Output of Breusch-Pagan/ Cook-Weisberg Test for Heteroscedasticity (Model 2)

```
. quietly reg c_price eg c_assets c_lev c_cr y2014-y2019

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of c_price

         chi2(1)      =     6.46
         Prob > chi2  =   0.0111
```

Note: For the heteroscedasticity test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix F.3: Output of Breusch-Pagan/ Cook-Weisberg Test for Heteroscedasticity (Model 3)

```
. quietly reg c_price c_prf c_assets c_lev c_cr y2014-y2019

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of c_price

         chi2(1)      =     2.04
         Prob > chi2  =   0.1536
```

Note: For the heteroscedasticity test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author’s Calculation

Appendix F.4: Output of Breusch-Pagan/ Cook-Weisberg Test for Heteroscedasticity (Model 4)

```
. quietly reg c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of c_price

         chi2(1)      =    14.32
         Prob > chi2  =   0.0002
```

Note: For the heteroscedasticity test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author’s Calculation

Appendix G: Wooldridge Test

Appendix G.1: Output of Wooldridge Test for Serial Correlation (Model 1)

```
. xtserial c_price rg c_assets c_lev c_cr y2014-y2019

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      3.374
           Prob > F =      0.0804
```

Note: For the serial correlation test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix G.2: Output of Wooldridge Test for Serial Correlation (Model 2)

```
. xtserial c_price eg c_assets c_lev c_cr y2014-y2019

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      1.796
           Prob > F =      0.1945
```

Note: For the serial correlation test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix G.3: Output of Wooldridge Test for Serial Correlation (Model 3)

```
. xtserial c_price c_prf c_assets c_lev c_cr y2014-y2019

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      3.193
           Prob > F =      0.0884
```

Note: For the serial correlation test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix G.4: Output of Wooldridge Test for Serial Correlation (Model 4)

```
. xtserial c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,      21) =      2.270
           Prob > F =      0.1468
```

Note: For the serial correlation test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix H: Specification Error Test

Appendix H.1: Ramsey Regression Equation Specification Error Test for Omitted Variables (Model 1)

```
. quietly reg c_price rg c_assets c_lev c_cr y2014-y2019

. estat ovtest

Ramsey RESET test using powers of the fitted values of c_price
       Ho:  model has no omitted variables
                 F(3, 140) =      1.01
                  Prob > F =      0.3926
```

Note: For the specification error test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix H.2: Ramsey Regression Equation Specification Error Test for Omitted Variables (Model 2)

```
. quietly reg c_price eg c_assets c_lev c_cr y2014-y2019

. estat ovtest

Ramsey RESET test using powers of the fitted values of c_price
       Ho:  model has no omitted variables
                 F(3, 140) =      0.48
                  Prob > F =      0.6970
```

Note: For the specification error test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix H.3: Ramsey Regression Equation Specification Error Test for Omitted Variables (Model 3)

```
. quietly reg c_price c_prf c_assets c_lev c_cr y2014-y2019

. estat ovtest

Ramsey RESET test using powers of the fitted values of c_price
       Ho:  model has no omitted variables
                 F(3, 140) =      0.47
                  Prob > F =      0.7026
```

Note: For the specification error test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix H.4: Ramsey Regression Equation Specification Error Test for Omitted Variables (Model 4)

```
. quietly reg c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019

. estat ovtest

Ramsey RESET test using powers of the fitted values of c_price
       Ho:  model has no omitted variables
                 F(3, 138) =      0.73
                  Prob > F =      0.5375
```

Note: For the specification error test, the original standard errors of the model are not corrected using robust standard error procedure.
Source: Author's Calculation

Appendix I: Pooled Ordinary Least Square Estimation

Appendix I.1: Output of Pooled Ordinary Least Square Estimation (Model 1)

```
. cluster2 c_price rg c_assets c_lev c_cr y2014-y2019, tcluster(year) fcluster(f_id)

Linear regression with 2D clustered SEs                 Number of obs =     154
                                                        F( 10,   143) =    3.29
                                                        Prob > F      =  0.0007
Number of clusters (f_id) =      22                     R-squared     =  0.1264
Number of clusters (year) =       7                     Root MSE      =  0.4003
```

c_price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
rg	.8058921	.5339041	1.51	0.133	-.249472	1.861256
c_assets	.4650787	.2996802	1.55	0.123	-.1272969	1.057454
c_lev	.4767882	.1443183	3.30	0.001	.1915153	.7620611
c_cr	.0136614	.0408578	0.33	0.739	-.0671019	.0944246
y2014	-.1475712	.	.	.	.	.
y2015	-.186411	.	.	.	.	.
y2016	-.1445985	.	.	.	.	.
y2017	-.1491398	.0338272	-4.41	0.000	-.2160058	-.0822738
y2018	-.2553673	.036817	-6.94	0.000	-.3281431	-.1825914
y2019	-.1591194	.0637982	-2.49	0.014	-.2852289	-.03301
_cons	.1981123	.0149145	13.28	0.000	.1686309	.2275936

```
     SE clustered by f_id and year
```

Notes: The dependent variable for is stock returns. The standard errors are corrected using double-clustered robust standard errors (Peterson, 2009).
Source: Author's Calculation

Appendix I.2: Output of Pooled Ordinary Least Square Estimation (Model 2)

```
. cluster2 c_price eg c_assets c_lev c_cr y2014-y2019, tcluster(year) fcluster(f_id)

Linear regression with 2D clustered SEs                Number of obs =     154
                                                       F( 10,   143) =    4.68
                                                       Prob > F      =  0.0000
Number of clusters (f_id) =      22                    R-squared     =  0.1077
Number of clusters (year) =       7                    Root MSE      =  0.4046
```

c_price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
eg	.0304374	.0053224	5.72	0.000	.0199166	.0409582
c_assets	.7167596	.2129379	3.37	0.001	.2958468	1.137672
c_lev	.6274697	.196207	3.20	0.002	.239629	1.01531
c_cr	.00207	.0273244	0.08	0.940	-.0519419	.056082
y2014	-.1765961	.	.	.	.	.
y2015	-.2100685	.	.	.	.	.
y2016	-.153761	.	.	.	.	.
y2017	-.1008402	.	.	.	.	.
y2018	-.2406924	.	.	.	.	.
y2019	-.1570918	.0578583	-2.72	0.007	-.2714599	-.0427237
_cons	.2180673	.0278177	7.84	0.000	.1630803	.2730543

SE clustered by f_id and year

Notes: The dependent variable for is stock returns. The standard errors are corrected using double-clustered robust standard errors (Peterson, 2009).
Source: Author's Calculation

Appendix I.3: Output of Pooled Ordinary Least Square Estimation (Model 3)

```
. cluster2 c_price c_prf c_assets c_lev c_cr y2014-y2019, tcluster(year) fcluster(f_id)

Linear regression with 2D clustered SEs                Number of obs =     154
                                                       F( 10,   143) =    2.41
                                                       Prob > F      =  0.0113
Number of clusters (f_id) =      22                    R-squared     =  0.0789
Number of clusters (year) =       7                    Root MSE      =  0.4111
```

c_price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
c_prf	.0707071	.1240304	0.57	0.570	-.1744629	.315877
c_assets	.7540783	.2100537	3.59	0.000	.3388669	1.16929
c_lev	.4927592	.249609	1.97	0.050	-.0006409	.9861593
c_cr	.0012417	.0301112	0.04	0.967	-.0582788	.0607621
y2014	-.1285166	.	.	.	.	.
y2015	-.1944152	.	.	.	.	.
y2016	-.1167345	.	.	.	.	.
y2017	-.0810677	.0230527	-3.52	0.001	-.1266357	-.0354996
y2018	-.2318749	.0252299	-9.19	0.000	-.2817465	-.1820032
y2019	-.1680972	.0668752	-2.51	0.013	-.3002889	-.0359055
_cons	.1996874	.0402107	4.97	0.000	.1202032	.2791717

```
     SE clustered by f_id and year
```

Notes: The dependent variable for is stock returns. The standard errors are corrected using double-clustered robust standard errors (Peterson, 2009).
Source: Author's Calculation

Appendix I.4: Output of Pooled Ordinary Least Square Estimation (Model 4)

```
. cluster2 c_price rg eg c_prf c_assets c_lev c_cr y2014-y2019, tcluster(year) fcluster(f_id)

Linear regression with 2D clustered SEs              Number of obs =      154
                                                     F( 12,   141) =     4.54
                                                     Prob > F      =   0.0000
Number of clusters (f_id) =      22                  R-squared     =   0.1464
Number of clusters (year) =       7                  Root MSE      =   0.3985
```

c_price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
rg	.7171872	.4868884	1.47	0.143	-.2453577	1.679732
eg	.0245326	.0054673	4.49	0.000	.0137242	.035341
c_prf	.024675	.0977394	0.25	0.801	-.1685491	.2178991
c_assets	.4853371	.2971972	1.63	0.105	-.1022014	1.072876
c_lev	.5148568	.21309	2.42	0.017	.0935925	.9361211
c_cr	.0117382	.0378236	0.31	0.757	-.0630364	.0865128
y2014	-.1655104	.	.	.	.	.
y2015	-.1837412	.	.	.	.	.
y2016	-.1575181	.	.	.	.	.
y2017	-.1396336	.0381267	-3.66	0.000	-.2150075	-.0642597
y2018	-.2402577	.045391	-5.29	0.000	-.3299926	-.1505229
y2019	-.1331383	.0670393	-1.99	0.049	-.2656705	-.0006062
_cons	.1957625	.0332791	5.88	0.000	.129972	.2615531

SE clustered by f_id and year

Notes: The dependent variable for is stock returns. The standard errors are corrected using double-clustered robust standard errors (Peterson, 2009).
Source: Author's Calculation