



Faculty of Economics and Business

**Examining the Impacts of Dividend Payout and Share Repurchase to
Future Firm Performance: Evidence from Malaysian Public Listed Firms**

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Examining the Impacts of Dividend Payout and Share Repurchase to Future
Firm Performance: Evidence from Malaysian Public Listed Firms

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DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Malaysia Sarawak. Except where due acknowledgements have been made, the work is that of the author alone. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.



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ABSTRACT

Signaling theory is built on the premise that information asymmetry exists between managers and investors. The information content hypothesis, also known as the information signaling hypothesis, contends that corporate payout policy functions as a signaling tool to reflect an optimistic view of firm prospects to investors. Nevertheless, the action of payout has long been criticized for sending weak signals that mislead investors through price manipulation. Therefore, this study intends to investigate the information content of corporate payout policy in Malaysia by examining the impacts of dividend payout and share repurchase on future firm performance. This study is conducted within the sample period of 2000 to 2020, with the sample data comprising 355 dividend paying firms, 153 share repurchasing firms and 144 mutual payers listed on Bursa Malaysia. Panel data regression analysis is conducted to investigate the influence of the respective payout policy on future firm performance as represented by the proxies of earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow measured in the following year of payout. The results from the fixed effect model show a positive and significant relationship between share repurchase ratio and all proxies of future firm performance, which supports the information signaling hypothesis. In addition, the predictive ability of share repurchases on future firm performance is also proven among subsamples of share repurchasing firms with small market capitalization and high payout frequency. On the other hand, the results from the fixed effect model show an insignificant relationship between dividend ratio and all proxies of future firm performance, which rejects the information content hypothesis. However, the predictive power of dividends on future firm performance is observed among subsamples of dividend paying firms with large market capitalization and regular dividend payments. Meanwhile, the total payout ratio for mutual payers is only positively and

significantly related to future return on assets and future operating income. Overall, the results suggest that corporate payout policy does indeed convey valuable information about future profitability among Malaysian public listed firms. The real earnings improvement demonstrated in the current study thus resolves the issue of false market signals originating from dividends and share repurchases.

Keywords: Signaling theory, dividend, share repurchase, future firm performance, Malaysia

***Pengkajian Kesan Pembayaran Dividen dan Pembelian Balik Saham terhadap Prestasi
Firma Masa Hadapan: Bukti daripada Fima Senarai Awam Malaysia***

ABSTRAK

Teori isyarat dibina atas premis bahawa asimetri maklumat wujud antara pengurus dan pelabur. Hipotesis kandungan maklumat, juga dikenali sebagai hipotesis isyarat maklumat, berpendapat bahawa dasar pembayaran korporat berfungsi sebagai alat isyarat untuk mencerminkan pandangan optimistik prospek firma kepada pelabur. Namun begitu, tindakan pembayaran telah lama dikritik kerana menghantar isyarat lemah yang mengelirukan pelabur melalui manipulasi harga. Oleh itu, kajian ini berhasrat untuk menyiasat kandungan maklumat dasar pembayaran korporat di Malaysia dengan mengkaji kesan pembayaran dividen dan pembelian balik saham ke atas prestasi firma masa hadapan. Kajian ini dijalankan dalam tempoh sampel 2000 hingga 2020, dengan data sampel terdiri daripada 355 firma pembayar dividen, 153 firma pembelian semula saham dan 144 pembayar bersama disenaraikan di Bursa Malaysia. Analisis regresi data panel dijalankan untuk menyiasat pengaruh dasar pembayaran masing-masing terhadap prestasi firma masa hadapan seperti yang diwakili oleh proksi pendapatan sesaham, hasil pendapatan, pulangan atas aset, pulangan atas ekuiti, pendapatan operasi dan aliran tunai operasi yang diukur pada tahun pembayaran berikutnya. Keputusan daripada model kesan tetap menunjukkan hubungan yang positif dan signifikan antara nisbah belian balik saham dan semua proksi prestasi firma masa hadapan, maka menyokong hipotesis isyarat maklumat. Di samping itu, keupayaan ramalan pembelian balik saham pada prestasi firma masa hadapan juga terbukti dalam kalangan subsampel firma pembelian semula saham dengan permodalan pasaran yang kecil dan kekerapan pembayaran yang tinggi. Sebaliknya, keputusan daripada model kesan tetap menunjukkan hubungan yang tidak ketara antara nisbah dividen dan semua

proksi prestasi firma masa hadapan, maka menolak hipotesis kandungan maklumat. Walau bagaimanapun, kuasa ramalan dividen ke atas prestasi firma masa hadapan diperhatikan dalam kalangan subsampel firma yang membayar dividen dengan permodalan pasaran yang besar dan pembayaran dividen tetap. Sementara itu, jumlah nisbah pembayaran untuk pembayar bersama hanya berkaitan secara positif dan signifikan dengan pulangan aset dan pendapatan operasi masa hadapan pada masa hadapan. Secara keseluruhan, keputusan menunjukkan bahawa dasar pembayaran korporat sememangnya menyampaikan maklumat berharga tentang keuntungan masa depan dalam kalangan firma senarai awam Malaysia. Peningkatan pendapatan sebenar yang ditunjukkan dalam kajian ini menyelesaikan isu isyarat pasaran palsu yang berpunca daripada dividen dan pembelian balik saham.

Kata kunci: *Teori isyarat, dividen, pembelian balik saham, prestasi firma masa hadapan, Malaysia*

TABLE OF CONTENTS

	Page
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
ABSTRAK	v
TABLE OF CONTENTS	vii
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xiv
CHAPTER 1 INTRODUCTION	1
1.1 Chapter Overview	1
1.2 Introduction	1
1.3 Background of the Study	4
1.4 Problem Statement	9
1.5 Research Questions	12
1.6 Research Objectives	12
1.7 Significance of the Study	13
1.8 Scope of the Study	14

1.9	Operational Definitions	15
1.10	Chapter Summary	16
CHAPTER 2 LITERATURE REVIEW		18
2.1	Chapter Overview	18
2.2	Signaling Theory	18
2.3	Information Content Hypothesis for Dividend: Significant Results	21
2.4	Information Content Hypothesis for Dividend: Insignificant Results	30
2.5	Information Signaling Hypothesis for Share Repurchase: Significant Results	38
2.6	Information Signaling Hypothesis for Share Repurchase: Insignificant Results	43
2.7	Chapter Summary	51
CHAPTER 3 METHODOLOGY		54
3.1	Chapter Overview	54
3.2	Data Description	54
3.3	Research Framework	55
3.4	Empirical Model	58
3.5	Variables Definition	60
3.6	Hypothesis Setting	65
3.7	Panel Data Analysis	67
3.7.1	Random Effect Model	69
3.7.2	Fixed Effect Model	70

3.8	Diagnostic Checks	70
3.8.1	Multicollinearity	71
3.8.2	Heteroskedasticity	72
3.8.3	Serial Correlation	73
3.9	Sensitivity Tests	73
3.9.1	Financial Crisis	74
3.9.2	Market Index	75
3.9.3	Payout Frequency	76
3.9.4	Alternative Explanatory Variable	77
3.10	Chapter Summary	78
	CHAPTER 4 RESULT AND DISCUSSION	79
4.1	Chapter Overview	79
4.2	Descriptive Statistics	79
4.3	Correlation Test	82
4.4	Results of Panel Data Analysis for Dividend	85
4.5	Results of Panel Data Analysis for Share Repurchase	95
4.6	Results of Panel Data Analysis for Mutual Payer	106
4.7	Sensitivity Analysis	116
4.7.1	Exclusion of Crisis Period	116
4.7.2	Small Cap Index vs Top 100 Index	123

4.7.3	Top 25% vs Bottom 25% Payout Frequency	138
4.7.4	Dividend Payout Ratio vs Buyback Ratio	151
4.8	Chapter Summary	157
CHAPTER 5 CONCLUSION		159
5.1	Conclusions	159
5.2	Research Implications	162
5.3	Limitations of the Study	164
5.4	Recommendations for Future Study	165
REFERENCES		166
APPENDICES		176

LIST OF TABLES

	Page
Table 1.1 Operational Definitions	15
Table 3.1 Definition of Variables	64
Table 1.1 Descriptive Statistics for Dividend Sample	80
Table 4.2 Descriptive Statistics for Share Repurchase Sample	81
Table 4.3 Descriptive Statistics for Mutual Payer	82
Table 4.4 Correlation Matrix for Dividend Sample	83
Table 4.5 Correlation Matrix for Share Repurchase Sample	84
Table 4.6 Correlation Matrix for Mutual Payer	84
Table 4.7 Results of Panel Data Analysis for Equation 3.1	93
Table 4.8 Results of Panel Data Analysis for Equation 3.2	104
Table 4.9 Results of Panel Data Analysis for Equation 3.3	114
Table 4.10 Regression Results between Dividend and Future Firm Performance with Exclusion of Crisis Period 2008-2009	119
Table 4.11 Regression Results between Share Repurchase and Future Firm Performance with Exclusion of Crisis Period 2008-2009	121
Table 4.12 Regression Results between Dividend and Future Firm Performance under FTSE Bursa Malaysia Small Cap Index	126
Table 4.13 Regression Results between Dividend and Future Firm Performance under FTSE Bursa Malaysia Top 100 Index	128
Table 4.14 Regression Results between Share Repurchase and Future Firm Performance under FTSE Bursa Malaysia Small Cap Index	134
Table 4.15 Regression Results between Share Repurchase and Future Firm Performance under FTSE Bursa Malaysia Top 100 Index	136
Table 4.16 Regression Results between Dividend and Future Firm Performance for Top 25% Payout Frequency	141
Table 4.17 Regression Results between Dividend and Future Firm Performance for Bottom 25% Payout Frequency	143

Table 4.18	Regression Results between Share Repurchase and Future Firm Performance for Top 25% Payout Frequency	147
Table 4.19	Regression Results between Share Repurchase and Future Firm Performance for Bottom 25% Payout Frequency	149
Table 4.20	Regression Results between Dividend and Future Firm Performance with Proxy of Dividend Payout Ratio	153
Table 4.21	Regression Results between Share Repurchase and Future Firm Performance with Proxy of Buyback Ratio	155

LIST OF FIGURES

	Page
Figure 1.1 Trend of Dividend Payments in Malaysia	7
Figure 1.2 Trend of Share Buybacks in Malaysia	8
Figure 3.1 Research Framework of the Study	57

LIST OF ABBREVIATIONS

U.S.	United States
UK	United Kingdom
OLS	Ordinary least square
VIF	Variance inflation factor
EPS	Earnings per share
ROA	Return on assets
ROE	Return on equity

CHAPTER 1

INTRODUCTION

1.1 Chapter Overview

This chapter focuses on the introduction to the study, which briefly explains the corporate payout policy of dividend and share repurchase. The next section includes the background of the study, which illustrates the trend of payout policy and the research issue found from reviewing the condition of corporate payout in Malaysia, which then leads to the problem statement. Research questions and research objectives for the study will be covered in the following section. Subsequently, the significance and scope of the study will be elaborated, while operational definitions for the key terms used in this study are included in the last section.

1.2 Introduction

A company's profit can be retained for future investment, used to repay debt or distributed back to shareholders. There are two main ways in which a company returns profits to its shareholders: cash dividends and share buybacks. Shareholders invest in publicly traded companies for capital appreciation and income. The reasons that drive the strategic decision on dividends versus share buybacks differ from company to company and are based on several factors, such as the company's current stock price, its long-term vision, the tax structure applicable to the company and its shareholders, the message the company wants to give the stakeholders, investment opportunities, etc (Graham, Adam & Gunasingham, 2021).

Dividends are the proportional cash distribution of a fraction of the firm's after-tax profit to the shareholders. Large and established corporations typically disburse a major portion of their profits as dividends. The size and pattern of dividend payouts are decided by the board of directors and listed under a firm's dividend policy. The final dividend is usually declared during the annual general meeting and paid at the end of the fiscal year. The interim dividend, on the other hand, is announced and paid out in the middle of the fiscal year. Firms with stable earnings prefer to pay cash dividends at regular intervals, but special dividends can occasionally be issued (Parrino, Bates, Gillan & Kidwell, 2018).

Cash-rich companies pay dividends to keep shareholders interested in their stock, and it is a common method of returning surplus cash to investors. Cash dividend provides a regular stream of cash for investors. It allows the shareholder to remain invested in the company and still receive regular cash flows. Cash dividend can be a big incentive for investors who rely heavily on their investments to meet their living expenses, especially retired investors who may not have another source of income (Parrino et al., 2018).

A share repurchase, alternatively referred to as a share buyback, is the process of buying back a company's shares from its shareholders (Graham et al., 2021). According to Vermaelen (2005), there are five types of share repurchase: open market repurchase, Dutch auction tender offer, fixed price tender offer, repurchase involving derivatives and negotiated repurchase from private investors. The most common method being practiced is open market repurchase, whereby firms get to repurchase shares from the market with the help of a broker. As for a fixed price tender offer, a company typically offers a specific price for a certain quantity of shares to all shareholders for a limited period. In contrast, the Dutch auction offer specifies a range of prices to allow every tendering stockholder to select the minimum price

that could be accepted to sell their shares. The Greenmail transaction serves as one of the well-known direct negotiations whereby the company pays a premium higher than the market price to the potential raider, usually to cease certain takeover intentions. In the meantime, repurchasing shares with derivatives is far less common than other alternatives but can be conducted through buying collars or forward contracts and writing put options (Vermaelen, 2005).

Share repurchase prevents a decline in the value of a stock by reducing the supply of the stock. With the reduction in outstanding shares, the earnings per share of the company improves. This is a good indication of the company's profitability and may boost its share price in the long run. Besides, share repurchase is often used as a strategy by management to show its confidence in the company and to send a message that the stock is undervalued (Graham et al., 2021). Moreover, share repurchases exhibit greater flexibility as compared to dividends. Firms are not obliged to conduct share repurchases even after announcing the share buyback plan. On the other hand, dividends require consistent firm commitment and are more rigid as any adjustment to the size of the dividend payment will easily induce an adverse market reaction (Parrino et al., 2018).

A corporate payout policy outlines the amount, mode and method of profit distribution to shareholders (Graham et al., 2021). Asquith and Mullins (1986) asserted that one of the most confusing and disturbing issues in corporate finance would be how to return capital to shareholders. A sound and prudent payout policy is crucial due to its strategic implications for investment and financing decisions. For instance, if a firm decides not to pay or pays fewer dividends, it will retain more internal earnings, thus reducing its reliance on external earnings. If a firm pays high dividends, it will have less internal earnings, thus

increasing the firm's dependence on debt or other external financing. This implies that the decision to raise funds is directly associated with the dividend policy. As dividend policy influences the capital structure of a firm, it will also have an impact on the investment decision and cost of capital of the company. Meanwhile, growth in cash flows, earnings and the rate of return on shareholder investment can be magnified through timely share repurchase activity (Graham et al., 2021; Parrino et al., 2018).

1.3 Background of the Study

The distribution of dividends in Malaysia is not governed by any specific rules. Companies are free to set their own dividend policy, subject to compliance with the Companies Act 2016. According to Section 131 of the Companies Act 2016 in Malaysia, a company may only pay a dividend from its earnings if it is in a good financial position at the time of distribution. Section 132 of the Act states that the company's directors, who authorized the dividend payments, must ensure that the company will remain solvent even after paying dividends. The company is regarded as solvent if it can pay its debts as and when they fall due within twelve months immediately after the dividend is paid. The single-tier tax system in Malaysia allows for the exemption of personal income tax on dividends received by shareholders since the dividend is distributed after corporate tax deduction on the normal chargeable income of a company. Meanwhile, a share repurchase is subject to capital gain tax, in which the sale of appreciated shares is only taxed when sold.

Share repurchase activities were observed in the United States (U.S.) since the early 1980s and then quickly spread to the United Kingdom (UK) and Canada in the 1990s. Subsequently, other countries that had previously forbidden share repurchase began to permit such transactions. For instance, share repurchase was legalized in Hong Kong in

1991, Japan and Korea in 1994, and Finland in 1997. Meanwhile, France, Germany and Singapore authorized share repurchase in 1998. Following that, Norway, India and South Africa allowed share buybacks in 1999, while Taiwan, Denmark and Sweden permitted them in 2000. In Malaysia, it was not legal to buy back shares until September 1, 1997. This was done to keep stock prices stable and help the country recover from the Asian Financial Crisis of 1997, which had impacted asset prices on the Kuala Lumpur Stock Exchange and caused the Malaysian ringgit to depreciate in value.

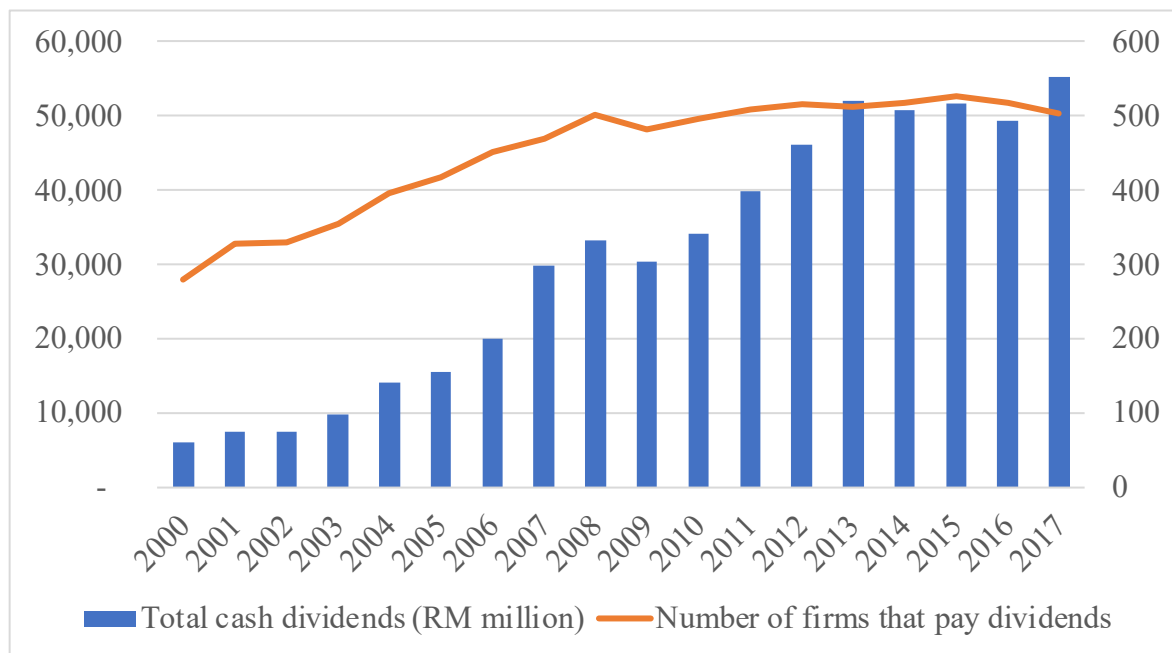
In the context of the Malaysian market, only open market repurchase is allowed, as stated under Chapter 12 Share Buyback Listing Requirements of Bursa Malaysia. The regulations on share repurchase in Malaysia are rather strict compared to other countries, as there are various restrictions set, including controlling the timing, price and volume of transactions and complying with the reporting requirements. Shareholder approval is required before initiating the share repurchase program, which can be obtained at an annual general meeting or an extraordinary meeting. This approval is only valid for one year, and any share repurchase that is not completed within the stipulated period may need to apply for new approval. Following that, a listed corporation must buy back its own shares from the open market using the automated trading system at the current market price, with no direct business transactions. The amount of the share repurchase should not be more than 10% of the prevailing ordinary shares. The price offered should not exceed 15 percent of the shares' weighted average market price, calculated from five consecutive market days prior to the buyback. Besides, listed corporations that buy back shares must notify the exchange in writing of the details of the transactions before 6.30 p.m. on the day the buyback was made. The immediate announcement of the share buyback must include basic information such as

the total number of shares purchased, the minimum and maximum price paid for each share purchased and the total consideration paid for the repurchased shares.

As stated under Section 123 of the Companies Act 2016 in Malaysia, a company is not permitted to purchase its own shares or those of its holding company unless it is a redemption of preference shares, a cancellation of shares, a share buyback by public listed companies or a remedy awarded by the court in a case of oppression. Section 127 states that a company is allowed to purchase its own shares only when the company is solvent at the date of the purchase and the purchase is made in good faith and in the interests of the company and is made through the stock exchange on which the shares of the company are quoted. Meanwhile, Section 127(4) claimed that a company that has purchased its own shares may cancel or retain the shares purchased as treasury shares or retain part of the shares and cancel the remainder of the shares. Section 127(7) stipulates that the treasury shares held by a company may be distributed as dividends to shareholders or to resell, transfer or cancel the shares or any of the shares. The cancellation of treasury shares will boost earnings per share, while the reselling of treasury shares will yield profits for the company.

Dividend payment was a signal of companies' financial health. If they raise dividends, then it is a positive signal (Yusof & Ismail, 2016). The basic principle of share buybacks is that the company feels the valuation of the shares is so low compared with the underlying value that it presents a compelling reason to buy the shares using unencumbered cash. So, when a company buys back its own shares, it is a clear signal to the market that the shares are undervalued (Lee & Isa, 2015). Although both share repurchase and cash dividend are thought to be costly signals, many companies still choose to do so because of their information content, especially during times of financial crisis. Due to the impact of the

financial crisis, investors have lost confidence in the market, and many companies repurchase their shares and pay cash dividends to attract investors, as reflected by the active trends of payout during the financial crisis period of 2008, as shown in Figures 1.1 and 1.2.

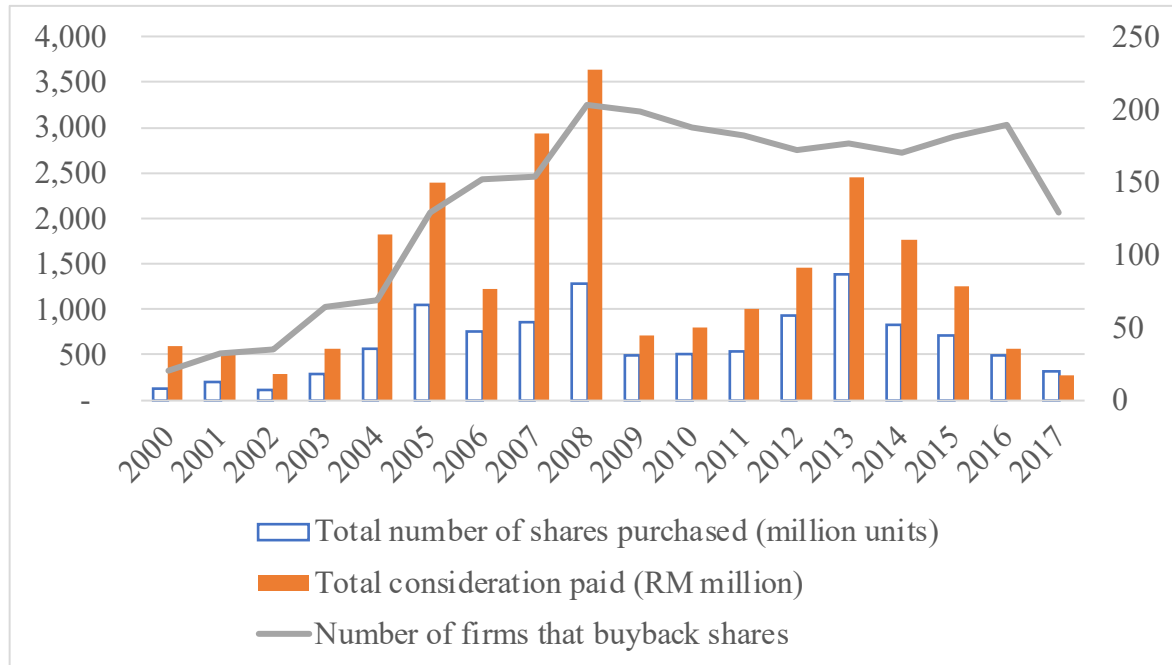


Source: Data Stream

Figure 1.1: Trend of Dividend Payments in Malaysia

Figure 1.1 shows the trend of dividend payments among public listed companies in Malaysia from 2000 to 2017. The chart shows an increasing trend of dividend payments from 2003 to 2008, with the highest cash dividends of about RM33 billion paid in 2008, particularly due to the subprime mortgage crisis in 2008. After that, the dividend payments dropped slightly to about RM30 billion in 2009, followed by a rising trend of dividend payments until 2013. Subsequently, the amount of cash dividends paid was maintained at around RM50 billion from 2014 to 2016 and then increased to RM55 billion in 2017. Besides, the number of firms that pay dividends has grown from less than 200 firms recorded in 2000 to roughly 500 firms in 2017. Overall, the chart depicts an emerging trend of

dividend payments among Malaysian public listed companies over the period of 2000 to 2017.



Source: Bursa Malaysia

Figure 1.2: Trend of Share Buybacks in Malaysia

Figure 1.2 shows the trend of share buybacks among public listed companies in Malaysia from 2000 to 2017. The chart shows that the number of firms involved in share buyback activities has increased since 2000, with the highest number of firms recorded in 2008, probably because of the subprime mortgage crisis that affected the Malaysian stock market indirectly and caused more Malaysian firms to buy back shares to stabilize their share prices. This phenomenon is in conjunction with the total number of shares purchased and the total consideration paid in the market. The highest consideration of about RM3,600 million was paid for a total of approximately 1,300 million shares purchased in 2008. Following that, the total number of shares purchased plunged to roughly 500 million units, with about RM700 million of consideration paid in 2009. Subsequently, share buyback activities grew constantly until 2013, when approximately RM2,500 million was spent to buy back about

1,400 million shares from the market. Thereafter, share buybacks were on a declining trend from 2014 to 2017. In 2017, only about 300 million units of shares were purchased, which cost approximately RM300 million.

1.4 Problem Statement

Signaling theory can be divided into two versions: the market undervaluation hypothesis and the information content hypothesis, which are often mistaken for one another. The market undervaluation hypothesis states that management disagrees with the company's current market value as indicated by the prevailing stock price. Hence, dividends or share repurchases are declared to signal stock undervaluation in an inefficient market (Dittmar, 2000; Baker & Weigand, 2015). While undervaluation is often explained by the correlation between payout and past returns, the problem with this approach is that past returns are backward-looking measures of performance and cannot detect undervaluation with respect to managers' private information concerning prospective firm events.

Building on the notion of asymmetric information, Bhattacharya (1979), Vermaelen (1981) and Miller and Rock (1985) theorized that managers purposely deliver explicit signals about the future earnings of a firm through payout decisions at the cost of the management level. Therefore, the information content hypothesis, also known as the information signaling hypothesis, contends that management uses corporate payouts to signal better prospects (Miller & Modigliani, 1961). The information content hypothesis is usually related to dividends (Choi, Joo & Park, 2011; Nissim & Ziv, 2001), while the information signaling hypothesis is typically associated with share repurchases (Huang, Liano & Pan, 2010; Lie, 2005). Despite different terms being used, however, both

hypotheses portray a similar definition in reflecting management's optimistic view of the firms' future earnings and cash flow position (Dann, 1981; Miller & Rock, 1985).

Since the proposal of the information content hypothesis, numerous studies have focused on investigating the association between payout policies and future earnings, especially in the developed market, yet no consistent conclusion has been derived regarding this issue. The empirical findings for the impacts of dividends and share repurchases on the future earnings of firms have been mixed. Previous studies on the information content of dividends mainly focused on examining the effect of dividend changes on future earnings changes. Nissim and Ziv (2001) and Zhou and Ruland (2006) proved the information content hypothesis of dividends, whereas Benartzi, Michaely and Thaler (1997) and Grullon, Michaely, Benartzi and Thaler (2005) refuted this hypothesis. On the other hand, most of the prior research on the information signaling of share repurchases concentrated on using univariate analysis to observe the variation in operating performance subsequent to the announcement of a share repurchase. Jagannathan and Stephens (2003) and Lie (2005) found evidence that was consistent with the information signaling hypothesis of share repurchases, but Evans and Evans (2001) and Huang et al. (2010) did not find any improvement in earnings after share repurchases. In the Malaysian context, studies on the relationship between dividends and future earnings are limited (Lee, Isa & Lim, 2012), while there is no known research regarding the predictive ability of share repurchases on future firm performance.

Despite the prospective signaling role of payout policy in signifying future firm performance, the action of payout has long been criticized for sending weak signals that mislead investors through price manipulation. A rich literature argues that stock repurchases

often serve as positive economic signals beneficial to investors (Isa & Lee, 2014; Lim & Bacha, 2002). Yet due to their inherent flexibility, open market repurchase programs are deemed to be weak signals lacking commitment (Vermaelen, 1981; Comment and Jarrell, 1991). Share buybacks have been practiced by many companies during the peak of the global economic crisis. The sharp decline in stock market due to external uncertainties from economic shock led to increasing share buyback activities in Malaysia (Toh, 2019). The action of share buybacks is believed to be positive as they help to stabilize the market in a volatile environment. However, it was claimed that companies tend to use share buybacks to manipulate stock prices, especially when managers are seemingly under heavy pressure to boost stock prices, they might have announced a repurchase only to convey a false signal (Bonaime & Vermaelen, 2022). In the views of Malaysia's Minority Shareholders Watch Group (2020): If a company buys back its shares for the sole purpose of stabilizing its share price regardless of the intrinsic value, such action could be tantamount to creating a false market, an offence under the securities laws.

The above commentary, together with the inconclusive results on the information content hypothesis, typically in the context of a developing market, provides the motivation for this line of research. Following the argument of false signals, we wish to evaluate whether dividends and share repurchases are potentially used by managers to mislead investors or to indicate real earnings growth in the future. As it is not specifically mentioned under the information content hypothesis or the information signaling hypothesis which performance metric the managers wish to communicate to the investors, it is, therefore, significant to test the predictive ability of corporate payout policy towards firm prospects with different earnings indicators measured from multiple perspectives. Hence, the current study intends

to fill the research gap by examining the impact of dividend payout and share repurchase on future firm performance in the context of Malaysian public listed companies.

1.5 Research Questions

The research questions for the current study intend to answer whether dividends and share repurchases among Malaysian public listed firms serve as false signals to mislead investors. This is done by examining the impacts of corporate payout policies in Malaysia on future firm performance to test whether there is any real improvement in firm earnings following dividend payout and share repurchase. With that, the following research questions are raised:

- i) Are dividends capable of predicting future firm performance among dividend payers in Malaysia?
- ii) Are share repurchases capable of predicting future firm performance among share repurchasers in Malaysia?
- iii) Are total payouts capable of predicting future firm performance among mutual payers in Malaysia?

1.6 Research Objectives

General objective:

To study the information content of corporate payout policies in Malaysia.

Specific objectives:

- i) To examine the relationship between dividend and future firm performance among dividend payers.

ii) To investigate the relationship between share repurchase and future firm performance among share repurchasers.

iii) To assess the relationship between total payout and future firm performance among mutual payers.

The general objective of the current study is to study the information content of corporate payout policies in Malaysia. As contended by the information content hypothesis, payout decisions contain explicit signals sent intentionally by the firm's management to signify the prospects of the firm to investors (Bhattacharya, 1979; Miller & Modigliani, 1961; Miller & Rock, 1985). As two primary payout methods are being practiced among Malaysian firms, the specific objectives for the current study shall be divided into two parts. The first specific objective is to examine the relationship between dividend and future firm performance to test whether future firm performance is predictable based on the size of the current dividend payment. The second specific objective is to investigate the relationship between share repurchase and future firm performance to test whether future firm performance is predictable based on the size of the current share buyback. Meanwhile, the third objective focuses on assessing the relationship between total payout and future firm performance to test whether future firm performance is predictable based on the size of total payout, which includes both dividend and share repurchase.

1.7 Significance of the Study

From a theoretical perspective, findings from the current study could contribute to the literature by confirming previous research, as this study is motivated by the occurrence of different research results. The current study's findings will make a significant contribution to signaling theory, especially in the context of developing markets. The result of this

research will also add to the existing literature on the information content of dividends and the information signaling of share repurchases.

From a practitioner's viewpoint, dividends or share buybacks are not only a means of regular income for investors but also an important input into the valuation of firm. The findings from the current study shall serve as a reference for investors about the occurrence of real intrinsic value in firms following dividend payouts or share buybacks. Despite the efficient market hypothesis, which states that all relevant information has been fully incorporated into stock prices and there is no possibility to earn abnormal profit, the information content of dividend and share repurchase towards future firm performance still serves as useful information for investors in strategizing their investment plan through clarification on the probability of false signals declared by dividend and share repurchase.

1.8 Scope of the Study

The main purpose of the current study is to examine the impacts of dividend payout and share repurchase on future firm performance. This research is designed to assess whether earnings improvement really exists following corporate payout so as to discuss the validity of the information content hypothesis under the signaling theory. The sample data shall comprise public listed companies in Malaysia that are active and involved in dividend payouts and share buybacks from 2000 to 2020. The research method of panel data analysis will be employed in the current study to investigate the relationship between respective payout policy and future firm performance. The dependent variables shall consist of a list of proxies that represent future firm performance, which include earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow, all measured in the following year of payout. Meanwhile, the independent variables shall

consist of the two payout methods practiced in Malaysia, which are the dividend payout and share repurchase apart from the total payout, which involves mutual payers.

1.9 Operational Definitions

Dividends are generally defined as the proportional cash distribution of a fraction of the firm's profit to shareholders (Graham et al., 2021). The term dividend in this study refers to the common dividend paid to shareholders of the company. Share repurchase, also known as share buyback is the reacquisition by a company of its own shares (Graham et al., 2021). The term share repurchase in the current study is represented by the consideration paid by firms when buying back shares from their shareholders. Meanwhile, the term total payout indicates the combination of both cash dividends and consideration paid for share buybacks.

Future firm performance signifies the profitability of the firm in terms of financial and operational performance measured in the first year subsequent to a dividend payment or share repurchase. The term dividend payer refers to public listed companies that pay dividends, whereas share repurchaser indicates public listed companies that engage in share buyback activities. Meanwhile, the term mutual payer refers to public listed companies that both pay dividends and buy back shares.

Table 1.1: Operational Definitions

Term	Operational Definitions
Dividend	Common dividends paid to shareholders of the company
Share repurchase	Consideration paid by firms for repurchasing shares from shareholders
Total payout	Combination of cash dividends and consideration paid for share buybacks

Table 1.1 continued

Future firm performance	Profitability of firms measured in the first year following dividend or share repurchase
Dividend payer	Public listed firms that pay dividends
Share repurchaser	Public listed firms that buy back shares
Mutual payer	Public listed firms that involve in both dividend payout and share repurchase

1.10 Chapter Summary

There are two major components of corporate payout policy, which consist of dividend and share repurchase. Dividend is defined as the proportional distribution of a company's profit to shareholders in terms of cash, while share repurchase refers to the process of buying back a company's own shares from the market (Graham et al., 2021). A review of the trend of corporate payout policy in Malaysia generally shows an increasing trend for both dividend payment and share repurchase along the period of 2000 to 2017 and was apparently obvious during the financial crisis period of 2008. During the recession period, the pressure of lifting stock prices through payout policy raises the concern of whether false signals exist that mislead investors or there is actual improvement in firm performance in the future.

The information content hypothesis, which is under the signaling theory, claims that firms tend to use dividends or share repurchases as a signal of future improvement in firms' earnings (Miller & Modigliani, 1961). In order to clarify the relationship between corporate payout policies and firms' prospects, this study will examine the impact of dividend payout and share repurchase on future firm performance. The findings from this study shall

contribute to existing literature on signaling theory and also serve as a reference for investors in formulating their investment strategies.

CHAPTER 2

LITERATURE REVIEW

2.1 Chapter Overview

This chapter begins with a historical review of the signaling theory, which forms the information content hypothesis. The research investigating the relationship between dividends and future profitability is usually related to the information content hypothesis. Meanwhile, studies on the relationship between share repurchases and future profitability are usually associated with the information signaling hypothesis. Nonetheless, both the information content hypothesis and the information signaling hypothesis state that firms pay dividends or buy back shares to signal management's optimism about future profitability (Miller & Modigliani, 1961). In the following subsections, prior studies examining the information content of dividends and share repurchases will be reviewed according to the significance of the results.

2.2 Signaling Theory

Information asymmetry occurs when not all information is equally available to all parties simultaneously. Insiders often possess better private information than outsiders. Based on this assumption, signaling theory states that corporate payout policies are often used to signal investors about such asymmetries (Bhattacharya, 1979; Vermaelen, 1981). Signaling theory can be divided into two different versions: the market undervaluation hypothesis and the information content hypothesis, which have sometimes been mistaken for one another.

The market undervaluation hypothesis relates to the mispricing of a firm's prevailing stock price. In the opinion of the management, the current stock price does not adequately reflect the underlying value of the company and is subject to undervaluation (Dittmar, 2000; Jagannathan & Stephens, 2003). The market undervaluation hypothesis is usually tested by employing event study methodology to capture the market sentiment in response to the announcement of a corporate payout policy (Baker & Weigand, 2015; Dittmar, 2000; Lee, Ejara & Gleason, 2010).

On the other hand, the information content hypothesis, also known as the information signaling hypothesis, reflects management's attempt to signal information regarding improvements in the firm's future earnings and cash flow position (Lintner, 1956; Dann, 1981). The information content hypothesis is tested by examining the association between corporate payout policies and future earnings (Chen & Kao, 2014; Lie, 2005; Nissim & Ziv, 2001). There are abundant studies on the market undervaluation hypothesis, while past academic researchers have often overlooked the information content hypothesis. Therefore, the focus of this study will be on the information content hypothesis.

Lintner (1956) described dividend changes using a dividend behavior model based on current earnings and lag dividends. Lintner's model suggests that companies should seek to maintain a consistent dividend policy and only raise dividends when management believes that earnings will continue to rise in the future. According to the ratchet effect of Lintner's model, firms progressively adjust dividends at a particular speed as an initiative to move towards the target payout ratio while avoiding dividend cuts. Meanwhile, Miller and Modigliani (1961) suggested that dividends provide insight into future cash flows in an imperfect market. Dividend changes might trigger considerable fluctuation in a firm's stock

price, and the stock returns triggered imply information about the future profitability of the company, which is consistent with the informational content of dividends.

Based on the premises laid out by Lintner (1956), Miller and Modigliani (1961) developed the information content hypothesis for dividends, which suggested that dividend changes may provide insight into a company's future earnings. Following this line of argument, Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985) demonstrated that an increase in dividend payments increased future profits while dividend reduction led to a decrease in future profits. Nevertheless, they highlighted in their models that dividend signals are sent explicitly by the management at the firm's cost. According to Bhattacharya (1979), firms that use dividends to indicate a firm's prospects may suffer from transaction costs involved with acquiring external funding, such as issuing additional shares. Meanwhile, Miller and Rock (1985) assumed that the cost of signaling is deducted from the amount of money that would otherwise have been invested, whereas John and Williams (1985) proposed that the cost of using dividends as a signaling mechanism is linked to the unfavorable tax treatment of dividends relative to capital gains.

To sum up, Miller and Modigliani (1961) suggested that firms change payout policies to transmit information about future cash flows when markets are imperfect. Indeed, Miller and Rock (1985) demonstrated that by identifying the sources and uses of funds, the net payout choice could convey information about future earnings to the market. Lintner (1956) and Miller and Modigliani (1961) initially proposed the notion of information content for dividends, which was also applicable to share repurchases, as suggested by Bhattacharya (1979). Since then, numerous studies have been conducted to investigate the relationship

between dividends and share repurchases and future earnings, but no consistent conclusions have been reached.

2.3 Information Content Hypothesis for Dividend: Significant Results

Watts (1973) was among the first to test the information content hypothesis for dividends. By focusing on the U.S. market, a sample of 310 firms was included from 1946 to 1967. As a result, the association between future earnings changes and current unexpected dividend changes was, on average, positive, thus supporting the information content hypothesis. However, only minor information content was conveyed, as shown by the extremely low average t-statistics obtained from the regression analysis between the dependent variable of next year's earnings and the explanatory variable of current year's dividends.

Woolridge (1982) examined the information content of dividends in the U.S. market from 1971 to 1977 using a different alternative from Watts (1973) by relating unexpected dividend changes to abnormal stock returns. With some improvement made from previous studies, an ex-ante dividend expectation model was tested by focusing on daily rather than monthly returns in the analysis and explicitly controlling for the influence of earnings. The results show that stock prices responded to unanticipated dividend change announcements, conclusively establishing that dividends carry information about future earnings.

Daniels, Shin and Lee (1997) argued that inconclusive results on the information content of dividends from prior studies might be due to the use of aggregate data for testing firm-specific hypotheses and the use of current earnings as a proxy for future earnings of the firm. Hence, they intended to resolve this limitation by utilizing individual firm-level data and decomposing the current earnings of firms into permanent and transitory components to

investigate the nature of the information transmitted by dividends in the U.S. market from 1975 to 1990. The Granger causality test found a robust relationship between dividends and a firm's future permanent earnings for only 50% of the sample, which did not deviate much from those using aggregate data. However, the causality study for the dividend to current earnings failed to detect a causal relationship for more than 80% of the sample. Although future earnings cannot be directly observed, dividends may serve as a credible proxy for future earnings if a significant relationship exists between dividends and permanent earnings. Thus, the dividend directly provides information about the firm's future earnings by confirming that it has permanent earnings (Daniel et al., 1997).

Nissim and Ziv (2001) reexamined the information content of dividends for U.S. firms for a sample period of 1963 to 1998. They found robust evidence of a positive relationship between dividend changes and future earnings changes. Dividend change was defined as the quarterly dividend per share change rate, while future profitability was defined as future earnings, future abnormal earnings and future earnings changes. They contended that the failure of prior research to reveal the underlying relationship between dividends and future earnings was mainly due to the issues of measurement error and omitted correlated variables in specifying a correct estimation model of unexpected earnings. To address the issue of measurement errors in the dependent variable that were correlated with dividend change, Nissim and Ziv (2001) deflated earnings change by the book value of equity rather than the market value of equity. Besides, the ROE was introduced as an extra independent variable to solve the problem of omitted control variables that were correlated with dividend changes. They argued that the ratio of earnings to book value of equity is an effective means of controlling for mean reversion. Based on the assumption of uniform mean reversion and linear autocorrelation on earnings, Nissim and Ziv (2001) discovered a positive association

between current dividend changes and future earnings changes two years following the dividend change.

Nissim and Ziv (2001) then employed the approach of Fama and Macbeth (1973) to account for the heteroskedasticity and autocorrelation in the regression residual. They included earnings change in the dividend change year as an additional control variable, apart from accounting for dividend increases and dividend decreases in the Fama and Macbeth refined cross-sectional model. Consequently, dividend increases showed a positive and significant relationship with earnings changes in the first and second years after dividend increases. In addition, the link between the change in dividends and the future level of profitability was examined using two profitability measures, namely earnings and abnormal earnings. Earnings were defined as the total rate of return on equity, while abnormal earnings were defined as the difference between earnings and the required rate of return based on the cost and amount of invested capital. In the regression analysis, expected profits were also controlled by including historical accounting data, stock market value, and past dividend changes. When profits were measured as future earnings and future abnormal earnings, dividend increases were positively correlated with profitability over the next four years. Such a relationship was stronger for abnormal earnings. However, dividend decreases were not associated with future profits for the measurement of earnings and abnormal earnings. The study was replicated in the robustness test using consensus analysts' earnings forecasts as an alternate measurement of expected earnings. Dividend increases were only found to be positively related to unexpected earnings in three of the five years' studies, while dividend decreases were found to have an insignificant relationship. To conclude, the study by Nissim and Ziv (2001) proved the information content hypothesis of dividends, which was not recognized in the U.S. market in prior studies.

The purpose of the study by Arnott and Asness (2003) was to determine if dividend policy, as measured by the payout ratio, accurately estimates future aggregate earnings growth for the U.S. equity market portfolio as proxied by the S&P 500 index. Strong evidence from the study implied that the growth rate for expected future earnings, measured as earnings per share, was fastest when current payout ratios were high and slowest when payout ratios were low. This result held true throughout many subperiods, even when including adjustments for mean reversion of earnings growth and various micro and macro variables. In short, the aggregate study by Arnott and Asness (2003) supported the information content hypothesis.

The purpose of the study by Zhou and Ruland (2006) was to examine the association between dividend payout and future earnings growth among U.S. firms with company-level data from 1950 to 2003. A statistically significant and positive association was discovered between the current dividend payout and future earnings growth, whereby a high dividend payout ratio indicates strong future earnings growth. The positive correlation between dividend payout and future earnings growth was particularly pronounced for firms with limited growth opportunities, which corresponds to the free cash flow hypothesis apart from the information content hypothesis. Zhou and Ruland (2006) employed a multivariate regression model to conduct company-by-company analysis for a large sample of firms over 50 years. Earnings growth in this study was quantified as compounded yearly earnings growth for common stockholders over short (1 year ahead), intermediate (3 years ahead) and long (5 years ahead) horizons. Profitability, size, leverage, and earnings yield were also added as control variables. As a result, company size, profitability as measured by return on assets and earnings yield were negatively related to future earnings growth. Meanwhile, a significant positive relationship was revealed between leverage and future earnings growth.

The analysis conducted with different earnings metrics and sub-periods, additional controls for mean reversion in earnings, accountability for industry influence and share repurchases added robustness to the findings. As a result, dividends may be a good predictor of future earnings growth, which is consistent with the findings of Arnott and Asness (2003), who used aggregate data rather than the company-level data used by Zhou and Ruland (2006).

Previous studies have placed a greater emphasis on firm-level data than on aggregate data when investigating the information content of dividends. However, the relationship between dividends and future earnings at the aggregate level may be more robust than at the firm level, as aggregation removes firm-specific earnings data and implies macroeconomic trends. Wann and Long (2009) thus considered this subject matter by investigating the link between aggregate dividends and aggregate earnings for U.S. firms from 1952 to 2004. Aggregate dividends were found to be significantly related to aggregate earnings. Such a relationship was stronger when the payout ratio exceeded the long-run target payout ratio and with the occurrence of a positive liquidity shock measured by changes in aggregate cash balances. Aggregate future earnings growth was indicated by aggregate payout ratios for horizons of up to three years. In short, this research established a positive and statistically significant association between dividend changes and future earnings with aggregate data. The results supported the ratchet effect proposed by Linter (1956), which indicated that corporations are hesitant to reduce dividends and will only raise them if accompanied by an increase in expected earnings.

Choi et al. (2011) evaluated the association between dividend changes and future earnings changes of Korean firms from 1991 to 2007 by applying the methodology of Nissim and Ziv (2001). Earnings before extraordinary items were used to calculate future earnings

changes, which serve as the dependent variable. Results from both simple regression and Fama and Macbeth cross-sectional regression indicated a statistically significant and positive association between dividend changes and earnings changes in the succeeding year, which was consistent with the findings of Nissim and Ziv (2001) and thus supported the information content hypothesis for dividends.

In the context of the Malaysian market, Lee et al. (2012) examined the relationship between dividend changes and future earnings changes from 1998 to 2007. Dividend changes as represented by dividends per share portrayed a significant and positive relationship with current earnings changes as measured by earnings per share. However, only a weak relationship with small magnitude was shown for earnings changes after one year of dividend changes, while no relationship was found for future earnings changes in the second and third years after dividend changes. Besides, Lee et al. (2012) also showed that the size of dividend changes was unrelated to future earnings changes. However, they discovered that dividend increases during the recovery years of the Asian Financial Crisis in 1997 were associated with future earnings increases. Dividend changes must be significant by 50 percent or more to convey a specific signal about future earnings. However, the scope of this signal was only confined to the first year following the dividend changes. Additionally, the results indicated that dividend stability might strongly influence the availability of information about future earnings. Hence, it was suggested that firms with a consistent dividend policy are more likely to consider the future profitability of firms when making dividend change decisions. In general, Lee et al. (2012) found evidence for the information content of dividends in Malaysia, but only for the first year following dividend payment.

Chen and Kao (2014) studied the information content of dividend changes on firms' future profitability in the Taiwan market from 1994 to 2011. They employed a different approach with the generalized method of moments to resolve the endogeneity and heterogeneity problems inherent in dynamic panel data models. Dividend change was measured as the annual change in dividend per share. The firm's profitability was represented by abnormal earnings, which were calculated by subtracting the cost of the capital employed at the beginning of the dividend change year from earnings before extraordinary items at the end of the dividend change year. Their findings indicate that prior abnormal earnings effectively predict future abnormal earnings. Besides, dividend increases were also significantly related to future profitability and lasted up to four years after the dividend increases. Overall, the information about the future profitability of firms was derived from previous abnormal earnings instead of changes in dividends, thus diminishing the signaling power of dividend changes.

Farrukh, Irshad, Khakwani, Ishaque & Ansari (2017) conducted research in Pakistan to determine how a dividend policy influences the wealth of shareholders and the performance of firms. They employed a regression analysis encompassing a sample from 2006 to 2015. Dividend policy was divided into dividends per share and dividend yield as an independent variable. Earnings per share and share price measured the dependent variables for shareholders' wealth, while return on equity served as a barometer of a firm's performance. The regression results revealed a positive association between the change in dividend per share and the change in share prices of Pakistani firms. Meanwhile, dividends per share and dividend yield were also positively and significantly related to the change in earnings per share and the change in return on equity. Farrukh et al. (2017) found that dividend policies significantly influence firm value, which is consistent with the information

content hypothesis whereby firms use dividend payments to signal firms' future performance.

Al-Shattarat, Al-Shattarat and Hamed (2018) examined the signaling theory of dividends in Jordan from 2009 to 2015 by utilizing two methods. The first approach was to gauge the market's response to dividend announcements. Results from the event study methodology showed a statistically significant and positive abnormal return on the day the dividend was announced, thus implying a favorable market reaction to dividend announcements. Secondly, they examined the predictive power of dividend announcements towards the firm's future earnings to study the information content of the dividend. Since dividend payout could be affected by managers' expectations of future profitability, the firms' future profitability could be influenced by dividend changes through an adjustment in their capital structure.

Al-Shattarat et al. (2018) used a simultaneous equation model with a two-stage least square approach to address the endogeneity problem between dividend changes and future earnings changes. Using both linear and nonlinear models from Nissim and Ziv (2001) and Grullon et al. (2005), their findings indicated a significant relationship between dividend announcements and firm profitability in the preceding year and the next year, but not in the second year after the announcements. Therefore, the results supported the information content of dividends, but dividend announcements could only forecast the firm's future earnings in the short run. Apart from that, similar results were obtained with the return on assets as an alternative measure of firms' earnings in the robustness test. Dividend changes were shown to be significantly and positively related to return on assets in the first year, but were found to be insignificant in the second year. In short, the signaling effect of dividends

was validated through both econometric approaches in the study by Al-Shattarat et al. (2018), which thus proved the existence of information asymmetry in the Jordanian market.

The study by Ham, Kaplan and Leary (2020) showed that dividend changes contain information about highly persistent changes in future economic income among U.S. firms from 1971 to 2016. They employed an “event window” approach to compare earnings announced after the dividend change to earnings in the comparable period before the dividend change. As a result, strong evidence proves that dividend changes do predict future earnings changes. These findings are robust to several proxies for expected earnings, like ROA, operating cash flow, earnings before extraordinary items and gross profit, and include linear and nonlinear functions of past earnings levels, earnings changes and stock returns, as well as a matched sample of non-changers and analyst earnings forecasts. Further, these differences in future earnings are highly persistent, in which dividend changes help explain the level of unexpected earnings up to at least three years after the dividend change. Hence, the findings by Ham et al. (2020) support the view that dividends convey information about future earnings after delineating the timing of earnings relative to dividend announcements with an event window approach.

Chang, Ishida and Kochiyama (2021) focused on the effect of management forecasting ability on the predictive power of dividend changes on future earnings among Japanese firms from 2002 to 2018. They posited that the predictive ability of dividends could vary with the forecasting ability of managers. They used the average annual management earnings forecast accuracy for the past three years to indicate the managerial forecasting ability. As a result, they found that dividend increases are positively related to future earnings, and such a positive association is more prominent among firms with high-

forecasting ability managers. Their findings supported the dividend signaling theory and demonstrated the role of management forecasting ability in moderating the relationship between dividend changes and a firm's future earnings.

In summary, Nissim and Ziv (2001) proved the positive relationship between dividend changes and future earnings changes up to 3 years after accounting for the issue of measurement error and omitted correlated variables in the estimation model of unexpected earnings. Similarly, Choi et al. (2011), who later employed the modified model of Nissim and Ziv (2001), also found a significant positive association between dividend changes and firm profitability in the context of the Korean market, which simultaneously inferred that the earlier findings by Nissim and Ziv (2001) are universally valid. Using company-level data, Zhou and Ruland (2006) discovered that high dividend payout is related to high future earnings growth. Meanwhile, Wann and Long (2009) found that changes in aggregate dividend payout ratio have information content about aggregate future earnings growth for horizons up to three years when using aggregate data rather than firm-level data. However, Al-Shattarat et al. (2018) presented evidence on the predictability of dividends on the firms' ROA limited to the first year subsequent to the dividend announcement. Furthermore, Lee et al. (2012) discovered that dividend changes are only related to earnings changes measured in terms of earnings per share one year in advance, and are largely unrelated to earnings changes beyond one year. Thus, both of these studies only support the information content hypothesis in the short run.

2.4 Information Content Hypothesis for Dividend: Insignificant Results

The study by Benartzi et al. (1997) among U.S. firms did not support the information content hypothesis of dividends. As shown by the results of the categorical analysis, there

was no correlation between current dividends and future earnings changes. Empirical results covering the sample period from 1979 to 1991 showed that dividend increases were only related to past and current earnings, while earnings increases were only detected after dividend decreases. The author matched dividend-paying firms against non-paying firms based on their market size, industry and prior earnings performance through a matched sample approach to control the earnings pattern and mean reversion explicitly. The mean and median of changes in earnings for sample companies in the year before an event, during the event year and two post-event years after dividend changes were observed. However, there was no evidence of positive abnormal earnings changes after dividend increases. Earnings changes were regressed on dividend changes using OLS regression. The regression analysis revealed that dividend increases were related to earnings increases in the current and preceding years, but there were no significant earnings changes in years 1 and 2. On the other hand, the dividend cut resulted in lower earnings in the current and preceding years, but a significant increase in earnings in year 1. Thus, it could be concluded that dividends signal information about the past rather than the future, thus rejecting the information content hypothesis.

Grullon, Michaely and Swaminathan (2002) investigated the information content of dividend changes for U.S. firms from 1967 to 1993 by relating dividend policy to the life cycle of the company. In other words, they intend to examine if changes in dividends indicate changes in systematic risk. They proposed that the stock returns during the dividend change announcement period are related to changes in the systematic risk of a firm. Grullon et al. (2002) found that a substantial decline in the firm's systematic risk was seen after a dividend increase, whereas a significant rise in the firm's systematic risk was observed following a dividend decrease. Over time, it was found that firms with increasing dividends were

associated with features such as reduced investment opportunities, decreased systematic risk and lower profits. According to the maturity hypothesis, a firm's growth and investment opportunities tend to diminish as a firm becomes mature. Thus, the reduction in capital expenditures allows more free cash flows to be available for the distribution of dividends. Meanwhile, earnings measured as return on assets improved in the same year for companies that raised dividends but did not increase after that, while earnings declined for companies that reduced dividends during the same year but grew subsequently. Specifically, a lower return on assets was observed in the three years following a dividend increase, whereas a higher return on assets was noticed in the three years following a dividend decrease. In sum, Grullon et al. (2002) failed to prove that dividend changes may be used to predict future earnings changes, as no abnormal earnings increases were found after dividend changes. Rather than that, dividends gave insight into changes in a firm's systematic risk and dividend increases, particularly implied firm maturity.

One of the primary difficulties encountered in any research analysing the relationship between dividend changes and future earnings, according to Grullon, et al. (2005), is selecting the most effective approach in evaluating expected earnings. Grullon et al. (2005) claimed that the assumption of linear mean reversion in earnings by Nissim and Ziv (2001) was incorrect as the nonlinearity of mean reversion and autocorrelation in earnings had been demonstrated in the study by Fama and French (2000). Grullon et al. (2005) resolved this issue by developing an unexpected earnings model that accounts for the nonlinearity in earnings behavior by using Fama and French's (2000) modified partial adjustment model. They employed a large sample of 2,778 U.S. firms from 1963 to 1997, subdivided into 14,235 dividend increases, 947 dividend decreases, and 23,334 no-change events, to investigate the relationship between dividend changes and future profitability. Dividend

changes were defined as the annualized rate of change in quarterly dividends. However, after correcting for nonlinear patterns in earnings behaviour, the results revealed that dividend changes did not convey any information about future earnings changes. Instead, dividends were negatively associated with future profitability changes, represented by the return on assets in this case. Grullon et al. (2005) also examined whether adding dividend changes improved estimations of out-of-sample profits. The findings suggested that models that incorporate dividend changes do not seem to perform better than those that do not. Overall, the results showed that the relationship between dividend changes and future profitability was insignificant, even when various estimation techniques and multiple profitability proxies were used. The implications of dividend increases were undeniable, but they were neither about abnormal future earnings growth nor abnormal future profitability growth. It could thus be concluded that dividend changes do not predict future earnings changes, contradicting the information content hypothesis.

Wolff and Auret (2009) intended to examine the information content of dividend changes on future earnings of South African firms from 2000 to 2007. Two analysis methods were used, but both show an insignificant relationship between current dividends and future earnings. Categorical analysis based on dividends, earnings and market value revealed that the magnitude of the dividend increase has a substantial positive link with current earnings but has no predictive power for future earnings. Regression analysis was utilized to regress the dividend change in year 0 on earnings changes in years 0, 1 and 2. Earnings per share served as the dependent variable for earnings changes, while dividend per share served as the independent variable for dividend changes. Earnings change was deflated by market value, then by book value, and a covariate return on equity was included in the tests. The results only revealed a significant relationship between current dividends and earnings

changes in year 0. However, no relevant changes were observed in future earnings in the first and second years after dividend changes. Therefore, it could be concluded that only a concurrent relationship was found between dividend changes and earnings changes, whereby current dividend increases were followed by increases in current earnings. Dividends are not used by South African firms to forecast future earnings.

Choi et al. (2011) employed another methodology from Grullon et al. (2005) to examine the relationship between dividend changes and future earnings changes in Korea. However, the predictive power of dividend changes on future earnings did not exist when the nonlinear cross-sectional regression model from Grullon et al. (2005) was employed. Choi et al. (2011) divided the sample based on the characteristics of shareholder rights and level of growth to further test the information content of dividend changes on future earnings changes. Findings showed that firms with stronger minority shareholder rights and low growth firms seem to offer some insight into future earnings in both linear and nonlinear models. These results held even when the return on assets was utilized as an alternative profitability measure for the firm's future performance. Choi et al. (2011) thus concluded that the validity of the information content hypothesis of dividends in Korea is dependent on the firms' level of corporate governance or growth stage.

Ali and Urcan (2012) employed the catering theory of dividends to examine the link between dividend increases and unexpected changes in future earnings. Ali and Urcan (2012) proposed that the catering effect of dividends may affect the decision of dividend payout. According to the catering theory, investors' preferences for dividends vary over time and managers respond to this preference by distributing dividends when investors' demand for payouts is strong (Baker & Wurgler, 2004). When the dividend premium is high, managers

are more likely to raise dividend payouts to meet investor demand even without expecting higher future earnings. Thus, the motive behind dividend payout between the signaling and catering theories is confusing, as managers may increase dividends to indicate future earnings changes or accommodate investor preference. The results showed that dividend increases were positively and significantly related to unexpected future earnings changes for low dividend premiums. However, it was shown that there was no correlation between dividend increases and unexpected future earnings changes when the dividend premium was high. The finding suggested that managers raise dividend payouts to meet investor demand when the dividend premium is high rather than to signal future earnings expectations. In other words, the dividend premium has reduced the signaling effect of dividends. This study, which covered the sample period from 1963 to 2000, highlighted the significant interaction between signaling theory and catering theory in explaining the influence of dividend changes on future earnings changes. Ali and Urcan (2012) demonstrated that the dividend premium is the primary factor that affects dividend payout. They proved that U.S. managers boost dividends to fulfil investor demand rather than signal future earnings growth.

The study by Chowdhury, Maung and Zhang (2014) focused on the Chinese market from 1993 to 2006. They tested the signaling hypothesis by analyzing the effects of cash dividend payments on the future profitability of firms. They divided the sample between firms that used non-linear earnings management and those that did not. The results showed that earnings increased in two subsequent years after dividend increases. However, it was shown that neither dividend increases nor dividend cuts provide relevant information about future changes in earnings when the assumption of non-linearity of earnings holds. Besides, they also discovered that firms that have a good cash position, profitability and management efficiency are more prone to paying dividends. A well-managed company will pay out

dividends regularly and such a company usually has good corporate governance. In such cases, dividends convey information about Chinese firms' good governance and management performance. Thus, it could be concluded that dividend payments do not indicate a firm's future profitability but rather demonstrate sound corporate governance standards practiced among public listed firms in China.

Rajverma, Misra, Mohapatra & Chandra (2019) examined the impact of dividend payouts from 2007 to 2017 on corporate performance in India, which is dominated by family-controlled firms. The study employs multiple panel regressions for estimation using three measures of profitability as represented by ROA, ROE and EPS. The results reveal that dividends negatively influence all profitability measures. Furthermore, they observed increase in annual dividend negatively influences annual increase in the firm's cash flow. It suggests that higher dividends reduce the firm's free cash flow, leading to reduced profitability. Therefore, the study by Rajverma et al. (2019) failed to support the signaling theory which suggests dividend payout as a signaling mechanism for better firm profitability.

Pham et al. (2021) investigated the effects of dividend policies on Vietnamese firms' financial performance from 2008 to 2019. The research model is built using ROA, ROE and Tobin's Q as dependent variables, and the dividend rate and decision of dividend payment as independent variables. Meanwhile, firm size, leverage and growth of firms serve as the control variables for the model. The result of the panel data analysis showed that the decision to pay dividends has a negative impact on firms' financial performance, whereas the dividend rate has a positive impact on firms' performance. A negative relationship between the dividend decision and the accounting-based performance of Vietnamese firms improves market expectations for firms, but a positive association between the dividend payment and

the accounting-based performance induces a negative effect on market expectations. In addition, Pham et al. (2021) discovered a relatively low dividend rate among the 450 sample firms listed on the Vietnamese stock market. This low dividend rate implies that Vietnamese firms are keeping profits for operations and future investment. As a result, some shareholders believe in the future prospects so much that they continue investing their money in the firms. However, the low dividend, on the other hand, leads to a decrease in market expectations for the firm's future development.

By focusing on an emerging economy that had undertaken several financial sector reforms and clean-ups over the period of 2015 to 2019, Bossman et al. (2022) examined the relationship between dividend policy and financial performance among firms listed on the Ghana Stock Exchange. A panel dataset is constructed with various proxies of dividend policy, which comprise the dividend payout, dividend capacity and free cash flow savings, as the independent variables, while the dependent variables of firm performance are represented by the proxies of ROA, ROE, Tobin's Q and stock price. After controlling for firm age, size, capital structure, governance and financial sector clean-up, the regression results with the system dynamic general method of moments estimation technique found a significant effect of dividend capacity on ROA and ROE. Meanwhile, dividend payout was seen to be inversely and significantly related to ROA and ROE. There was no significant relationship between dividend policy and financial firm performance in terms of ROA and ROE, but dividend capacity and dividend payout have been shown to be significant determinants of ROA and ROE for non-financial institutions. As a result, the findings by Bossman et al. (2022) revealed a detrimental effect of financial sector clean-ups on the performance of non-financial firms only.

One of the foremost studies on the information content of dividends was conducted by Benartzi et al. (1997) using both categorical analysis and regression analysis. Benartzi et al. (1997) did not find any evidence to support the view that changes in dividends have information content about future earnings changes, while there is a strong past and concurrent link between earnings and dividend changes. Similarly, Wolff and Auret (2009) failed to predict future earnings with dividends using the same method as Benartzi et al. (1997) but instead found a concurrent relationship between current dividend and earnings changes. Grullon et al. (2005) criticized the assumptions by Nissim and Ziv (2001) and controlled the nonlinear patterns in the behavior of earnings with a modified partial adjustment model. As a result, Grullon et al. (2005) found that changes in dividends are not useful in predicting future changes in earnings. Indeed, a negative correlation was discovered between dividend changes and future changes in ROA. The modified model developed by Grullon et al. (2005) was validated by Choi et al. (2011) and Chowdhury et al. (2014), who also found insignificant evidence to support the information content hypothesis when earnings were assumed to be non-linear.

2.5 Information Signaling Hypothesis for Share Repurchase: Significant Results

Vermaelen (1981) examined the price behavior of securities issued by companies that repurchase their own shares in the open market and via tender offers in the United States. The sample included only repurchases announced in the Wall Street Journal from 1962 to 1978. Eventually, 131 tender offer announcements made by 111 firms and 243 open market repurchase announcements made by 198 firms were selected. Vermaelen (1981) examined the abnormal returns for open market and tender offer repurchases around the announcement date. The findings indicated that buyback announcements were often followed by permanent increases in stock prices, in accordance with the semi-strong form of market efficiency. The

signaling theory appeared to be the most prevailing explanation for the abnormal returns detected around the announcement date. Vermaelen (1981) confined his study of the information content hypothesis to tender offer repurchases. Tender offer repurchases were followed by positive, unexpected annual earnings, evidenced by anomalous increases in earnings per share. The tendering companies' earnings per share exceeded the estimations of two forecasting models, which was taken as proof that the information content of a share buyback program was significantly related to the level of future earnings.

Dann, Masulis and Mayers (1991) investigated whether tender offer repurchase announcements signified information about current and future earnings as well as market risk among repurchasing firms in the United States during the period from 1969 to 1978. The study used two earnings measures: annual earnings before interest and taxes and annual earnings per share before extraordinary items and discounted operations. Positive abnormal earnings were obtained in the years following tender offer repurchases using both earnings metrics. They discovered a positive association between stock price reactions to tender offer repurchase announcements and earnings surprises throughout the preceding and succeeding two years, but a negative relationship with changes in market risk. Earnings improvements were observed around the announcements of tender offer repurchases, particularly in the year of the announcement. In general, the results demonstrated positive earnings surprises and systematic risk reduction in the stock market after tender offer repurchases.

Lie (2005) used quarterly data to examine how operating performance changed after open market repurchase announcements in the U.S. from 1981 to 2000. Compared to the use of annual data by Grullon and Michaely (2004), quarterly data was instead used to detect differences in performance in prior and post-announcements. As a result, Lie (2005)

discovered that the stock price responded positively to quarterly earnings releases in the two years after the launch of an open market repurchase program. Firms that announced repurchases outperformed their industry counterparts in terms of operating performance, but their relative performance declined after the announcement of the repurchase program. Meanwhile, firms that announced share repurchases outperformed their control counterparts in the next quarter, compared to their pre-event performance. Following the repurchase announcements, the sample companies' relative performance improved within two quarters, and this improvement appeared to continue for at least another two years. In other words, both the sample firms and the control firms suffered future performance reductions because of mean reversion, although the reduction was less apparent for the sample firms over the two quarters following the announcements. Thus, the study by Lie (2005) provided evidence that announcements of open market repurchase programs increased future operating performance.

Operating performance, measured as operating income scaled by the average cash-adjusted assets at the beginning and end of the fiscal quarter, was used to represent unadjusted operating performance. Cash-adjusted assets were defined as the book value of assets, less cash and short-term investments. On the other hand, adjusted operating performance was measured as unadjusted performance less the performance of control firms. Lie (2005) classified the samples into two sets of control firms. The first set was composed of companies in the same sector with comparable sizes, while the second set was comprised of companies within the same sector that had identical pre-event performance metrics and market-to-book ratios. Then, industry-adjusted operating performance and performance-adjusted operating performance were computed accordingly to compare with the unadjusted operating performance.

Lie (2005) further examined two subsamples according to the initiation of repurchase. The first subsample included companies that declared an open market repurchase but did not execute the transaction within the same fiscal quarter. The second subsample consists of firms that repurchased shares worth more than 1% of their total asset value in the quarter preceding the announcement. The results indicated that the operating performance was not improved for companies that did not repurchase shares during the quarter in which the announcement was made. In contrast, companies that repurchased shares during the announcement quarter showed a significant performance improvement. In sum, there was compelling evidence that companies that combined announcements of open market repurchases with the implementation of actual share repurchases enhanced their operating performance in the subsequent period.

Based on the intuition that managers who expect larger future payoffs to their firms' stocks should announce larger buybacks, Giambona, Golec and Giaccotto (2006) tested whether real estate investment trust (REIT) managers in U.S. announce share repurchases to signal private information about their firms' prospects over the period between 1997 and 1999. As a result, Giambona et al. (2006) showed that the size of a REIT repurchase program is positively related to the future (six to twelve months) funds from operation of the REIT, thus indicating that share repurchases contain information about a REIT firm's operating performance.

Wu (2012) evaluated the effect of agency problems on the information content of open market repurchase announcements, buyback behaviour and the subsequent operating performance of repurchasing firms in Taiwan from 2000 to 2009. The degree to which firms encountered agency problems was assessed by the ownership of management. Management

ownership was defined as the situation in which shareholders own the firms or shareholders serve as the company's managers. The separation of ownership and control caused the agency problem, and agency costs were particularly affected by information asymmetry as managers' and principals' interests diverged more. Since repurchases can be employed for various reasons, the true motivation behind buyback announcements is sometimes harder to identify, especially when information asymmetry is noticeable. It is believed that firms with a greater percentage of management ownership reduced the information asymmetry between managers and outsiders, which resulted in a less severe agency problem. The agency theory claims that fewer severe agency problems generate better information. Return on assets was used as a proxy for operating performance. Repurchasing firms with a less severe agency problem are more likely to confirm the earlier undervaluation signal due to the significant positive association between operating performance and management ownership. In other words, the improvement in operating performance among repurchasing firms improved due to a reduction in the severity of the agency problem. The findings from the multivariate analysis suggested that corporations with a less serious agency problem are more likely to reveal more information in their repurchase announcements, repurchase fewer shares and perform better in the subsequent period after the repurchase programs are initiated.

Al-Sharawi (2022) examined the impact of the share buyback process on the financial performance of 66 firms listed on the Egyptian Stock Exchange from 2009 to 2020. At the same time, the interactive impact of share repurchase motives on the relationship between share buybacks and firm financial performance is also examined. By employing the OLS regression analysis, the dependent variable consists of three indicators for financial performance as measured by economic value added, return on assets and return on equity. The explanatory variables consist of share buybacks, excess cash flow, earnings per share

and financial leverage, while the control variables include firm size and growth. The results show a positive effect of share buybacks on financial performance, measured by the economic value added and the return on equity. However, the results show an insignificant effect of share buybacks on the return on assets. The study found that management's motive to achieve a cash surplus improves the company's financial performance. Moreover, the study found that increasing earnings per share is the most crucial motive for share buybacks in the Egyptian market. Overall, the study by Al-Sharawi (2022) found an effect of share buybacks on financial performance.

In general, a positive effect is found between share buybacks and financial performance under various situations. Lie (2005) showed that the operating performance of firms improve following the announcements of open market repurchase programs. Further investigation revealed that the improvement in operating performance is limited to firms that really repurchase shares during the same fiscal quarter (Lie, 2005). Meanwhile, Wu (2012) suggested that firms with a less severe agency problem have greater information content in their repurchase announcements. Furthermore, Al-Sharawi (2022) discovered that share repurchase had the greatest impact on improving firms' economic value added when compared to return on assets or return on equity.

2.6 Information Signaling Hypothesis for Share Repurchase: Insignificant Results

Bartov (1991) examined the information content hypothesis in the context of open market stock repurchases instead of Vermaelen (1981), who focused on tender offer repurchases. He intended to explore the nature of information conveyed by open market repurchases among U.S. firms from 1978 to 1986. Bartov (1991) reported that earnings improved during the announcement year when analysts revised their earnings forecasts

upward surrounding open market repurchase announcements in comparison to control firms. Meanwhile, the cross-sectional analysis revealed a positive correlation between repurchase announcement stock returns and concurrent year earnings changes, while a negative correlation was shown between repurchase announcement stock returns and risk changes. In general, the evidence suggested that open market repurchase announcements provide insight into earnings and risk, but no evidence of earnings improvements was found in the years after the announcement.

Oyon, Markides and Ittner (1994) investigated the information content of tender offer repurchases on future earnings of U.S. firms from 1971 to 1985. They compared real post-offer earnings to pre-offer earnings to see if tender offer repurchases provide insight into future earnings levels. They found that although tender offer repurchases do not result in earnings growth in the years following the buyback, they do result in earnings growth during the year of the tender offer. The earnings forecast revisions were positive in the second and third quarters after the buyback. These findings generally supported the notion that share repurchases transmit significant positive information regarding the future cash flow levels of the repurchasing firms.

Evans and Evans (2001) tested whether share repurchase programs in the U.S. are a performance improvement strategy. They compared the level of accounting performance between share repurchasing firms and non-repurchasing firms for a sample of companies employing tender offer repurchases and open market repurchases from 1976 to 1995. The proxy variables used for measuring accounting performance in this study included sustainable growth rate, earnings per share, return on sales, return on assets and return on equity, while the book to market value represented market performance. Comparative

analysis was employed to track the accounting performance of the samples throughout the announcement period, including three years prior to and three years post-buyback. The aggregate sample indicated that the performance of the repurchasing firms did not increase substantially in the post-announcement period. Indeed, accounting and market performance metrics were shown to be typically higher among non-repurchasing firms. Therefore, the result refuted the theory that management's share buyback program indicates an improvement in a firm's long-term performance.

The study by Jagannathan and Stephens (2003) was founded on the frequency of open market repurchases. They postulated that there are differences between companies that initiate buyback programs on a regular basis and those that conduct occasional, isolated repurchases. Therefore, the purpose of their study was to examine variations in motivations, firm characteristics and market performance of repurchasing firms in the U.S. apart from comparing the operating performance of firms that buy back shares regularly to those that repurchase them occasionally or infrequently in the succeeding years. Even though the sample only included open market repurchase programs announced between 1986 and 1996, Jagannathan and Stephens (2003) classified the repurchase announcements into three categories based on the number of repurchase programs initiated by the firm during the previous five-year period, which began in 1980. Infrequent and occasional repurchases were defined as the first and second open market repurchase programs initiated in five years, respectively. A frequent repurchase was defined as the third or subsequent share buyback program initiated in a five-year period. By comparing operating income prior to and after open market repurchase announcements, univariate analysis was used to examine differences in operating performance among repurchasing firms. Accordingly, they found no evidence of improved operating performance following open market repurchases. Following the

buyback announcements, the infrequent repurchasers' operating performance deteriorated considerably in comparison to their peers, as indicated by a control sample of companies that had not announced a repurchase program in the preceding two years. While the occasional and frequent repurchase groups outperformed their counterparts in terms of operating performance, their raw operating performance fell.

Grullon and Michaely (2004) examined the notion that management uses share repurchase to signal better prospects for firms. The sample included open market repurchases in the U.S. from 1980 to 1984, and they used various measures to compute the unexpected changes in firm performance with annual data. They employed the variable of operating income before depreciation, scaled by the average beginning and ending period book value of assets, as a primary indicator for evaluating operating performance. They then tested the post-repurchase performance for up to three years, while EPS forecasts were used to measure future earnings. Moreover, the robustness test was carried out with the dependent variables of return on cash-adjusted assets, return on sales and cash flow return on assets as proxies for the firm's profitability. If repurchase programs convey positive signals about firms' prospects, then operating performance, profitability and the market's expectations about future earnings should improve in the years following repurchase announcements.

Grullon and Michaely (2004) examined the association between share repurchase and future operating performance and profitability changes. They discovered that announcements of open market share repurchase programs do not improve operating performance. Furthermore, they discovered no evidence that repurchasing companies outperform their peers in terms of future profitability. The data suggested that profitability declined in the years following the buyback. Next, they examined how analyst earnings per

share projections changed because of the repurchase announcement. As a result, they found that analysts revised their earnings forecasts upward around the announcements of the open market repurchase program, with only little evidence that earnings improved during the year of the announcement. In short, the study by Grullon and Michaely (2004) did not provide support for any robust improvement in firm performance after share repurchase. Only limited evidence of improved performance was discovered surrounding the announcements of an open market repurchase. Even if there was a performance improvement, it occurred during the year the announcement was made rather than in the following years.

Croce, Daminelli and Giudici (2008) analyzed the operating performance of industrial companies listed on the Italian Stock Exchange that announced a share buyback from 1989 to 2001. They considered three different samples: 160 companies that announced a stock repurchase for the first time; 99 firms that really carry out a buyback after the announcement; 61 companies that, on the contrary, did not effectively engage in a buyback. The operating performance is measured as the EBITDA/cash-adjusted assets ratio. As a result, they found a significant worsening of the operating performance subsequent to the announcement, both in absolute terms and compared to a control sample of matching companies. The poor operating performance was particularly significant for companies that effectively buy back the shares after the announcement, while no significant difference is detected for firms that announce the buyback but do not repurchase shares effectively. The findings by Croce et al. (2008) suggest that stock repurchases are considered a commitment that the company is ready to pay back cash to shareholders, given that profitability will decrease.

Huang, Liano and Pan (2009) examined whether the announcement of open market stock repurchase programs for REITs among U.S. firms from 1990 to 2001 contained information about future operating performance. They observed operating performance within the four-year period subsequent to the announcement of a share repurchase to see if it provided insight into the future profitability of a real estate investment trust's firm. Huang et al. (2009) regressed the cumulative abnormal return on change in operating performance, represented by a change in funds from operations on equity. The findings indicated a positive correlation between the abnormal return of a five-day repurchase announcement and changes in future profitability. The sample's operating performance improved in the four years prior to the buyback announcement, reached a high in the year of the announcement, and then dropped in the four years following the buyback. Although operating performance had declined since the buyback announcement, it appeared to be higher than it was prior to the announcement. Furthermore, the regression analysis revealed that the positive announcement effect might be explained by improvements in future operating performance. These findings suggest that the market reacted favorably to the announcements of repurchases because investors believed firms had incorporated information regarding enhanced future operating performance into share buybacks. However, they discovered no positive evidence that stock buybacks for real estate investment funds in the United States are related to operating performance.

Huang et al. (2010) examined whether operating performance for real estate investment funds improved following open market repurchase announcements in the U.S. from 1991 to 2001. The information signaling hypothesis was evaluated on the basis that if share repurchases send positive signals to investors, then operating performance should improve in the subsequent years of repurchase announcements. Three measures of operating

performance were used, which included the funds from an operation on equity, return on equity and return on assets. Test statistics for the mean and median showed that the operating performance of repurchasing REITs peaked either during the year of the buyback announcement or in the year after the announcement. However, there was no evidence that the REITs' operating performance improved four years after the repurchase announcement. Additionally, repurchasing REITs does not appear to improve in their future operating performance when compared to their counterparts.

Later, Huang et al. (2010) examined the relationship between future changes in operating performance and the size of the share repurchase program with regression analysis. The size of the REIT repurchase program was used to indicate private information to the management. However, they found no evidence linking the magnitude of a repurchase program to future operating performance. Instead, the findings revealed that the size of the repurchase program was primarily and inversely related to changes in operating performance over a four-year period following the buyback. Contrary to the information signaling theory's predictions, there was no evidence that operating performance had improved following the announcement of REIT share repurchases. Consequently, the open-market stock repurchase announcements by REITs are not indicative of their long-term prospects..

Bhullar, Bhatnagar and Gupta (2018) examined the impact of share buybacks on the firm value of Indian firms from 2006 to 2016. They measured firm value with the proxy of enterprise value to replace the stock price. The results of the univariate analysis with a paired sample t-test showed that the firm value decreased, followed by the issuance of share buybacks. Meanwhile, they found that the proportion of capital employed for share buyback did not reflect any significant effect on firm value.

Wang, Nguyen and Dinh (2020) investigated Vietnamese firms' long-term abnormal returns and operating performance after the share repurchase announcements from 2008 to 2016. They conducted their study based on matched control samples by industry, exchange listing, size plus book-to-market and pre-event performance using univariate and multivariate analyses. As a result, higher post-repurchase buy-and-hold abnormal returns were significantly observed only for the one-year window. However, improvement in operating performance for repurchasing firms was only shown in the concurrent fiscal year, with no significant differences found for the subsequent fiscal year. Meanwhile, the higher completion rate of share repurchase was found to exhibit a more substantial effect on the positive association between post-repurchase abnormal returns and subsequent operating performance, which proved the intensity of actual repurchase in conveying a credible signal to the market.

Kim and Park (2021) analyzed whether long-term performance differs when firms use different repurchase methods, and whether the transparency of past accounting disclosures affects long-term performance following a repurchase. The long-term performance is measured using 12-month and 24-month buy-and-hold abnormal returns, and 1-year and 2-year excess return on assets, following a repurchase disclosure among the sample of 398 Korean firms from 2004 to 2012. The univariate analysis shows that firms that acquire shares directly in the open market show both positive excess stock returns and positive excess operating performance, whereas those that acquire shares indirectly show insignificant long-term performance. Moreover, the univariate analysis indicates that overall share repurchasing firms with a history of low earnings timeliness have poor long-term performance. The evidence provided by Kim and Park (2021) suggests that firms choosing

the indirect repurchase method have a negative effect on the firm's long-term performance following a repurchase, especially for firms with a history of poor earnings timeliness.

In conclusion, Evans and Evans (2001) proposed that accounting performance as measured by ROA, ROE, and EPS does not significantly improve in the post-announcement period among repurchasing firms. Meanwhile, Jagannathan and Stephens (2003) did not find any evidence of improved operating performance following repurchases. Although the operating performance of the occasional and frequent repurchase groups improved slightly relative to their peers, their raw operating performance actually declined. Furthermore, Grullon et al. (2004) discovered that the future profitability of repurchasing firms, as indicated by ROA, did not improve but rather declined in the years following the repurchase. Croce et al. (2008) even found a significant worsening of the operating performance subsequent to the announcements of share repurchases.

2.7 Chapter Summary

In summary, mixed results have been obtained from studies on the information content of dividends, which mostly revolve around the developed market. In the U.S., supportive evidence consistent with the information content hypothesis of dividends was shown by Watts (1973), Woolridge (1982), Nissim and Ziv (2001), Arnott and Asness (2003) and Zhou and Ruland (2006), whereas Benartzi et al. (1997), Grullon et al. (2002) and Grullon et al. (2005) did not find support for the information content hypothesis of dividends. There are a few noteworthy studies to be highlighted. The first study was conducted by Nissim and Ziv (2001). They discovered a surprising positive relationship between dividend changes and future earnings changes for up to two years after accounting for measurement error and omitted correlated variables. However, Grullon et al. (2005)

questioned the validity of Nissim and Ziv's (2001) assumptions of uniform mean reversion and linear autocorrelation. Subsequently, Grullon et al. (2005) found no predictive power of dividend changes on the firm's future earnings after controlling for non-linearity in the earnings process with a modified model. Meanwhile, Lee, Lim, and Isa (2012) investigated the information content of dividends in the Malaysian context by regressing changes in earnings per share to changes in dividend per share, but only found a weak relationship between dividend changes and earnings changes after one year. Overall, prior studies on the information content of dividends have generally concentrated on examining the impact of changes in dividends on future earnings changes, with less focus on the relationship between dividend payout ratio and future financial performance.

Meanwhile, existing studies have thus far produced inconclusive results concerning the information signaling hypothesis for share repurchases. Earlier studies by Vermaelen (1981) and Bartov (1991) did not find any robust evidence indicating improvements in future earnings after share repurchase announcements. Moreover, Jagannathan & Stephens (2003) showed a decline in the operating performance of repurchasing firms after announcements of open market repurchases. Meanwhile, Grullon & Michaely (2004) discovered that the performance of repurchasing firms improves during the announcement year but not in the subsequent years following the open market repurchase announcements. Nevertheless, Lie (2005) provided robust evidence of improved future operating performance among open market repurchasing firms that only implement actual repurchases rather than announcements using quarterly data. In short, prior research on the information signaling hypothesis for share repurchases has primarily focused on the signaling effects of share buybacks on future operating performance, where operating performance is defined as

operating income divided by the average of the beginning and ending period book value of assets (Grullon & Michaely, 2004; Lie, 2005).

CHAPTER 3

METHODOLOGY

3.1 Chapter Overview

The first part of this chapter describes the sample data and sample period of the study. The next part illustrates the research framework, while the following section presents the empirical model of the study and definitions for all the variables. Following that, hypothesis is set up from the respective models. The subsequent section then explains the panel data analysis method used in this study. Lastly, the final section explains the various sensitivity tests to be used for robustness checking of the results.

3.2 Data Description

The sample data for the current study shall comprise public listed companies on the main market of Bursa Malaysia that are active within the sample period of 2000 to 2020 and have been involved in either dividend payout and/or share repurchase. As of 2020, there were a total of 867 companies listed on the main market of Bursa Malaysia. After excluding financial firms, we arrive at a total of 747 listed companies that pay dividends and a total of 423 listed firms that buy back shares. The sample firm for the current study only includes public listed firms that were active throughout the sample period of 2000 to 2020. Financial firms from the banking, insurance and real estate investment trust industries are not included, as firms from the financial services sector tend to display higher leverage, making them incomparable with companies from other industries. Therefore, the final sample comprises 355 dividend paying firms and 153 share repurchasing firms after filtering out financial firms. Meanwhile, the sample for mutual payers is obtained by merging the 355 dividend paying firms and the 153 share repurchasing firms to get the overlapping samples that are

mutually inclusive. As a result, it came out with sample firms of 144 mutual payers after the combination.

Following the data screening process, the final sample consists of 355 dividend paying firms, 153 share repurchasing firms and 144 mutual payers. Consequently, the sample data for the current study is composed of a set of balanced data, amounting to a total of 7100 observations for the sample of dividend payers, 3060 observations for the sample of share repurchasers and 2880 observations for the sample of mutual payers. In order to capture as much impact as possible, we include the widest range of sample periods, starting from the period of 2000, when share repurchase data was only made available online, and continuing until 2020, just prior to the outbreak of COVID-19. The actual observations shall comprise a period of 20 years, as the dependent variables are measured one year ahead. Hence, the observations for the independent variables employ the data from 2000 to 2019, while the observations for the dependent variables utilize the data from 2001 to 2020.

The secondary data for the current study is collected on an annual basis through online databases. Relevant financial data like common dividends, total assets, cash and equivalents, total liabilities, total equity, market capitalization, current assets and current liabilities are downloaded through Data Stream and Orbis Database. Meanwhile, the information for the share buyback, which includes the total number of shares purchased and the total consideration paid for shares purchased, is retrieved from the Bursa Malaysia website under the immediate announcement of share buyback.

3.3 Research Framework

The information content hypothesis, also known as the information signaling hypothesis, contends that corporate payout policies convey information about the prospect

of firm performance. Firms tend to use dividend payouts or share repurchases to signal improvements in future performance (Lintner, 1956; Miller & Modigliani, 1961). Lintner (1956) suggested that management tends to increase dividends when they believe their earnings have permanently increased. Miller and Modigliani (1961) suggested that changes in payout policies can convey information about future cash flows when markets are incomplete. Building on the premise of asymmetric information, Bhattacharya (1979), Vermaelen (1981) and Miller and Rock (1985) postulated that payout decisions are explicit signals about future earnings conveyed purposely and at some expense by the firm's managers to the shareholders. Subsequently, numerous studies have examined the predictive ability of payout policies towards future firm performance.

Benartzi et al. (1997) were one of the earliest researchers to examine whether dividend changes have informational content about the firm's future earnings with earnings scaled by the market value of equity, which corresponds to the earnings yield. Nissim and Ziv (2001) examined the relationship between dividend changes and future earnings changes with earnings scaled by the book value of equity, equivalent to the return on equity. Meanwhile, the study by Grullon et al. (2005) extended the test on the information content of dividends towards future profitability by including return on assets. On the other hand, Evans and Evans (2001) examined whether share repurchase improves a firm's accounting performance in terms of return on assets, return on equity and earnings per share through comparative analysis. Lie (2005) used univariate analysis to examine the information signaling of share repurchases relative to the firm's future operating income. In the meantime, Huang et al. (2010) regressed future changes in funds from operations, return on equity and return on assets on the size of the repurchase program to examine whether an

improvement in the firm's operating performance was found after the share repurchase announcement was made.

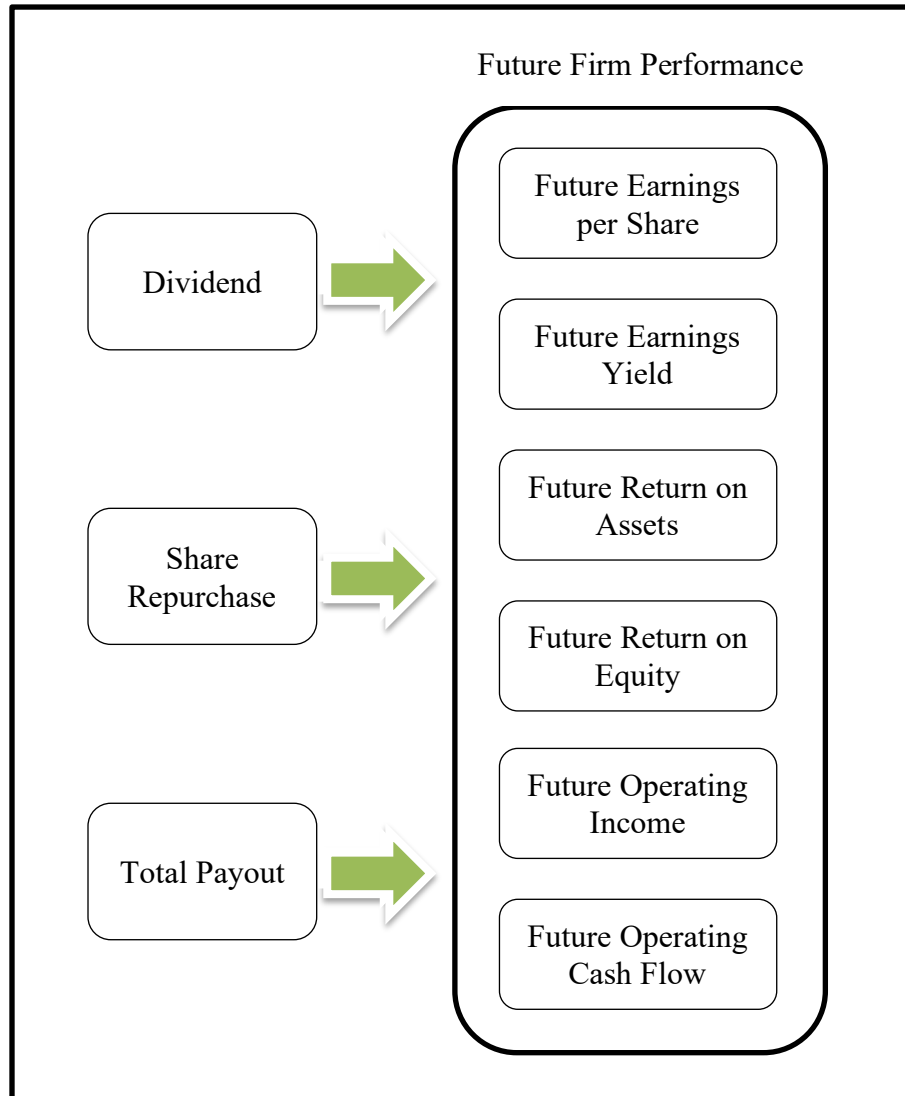


Figure 3.1: Research Framework of the Study

Following that, the research framework, as shown in Figure 3.1, is formed to test the information content of corporate payout policies in Malaysia by examining the impacts of respective payout policies on future firm performance. The corporate payout policy will be represented by either a dividend or share repurchase, and also a total payout which counts both dividend and share repurchase simultaneously. Meanwhile, future firm performance

will be indicated by six proxy variables measured from three perspectives, which include the market performance as denoted by earnings per share and earnings yield; the financial performance as defined by return on assets and return on equity; and the operating performance as indicated by operating income and operating cash flow, which are all measured in the following year of payout.

3.4 Empirical Model

For the context of the current study, a linear model is employed to test the impacts of respective corporate payout policies on future firm performance. Based on the research framework in the previous section and the adoption of the model from Huang et al. (2010), Equation 3.1, Equation 3.2 and Equation 3.3 are designed, and panel regression analysis will be run with Stata software. Equation 3.1 regresses the respective proxies of future firm performance on the dividend ratio. Equation 3.2 regresses the respective proxies of future firm performance on the share repurchase ratio. Equation 3.3 regresses the respective proxies of future firm performance on the total payout ratio.

The independent variables are denoted by the dividend ratio, share repurchase ratio and total payout ratio, respectively. Meanwhile, the dependent variables are represented by various proxies of future firm performance as indicated by earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow, all measured in the first year following payout. The empirical model for this study only tests lag 1 because, in the context of the Malaysian market, dividends are paid on an annual basis while the approval for share buybacks is only valid for one year. Therefore, managers will only have control over using payout policy to reflect anticipation on firm prospects within that one year period.

Following Zhou and Ruland (2006) and Pham et al. (2021), firm size, leverage and growth opportunity are included as control variables. In addition, cash holdings (Yun, Ahmad, Jebran & Muhammdad, 2020) and liquidity (Samo & Murad, 2019) of firms are found to be influential on firm performance, and are thus also included as control variables. Accordingly, the control variables incorporate the natural log of total assets, cash holdings, leverage ratio, market-to-book and current ratio. Moreover, industry dummies and year dummies are also added to adjust for industry and time effects for panel data.

$$FP_{i,t+1} = \alpha_0 + \alpha_1 DIV_{it} + \alpha_2 TA_{it} + \alpha_3 CASH_{it} + \alpha_4 LEVER_{it} + \alpha_5 MTB_{it} + \alpha_6 CUR_{it} + INDdum + YEARDum + \varepsilon_{it}$$

(Equation 3.1)

$$FP_{i,t+1} = \alpha_0 + \alpha_1 REPR_{it} + \alpha_2 TA_{it} + \alpha_3 CASH_{it} + \alpha_4 LEVER_{it} + \alpha_5 MTB_{it} + \alpha_6 CUR_{it} + INDdum + YEARDum + \varepsilon_{it}$$

(Equation 3.2)

$$FP_{i,t+1} = \alpha_0 + \alpha_1 TPAY_{it} + \alpha_2 TA_{it} + \alpha_3 CASH_{it} + \alpha_4 LEVER_{it} + \alpha_5 MTB_{it} + \alpha_6 CUR_{it} + INDdum + YEARDum + \varepsilon_{it}$$

(Equation 3.3)

Where,

FP = Firm performance represented by earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow

DIV = Dividend ratio

REPR = Share repurchase ratio

TPAY	= Total payout ratio
TA	= Total assets
CASH	= Cash holdings
LEVER	= Leverage ratio
MTB	= Market-to-book ratio
CUR	= Current ratio
INDdum	= Industry dummies
YEARdum	= Year dummies

3.5 Variables Definition

Table 3.1 shows how the dependent, independent and control variables are computed with the respective formulas. The dependent variables are represented by earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow. The independent variable encompasses the dividend ratio, share repurchase ratio and total payout ratio, while the control variables consist of the total assets, cash holdings, leverage ratio, market-to-book ratio and current ratio.

Earnings per share is one of the proxies used to represent future firm performance, and is calculated as net income available to common shareholders divided by the number of shares outstanding. Earnings per share indicates the amount of money a company earns for each share of its stock and is used as an indicator for the market performance of firm. Firms with higher earnings per share are usually more profitable than firms with lower earnings per share. However, given the same earnings, a company's earnings per share are easily manipulated through a reduction in the number of shares outstanding (Rist & Pizzica, 2014).

Earnings yield is another proxies for future firm performance, which is calculated as net income divided by the market value of equity in the current study. Earnings yield, also known as the inverse of the price-to-earnings ratio, is a valuation metric that is useful in evaluating the rate of return for individual stocks in the market (Vernimmen & Quiry, 2009).

Another proxies for the future firm performance is represented by return on assets, which is computed as net income divided by total assets, to indicate the profitability of firm. Return on assets measures a company's efficiency in generating profit from its total assets. A higher return on assets indicates better asset management and higher profitability. One of the limitations of return on assets is that it is not comparable across industries, as every industry has a different asset base (Tracey, 2012).

On the other hand, return on equity serves as another proxy for future firm performance, is calculated as net income divided by total shareholders' equity. Return on equity evaluates a company's profitability relative to total equity, excluding the company's total liabilities. Return on equity indicates the ability of a company to convert equity investments into profits. A company that reinvests its earnings wisely tends to show an increasing return on equity over time (Tracey, 2012).

Operating income which acts as another proxy for firm performance is the difference between sales and total operating expenses. Analyzing a company's operating income is useful as it does not consider interest, taxes or other one-off items that might skew the net income. An increased operating income indicates that the firm earns more revenue while keeping operating expenses and manufacturing costs under control (Rist & Pizzica, 2014). Following Lie (2005), operating income will be scaled by total assets to measure the operating performance of the sample firms.

Operating cash flow is another metric that can be used to measure a firm's operating performance. Operating cash flow is the net cash flow from operating activities, which is calculated as the sum of funds from operations and funds used for other operating activities and extraordinary items. Operating cash flow is vital as it indicates the amount of cash generated from the company's core operations (Jury, 2012). In the context of this study, the operating cash flow is another proxy for firm performance and will be scaled by total assets to be comparable to operating income.

Following the study by Lee and Suh (2011), the dividend ratio is computed as total cash dividends scaled by total assets, representing the amount of cash paid to shareholders relative to the firm's total assets. While most of the prior studies focus on the dividend changes, the current study only concentrates on the magnitude of dividend payments, as it is believed under the signaling theory of information content hypothesis that the announcement of the corporate payout decision alone contain positive private information about the growth prospects of the firm, as postulated by Bhattacharya (1979) and Miller and Rock (1985).

Similarly, the share repurchase ratio is calculated as the amount of consideration paid by a company for buying back its common shares scaled by total assets, which denotes the amount of cash used for share buyback relative to the firm's total assets. Meanwhile, the total payout is computed as the ratio of total cash dividends paid plus consideration paid for share repurchases to total assets.

For the present study, total assets are used as a proxy for firm size by taking the natural logarithm of total assets. Total assets represent the combined value of all assets owned by a company, which can be found on the company's balance sheet. An asset is

anything with measurable value that can provide future economic benefits. Total assets are the sum of current and non-current assets, or total equity and total liabilities (Spurga, 2004).

Cash and equivalents scaled by total assets represent the firm's cash holdings and act as a proxy for free cash flow in this study. Cash and equivalents, include cash on hand, demand deposits, bank overdrafts, bank balances and short-term investments. Cash holdings are often used to denote the financial strength of a company. A high level of cash holdings is a powerful sign that the company has sufficient funds to expand operations and pay off debt (Baker & Powell, 2009). However, too much cash might also lead to agency cost problems (Jensen, 1986).

The leverage ratio, also known as the debt-to-equity ratio, measures a company's ability to meet its financial obligations and is calculated as total liabilities divided by total equity. The leverage ratio measures the proportion of debt and equity in the company's capital structure. A high leverage ratio means the company employs a higher level of debt to finance its equity. The leverage ratio also functions as an indicator of risk, as firms that fail to pay back their debt obligations would probably experience a higher possibility of financial distress (Baker & Powell, 2009).

The market-to-book ratio, computed as market capitalization divided by total book value in the current study, is used to represent a growth opportunity. The market-to-book ratio evaluates the current market value relative to its book value. A market-to-book ratio of less than one indicates that the company is undervalued, whereas more than one implies that the company is overvalued (Baker & Powell, 2009).

The current ratio, calculated as current assets divided by current liabilities, indicates a firm's liquidity. The current ratio measures the ability of a firm to pay short-term debt with

its current assets. The higher the current ratio, the more capable a company is of meeting its short-term obligations, usually due within a year. Generally, a good current ratio is above one (Tracey, 2012).

Table 3.1: Definition of Variables

Variables	Definition
Dependent Variables	
Firm Performance (FP)	Proxy by earnings per share, earnings yield, return on assets, return on equity, operation income and operating cash flow
Earnings Per Share	Net income / Number of shares outstanding
Earnings Yield	Net income / Market value of equity
Return on Assets	Net income / Total assets
Return on Equity	Net income / Book value of equity
Operating Income	Operating income / Total assets
Operating Cash Flow	Net cash flow from operating activities / Total assets
Independent Variables	
Dividend Ratio (DIV)	Total cash dividends / Total assets
Share Repurchase Ratio (REPR)	Total consideration paid for share repurchase / Total assets
Total Payout Ratio (TPAY)	(Total cash dividends + Total consideration paid for share repurchase) / Total assets
Control Variables	
Total Assets (TA)	Natural log of total assets
Cash Holdings (CASH)	Cash and equivalents / Total assets
Leverage Ratio (LEVER)	Total liabilities / Total equity
Market-to-Book Ratio (MTB)	Market capitalization / Book value of equity
Current Ratio (CUR)	Current assets / Current liabilities

3.6 Hypothesis Setting

The information content hypothesis posits that management's view of future firm performance could be reflected by changes in corporate payout policy (Miller & Modigliani, 1961). The information signaling hypothesis for share repurchases claimed that repurchase announcements should be followed by positive news about profitability or cash flows (Grullon & Michaely, 2004). If repurchase programs convey good news about future profitability, then financial performance should improve in the years following repurchase announcements (Huang et al., 2010). Meanwhile, Giambona et al. (2006) asserted that the information signaling hypothesis is valid when payout size is positively related to future firm performance.

Therefore, a positive and significant relationship is expected between payout size and future firm performance. The dividend ratio, share repurchase ratio and total payout ratio should be positively related to any of the proxies for future firm performance in order to validate the signaling theory of information content hypothesis. A positive relationship found at a significance level of 10%, 5% or 1% indicates that the payout policy of dividend and/or share repurchase has been implemented to signal a better prospect of firm performance. Subsequently, the alternative hypotheses are set up accordingly as follows:

Hypothesis 1:

Dividend ratio is significantly and positively related to future earnings per share.

Hypothesis 2:

Dividend ratio is significantly and positively related to future earnings yield.

Hypothesis 3:

Dividend ratio is significantly and positively related to future return on assets.

Hypothesis 4:

Dividend ratio is significantly and positively related to future return on equity.

Hypothesis 5:

Dividend ratio is significantly and positively related to future operating income.

Hypothesis 6:

Dividend ratio is significantly and positively related to future operating cash flow.

Hypothesis 7:

Share repurchase ratio is significantly and positively related to future earnings per share.

Hypothesis 8:

Share repurchase ratio is significantly and positively related to future earnings yield.

Hypothesis 9:

Share repurchase ratio is significantly and positively related to future return on assets.

Hypothesis 10:

Share repurchase ratio is significantly and positively related to future return on equity.

Hypothesis 11:

Share repurchase ratio is significantly and positively related to future operating income

Hypothesis 12:

Share repurchase ratio is significantly and positively related to future operating cash flow.

Hypothesis 13:

Total payout ratio is significantly and positively related to future earnings per share.

Hypothesis 14:

Total payout ratio is significantly and positively related to future earnings yield.

Hypothesis 15:

Total payout ratio is significantly and positively related to future return on assets.

Hypothesis 16:

Total payout ratio is significantly and positively related to future return on equity.

Hypothesis 17:

Total payout ratio is significantly and positively related to future operating income.

Hypothesis 18:

Total payout ratio is significantly and positively related to future operating cash flow.

3.7 Panel Data Analysis

Panel data analysis is a statistical technique for analyzing two-dimensional panel data that includes both time series and cross-sectional data (Baltagi, 2013) and will be used in the current study. In particular, panel data consists of data collection among the same entity over multiple time frames. A balanced panel data set comprises a complete set of observations obtained throughout a specific period, whereas an unbalanced panel data set shows missing values for a certain period. Panel data analysis is often employed to overcome the problem of bias caused by unobserved heterogeneity (Baltagi, 2013). A standard panel data regression model is illustrated below.

$$y_{it} = \alpha + \beta x_{it} + \varepsilon_{it} \quad (\text{Equation 3.4})$$

, where y refers to the dependent variable and x is the independent variable among individual i over time t , with α and β as the parameters and a stochastic error term ε .

In most panel data sets, a primary issue to be considered is the modeling of the error term in the regression model (Baltagi, 2013). There are three competing formulations: the pooled ordinary least square (OLS) model; the random effect model; and the fixed effect model. The pooled OLS model follows the assumptions for the classical linear regression model, which treats the error term as identically and independently distributed and that the explanatory variables are uncorrelated with the error term. The pooled OLS model, which ignores panel data, basically assumes that the intercept and slope are constant across units and time. However, such an assumption might be restrictive and may result in heterogeneity bias. Heterogeneity means that the units are all different from one another in fundamental unmeasured ways, and these vary across individuals, firms, states or countries, as suggested by panel data (Baltagi, 2013).

The second and third approaches, namely the random effect and fixed effect models, assume that each unit has its own intercepts while restricting the slope to homogenous (Baltagi, 2013). As shown below, the error term is broken down into a composite error term, which has two separate parts to account for heterogeneity.

$$\varepsilon_{it} = \lambda_i + \mu_{it} \quad (\text{Equation 3.5})$$

, whereby μ_{it} is the regular error term which assumes that the disturbances are identically and independently distributed with mean zero and constant variance, while λ_i denotes the unobserved heterogeneity or also known as the individual-specific effect and it

is time-invariant. There are two options for treating individual effects λ_i , which are the random effect or fixed effect. A random effect assumes λ_i is drawn independently from some probability distribution, while a fixed effect assumes that λ_i is constant across individuals (Baltagi, 2013).

3.7.1 Random Effect Model

The model is called a random effect model if λ_i is assumed to be a random variable and is uncorrelated with the independent variable, $\text{Cov}(\lambda_i, x_{it}) = 0$. In a random effect model, the individual effect is random, which is shown by the following equation.

$$y_{it} = \alpha + \beta x_{it} + \lambda_i + \mu_{it} \quad (\text{Equation 3.6})$$

, whereby λ_i is assumed to be part of the composite error term ε_{it} with both errors λ_i and μ_{it} having respective variances (Baltagi, 2013).

A Breusch-Pagan Lagrangian Multiplier (LM) test is used to discriminate between the pooled OLS model and the random effect model (Hsiao, 2014). The presence of the individual-specific term λ easily distinguishes the random effect model from the pooled OLS. If the variance for λ equals zero, then ordinary least square would be the best linear unbiased estimator as there would be no autocorrelation. Otherwise, the random effect model would be more appropriate. Hence, the Breusch-Pagan LM test's hypothesis is as below, with the rejection of the null hypothesis proving the suitability of the random effect model over the pooled OLS model.

$$H_0: \sigma^2_{\lambda} = 0$$

$$H_a: \sigma^2_{\lambda} > 0$$

3.7.2 Fixed Effect Model

The model is called a fixed effect model when the individual-specific effects exist, or more crucially, when λ_i is correlated to the regressor, $\text{Cov}(\lambda_i, x_{it}) \neq 0$.

The fixed effect model is illustrated in the following equation:

$$y_{it} = (\alpha + \lambda_i) + \beta x_{it} + \mu_{it} \quad (\text{Equation 3.7})$$

, where λ now become part of the constant but varies by individual. When the covariance between the individual specific effect and any regressor is not zero, neither OLS nor random effects provide consistent estimators (Hsiao, 2014). The Hausman Test is commonly used in applied panel data analysis to determine whether to select a random effect model or a fixed effect model based on the following hypothesis. The rejection of the null hypothesis proves the suitability of the fixed effect model over the random effect model (Hsiao, 2014).

$$H_0: \text{Cov}(\lambda_i, X_{it}) = 0$$

$$H_a: \text{Cov}(\lambda_i, X_{it}) \neq 0$$

3.8 Diagnostic Checks

After deriving an appropriate model for panel data analysis, various diagnostic checks are performed to enhance the robustness of the model. Three critical assumptions under the classical linear regression model are considered under panel data analysis (Baltagi, 2013; Hsiao, 2014). The first assumption states that no linearity of relationships or multicollinearity exists in panel data. The second assumption contends that the variance of each error term is constant, also known as homoskedasticity. The third assumption claims serial independence or no correlation between the error terms (Baltagi, 2013; Hsiao, 2014).

Hence, diagnostic tests are carried out to detect the panel data's multicollinearity, heteroskedasticity, and serial correlation problems.

3.8.1 Multicollinearity

Multicollinearity occurs when high correlations exist between two or more independent variables in an equation model. Multicollinearity is a concern since it makes the independent variables statistically insignificant and adversely affects the regression analysis results (Gujarati & Porter, 2009; Hill, Griffiths & Lim, 2012). Thus, it is important to detect multicollinearity in every model. The intensity of multicollinearity in regression analysis is measured by the variance inflation factor (VIF). A VIF is calculated by taking a predictor and regressing it against every other predictor in the model to create an R-squared value to be inserted into the following formula.

$$VIF = \frac{1}{1-R_i^2} \quad (\text{Equation 3.8})$$

A VIF is a metric that counts the number of inflated variances induced by multicollinearity. A high VIF indicates that the associated independent variable is highly correlated with the other independent variables in the model. The greater the VIF, the less reliable the regression results become. In general, a VIF of above 10 indicates a high correlation and significant multicollinearity problem, which requires further investigation or correction (Gujarati & Porter, 2009; Hill et al., 2012). In the current study, Stata software was used to compute the mean VIF to detect multicollinearity. The rule of thumb states that if the mean VIF is greater than 10, there is a multicollinearity problem.

3.8.2 Heteroskedasticity

Heteroskedasticity occurs when the variance of the residuals, commonly known as the error term, is uneven throughout a range of measured values. More technically, heteroskedasticity results in an uneven dispersion of the residuals when running a regression analysis. The presence of heteroskedasticity violates the assumption of the classical linear regression model, which states that the error term is constant or homogeneous (Greene, 2008; Gujarati & Porter, 2009).

In general, models involving a wide range of values are supposedly more prone to heteroskedasticity due to the huge discrepancies between the smallest and the largest values. The existence of heteroskedasticity causes the population used in the regression to contain unequal variance, which may invalidate the analysis results as the biased coefficient estimates produced can affect the precision of the regression result. Heteroskedasticity also causes p-values to be lower than they should be. This problem can lead to the incorrect conclusion that a model term is statistically significant when it is not (Greene, 2008; Gujarati & Porter, 2009).

Heteroskedasticity is tested with the Modified Wald Test for Groupwise Heteroskedasticity in a fixed effect regression model using Stata. Rejection of the null hypothesis indicates that the variances are not constant, and there is a heteroskedasticity problem. The heteroskedasticity problem is to be overcome by generating a robust standard error for the model (Daniel, 2007).

$H_0: \sigma^2(i) = \sigma^2$ for all i (Homoskedasticity)

$H_a: \sigma^2(i) \neq \sigma^2$ for all i (Heteroskedasticity)

3.8.3 Serial Correlation

One of the classical linear regression model's assumptions states that the error terms are not correlated. A serial correlation problem is induced whenever such an assumption is violated. Serial correlation, also known as autocorrelation, is the transition of error terms from one period to the next. In other words, the error for one period is related to the error for the next period. Serial correlation causes the calculated variances of the regression coefficients to be skewed. The significance of the t-statistics will appear to be greater than it actually is, resulting in incorrect hypothesis testing (Gujarati & Porter, 2009; Hill et al., 2012).

The Woolridge Test is used to test for autocorrelation in panel data with Stata. Rejection of the null hypothesis indicates the presence of serial correlation in the model. The serial correlation problem and heteroskedasticity can be rectified by producing a cluster standard error for the model (Wooldridge, 2013; Daniel, 2007).

H_0 : No first-order autocorrelation.

H_a : First-order autocorrelation.

3.9 Sensitivity Tests

The sensitivity test is conducted to test the parameters that might affect the output and stability of the results. Hence, the sample data is partitioned into a few subsamples under different specifications. The first criteria to be considered will be on the financial crisis period. The second specification is based on the firm's market capitalization following the FTSE market indices. Next, the influence of payout frequency on the information content of dividends and share repurchases is evaluated with a quartile analysis. Lastly, the independent

variables used in the main analysis are replaced with alternative proxy variables to check for any difference in results.

3.9.1 Financial Crisis

The subprime mortgage crisis in the U.S. mainly triggered the Global Financial Crisis in 2008. A subprime mortgage is a loan secured by property offered at a higher interest rate to borrowers with weak or no credit histories. However, housing prices in the U.S. declined tremendously, followed by a housing bubble, eventually leading to a devaluation of the mortgaged properties and mortgage delinquencies. Borrowers of the bank started to default on their loans, and banks in the U.S. also began to collapse. Lehman Brothers was the first investment bank to announce bankruptcy during that time. The subprime mortgage crisis caused a global recession that impacted market participants from all over the world, either directly or indirectly (Abidin & Rasiah, 2011).

Although Malaysia was insulated from the direct effects of the subprime mortgage crisis, the impact of the Global Financial Crisis of 2008 on Malaysia's economic growth was inevitable. Malaysia recorded a GDP growth rate of 0.1% in the last quarter of 2008 and contracted by -6.2% in the first quarter of 2009 before falling further by -3.9% in the second quarter of the year (Abidin & Rasiah, 2011). Therefore, it is crucial to consider the crisis period in order to evaluate the true relationship between corporate payout policy and future firm performance under normal circumstances. By excluding the observations from the financial crisis period of 2008 to 2009, Equation 3.1 and Equation 3.2 will be rerun to check whether there is any difference in results compared to the main analysis.

In the meantime, the 2020 stock market crash due to the COVID-19 pandemic is not considered under the sensitivity analysis for crisis effect. This is because the purpose of the

current study is to examine the effects of current payout on future firm performance, and the samples only include observations up until the examination of payout size in 2019 against future firm performance in 2020. As claimed by the information content hypothesis, the action of dividend or share repurchase intends to portray positive signals about firm prospects. Therefore, any announcement of dividend or share repurchase in the current period already takes into account the expectations of managers on future firm performance without foreseeing any unpredictable circumstances in the future. Therefore, the financial crisis in 2020 is not included as part of the sensitivity analysis since the first case of COVID-19 was only traced on January 25, 2020.

3.9.2 Market Index

Market capitalization is computed by multiplying the current stock price by the total number of shares outstanding and is used to assess the aggregate market value of a company. Market capitalization is especially useful in comparing the company's relative size to other companies. While market capitalization shows how much the company is worth, total assets represent the combined value of all assets owned by a company, which can be found on the company's balance sheet. Even though total assets indicate the size of a company, this measurement does not tell the whole story. Many companies have substantial intangible assets that do not appear on their balance sheets because there is no objective way to measure their value. Examples of intangible assets include the company's brand, patents, trademarks, copyrights and goodwill. Therefore, market capitalization can capture the company's actual market value by incorporating those intangible assets that do not appear on the balance sheet and cannot be measured objectively. Since market capitalization is directly related to the stock price, it takes into account both the unmeasurable intangible assets and also the growth prospects, market share, the company's reputation and the psychology of the market itself.

So, a company's market capitalization is determined based on perceptions unrelated to its performance (Hoffmann, 2018).

Accordingly, the sample firms for the current study will be divided into two groups based on the FTSE Bursa Malaysia Indices list, which can be categorized into large or small capitalization. The first group is filtered according to the FTSE Bursa Malaysia Top 100 Index, which is a composite of the FTSE Bursa Malaysia KLCI Index and the FTSE Bursa Malaysia Mid 70 Index. The FTSE Bursa Malaysia KLCI Index comprises the 30 largest companies listed on the main board by total market capitalization, while the FTSE Bursa Malaysia Mid 70 Index includes the next 70 listed companies on the main board by total market capitalization. Meanwhile, the second group consists of the constituents listed under the FTSE Bursa Malaysia Small Cap Index, which includes companies within the top 98% of the Bursa Malaysia main market, excluding constituents of the FTSE Bursa Malaysia Top 100 Index.

This filter resulted in subsamples of 327 dividend paying firms and 137 share repurchasing firms listed under the FTSE Bursa Malaysia Small Cap Index, while 45 dividend paying firms and 23 share repurchasing firms listed under the FTSE Bursa Malaysia Top 100 Index. Equation 3.1 and Equation 3.2 will be rerun to test whether there is any difference after dividing the sample into small-cap and large-cap.

3.9.3 Payout Frequency

As Jagannathan and Stephens (2003) found that a higher frequency of share buybacks resulted in an improvement in the operating performance of share repurchasing companies, the current study will divide the sample data into four portions according to the payout frequency. By using quartile analysis, the bottom 25% payout frequency is to be compared

with the top 25% payout frequency of the sample to check whether there is any difference in results from the ones obtained in the main analysis.

Accordingly, a total of 95 dividend paying firms lie under the category of the top 25% payout frequency, which has a count of 20 dividend payments for each company throughout the sample period, while a total of 96 dividend paying firms lie under the category of the bottom 25% payout frequency, which shows a count of 1 to 8 dividend payments for each company throughout the sample period.

Meanwhile, a total of 42 share repurchasing firms with a count of 12 to 20 share buyback for each firm throughout the sample period lie under the category of the top 25% payout frequency, whereas there are a total of 47 share repurchasing firms which show a count of 1 to 4 share buyback for each firm throughout the sample period lie under the category of the bottom 25% payout frequency.

3.9.4 Alternative Explanatory Variable

In the context of the current study, dividend payout ratio and buyback ratio are employed as alternative explanatory variables to replace the initially used dividend ratio and share repurchase ratio. Equation 3.1 and Equation 3.2 are repeated with alternative independent variables to compare the regression results with those obtained from the main analysis.

The alternative proxy of dividend payout ratio is calculated as the ratio of total dividends to the company's net income. Typically, the dividend payout ratio represents the percentage of earnings distributed to shareholders as dividends and is an important financial

metric to evaluate whether or not a company can continue its dividend distribution program over the long run (Amidu & Abor, 2006; Jabbouri, 2016).

Meanwhile, the alternative proxy of buyback ratio helps measure a company's ability to return value to its shareholders and is computed as the amount of money paid by a company to buy back its common stock over a period of time divided by the company's market capitalization at the beginning of the buyback period (Dittmar, 2000).

3.10 Chapter Summary

The sample data for the current study comprises public listed companies in Malaysia which involved in dividend and share repurchase within the sample period of 2000 to 2020. As illustrated by the research framework, this study aims to test the information content hypothesis by investigating the relationship between corporate payout policy and future firm performance. The dependent variables represent by proxies of earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow, all measured in the first year after payout, while the independent variable consists of dividend, share repurchase and total payout. Panel data analysis will be employed to run the regression model with Stata software. Meanwhile, the diagnostic checks of multicollinearity, heteroskedasticity and serial correlation will be used for robustness testing. Furthermore, sensitivity tests considering the financial crisis period, the Bursa Malaysia market indices, the payout value, the payout frequency and alternative explanatory variables are conducted to compare whether the results from the main analysis alter under varying specifications.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Chapter Overview

The first part of this chapter briefly explains the statistical properties of the research models based on descriptive statistics and correlation coefficients. The following section presents the results of panel data analysis between respective payout policies and various proxies of future firm performance measured in the following year of payout. The third section displays the results of sensitivity analyses that consider different specifications such as the crisis effect, market index, quartile analysis based on payout frequency and alternative proxies for independent variables.

4.2 Descriptive Statistics

The descriptive statistics outline the minimum, maximum, mean and standard deviation for all the variables in the research model. This will provide some general features about the firm size, cash holdings, leverage, growth, liquidity and earnings performance among the sample firms. Table 4.1 presents the statistical description among the variables for the dividend sample with a total of 7100 observations. The minimum value for the dividend ratio is 0, while the maximum value is 5.3. This shows that dividends are not paid out on a regular basis. Rather, the sample firms may omit dividend payments in certain years. The mean and standard deviation for earnings per share are 0.095 and 0.546, while return on equity has a mean of 0.044 and a standard deviation of 0.646. This value shows that the dispersion for the earnings per share and return on equity data is wide.

Table 4.1: Descriptive Statistics for Dividend Sample

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Earnings per share	7100	0.0950	0.5460	-27.6000	9.3280
Earnings yield	7100	0.0698	0.2549	-5.0369	10.0000
Return on assets	7100	0.0317	0.2174	-3.0172	11.0597
Return on equity	7100	0.0443	0.6460	-35.4162	7.2109
Operating income	7100	0.0422	0.1699	-3.1053	11.1066
Operating cash flow	7100	0.0520	0.0955	-0.7563	-0.8491
Dividend ratio	7100	0.0213	0.0798	0.0000	5.2966
Total assets	7100	19.5889	3.2391	0.0000	25.9098
Cash holdings	7100	0.1287	0.1324	-0.1377	2.2462
Leverage ratio	7100	1.0410	10.3477	-562.4351	535.7405
Market-to-book ratio	7100	1.5985	22.9439	-240.2467	1888.727
Current ratio	7100	3.1372	7.5828	0.0000	253.0300

Table 4.2 describes the statistical properties among the variables for the share repurchase sample, with a total of 3060 observations. The share repurchase ratio shows a minimum value of 0 and a maximum value of 0.14, indicating that share buybacks are not conducted consistently. The mean values for return on equity, operating income and operating cash flow are similar at about 0.05. The spread for the data on earnings per share and operating income is relatively bigger, with the respective standard deviations recorded at 0.25 and 0.21.

Table 4.2: Descriptive Statistics for Share Repurchase Sample

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Earnings per share	3060	0.1011	0.2460	-2.0840	2.7000
Earnings yield	3060	0.0717	0.1758	-4.6371	2.0000
Return on assets	3060	0.0363	0.1670	-1.4580	8.1044
Return on equity	3060	0.0578	0.1646	-2.1531	1.0166
Operating income	3060	0.0495	0.2139	-1.0555	11.1066
Operating cash flow	3060	0.0541	0.0820	-0.6380	-0.5629
Share repurchase ratio	3060	0.0021	0.0070	0.0000	0.1361
Total assets	3060	19.9189	3.0617	0.0000	25.3595
Cash holdings	3060	0.1267	0.1241	-0.1201	1.4057
Leverage ratio	3060	1.2364	5.7795	-65.7348	176.7343
Market-to-book ratio	3060	1.7095	34.1470	-3.1741	1888.7270
Current ratio	3060	2.5592	4.8947	0.0000	218.4500

Table 4.3 displays the descriptive statistics among the mutual payer for a total of 2880 observations. The total payout ratio with a minimum value of 0 and a maximum value of 0.69 shows that there is a period where both dividends and share repurchases are not conducted by the mutual payers. Earnings per share and operating income show a relatively large dispersion of data, as shown by the respective standard deviations of 0.24 and 0.22. The means for operating income and operating cash flow are similar at approximately 0.05.

Table 4.3: Descriptive Statistics for Mutual Payer

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
Earnings per share	2880	0.1052	0.2377	-1.8080	2.0340
Earnings yield	2880	0.0726	0.1782	-4.6371	2.0000
Return on assets	2880	0.0378	0.1691	-1.4580	8.1044
Return on equity	2880	0.0609	0.1595	-2.1531	1.0166
Operating income	2880	0.0518	0.2186	-1.0555	11.1066
Operating cash flow	2880	0.0547	0.0797	-0.6380	0.5629
Total payout ratio	2880	0.0108	0.0301	0.0000	0.6857
Total assets	2880	19.9639	3.0951	0.0000	25.3595
Cash holdings	2880	0.1250	0.1173	-0.1201	1.4057
Leverage ratio	2880	1.2594	5.9383	-65.7348	176.7343
Market-to-book ratio	2880	1.7394	35.1935	-3.1741	1888.7270
Current ratio	2880	2.5504	4.9819	0.0000	218.4500

4.3 Correlation Test

A correlation test is conducted to check if two independent variables are strongly correlated. The correlation coefficient will indicate the strength of the linear relationship between each of the independent variables. Table 4.4 presents the correlation matrix for the dividend sample. All the correlation coefficients show a value less than 1, thus indicating that there is no direct relationship between all the independent variables and that no independent variable shall be removed. Leverage ratio is negatively related to the dividend

ratio, but only by a weak association of -0.003. This implies that companies with higher leverage tend to pay lower dividends because more earnings are retained for debt repayment.

Table 4.5 shows the correlation matrix for the share repurchase sample. The correlation coefficient of less than 1 indicates the absence of a strong correlation between all the independent variables. The highest correlation coefficient of 0.36 is found between cash holdings and the current ratio, which indicates a weak, positive relationship.

Table 4.6 displays the correlation matrix for the mutual payer. A correlation coefficient of less than 1 shows that a perfect linear relationship does not exist among all the independent variables. A weak but positive association is found between cash holdings and total payout ratio, at about 0.17. This shows that the sample firms tend to distribute excess cash on hand through share repurchase.

Table 4.4: Correlation Matrix for Dividend Sample

	Dividend ratio	Total assets	Cash holdings	Leverage ratio	Market-to-book ratio	Current ratio
Dividend ratio	1.0000					
Total assets	0.0620	1.0000				
Cash holdings	0.1714	0.1174	1.0000			
Leverage ratio	-0.0028	0.0344	-0.0173	1.0000		
Market-to-book ratio	0.0623	-0.0048	-0.0017	0.1330	1.0000	
Current ratio	0.0286	0.0105	0.3711	-0.0219	-0.0070	1.0000

Table 4.5: Correlation Matrix for Share Repurchase Sample

	Share repurchase ratio	Total assets	Cash holdings	Leverage ratio	Market-to-book ratio	Current ratio
Share repurchase ratio	1.0000					
Total assets	0.0525	1.0000				
Cash holdings	0.1099	0.1406	1.0000			
Leverage ratio	-0.0242	0.0631	-0.0484	1.0000		
Market-to-book ratio	0.0023	-0.0306	-0.0102	0.0544	1.0000	
Current ratio	0.0259	0.0195	0.3644	-0.0519	-0.0061	1.0000

Table 4.6: Correlation Matrix for Mutual Payer

	Total payout ratio	Total assets	Cash holdings	Leverage ratio	Market-to-book ratio	Current ratio
Total payout ratio	1.0000					
Total assets	0.0699	1.0000				
Cash holdings	0.1651	0.1582	1.0000			
Leverage ratio	-0.0327	0.0638	-0.0456	1.0000		
Market-to-book ratio	0.0063	-0.0312	-0.0136	0.0539	1.0000	
Current ratio	0.0492	0.0205	0.3814	-0.0499	-0.0061	1.0000

4.4 Results of Panel Data Analysis for Dividend

Table 4.7 (on page 93) shows the results of panel data analysis between dividend and future firm performance based on Equation 3.1 for a sample of 7100 observations. The result in the second column of Table 4.7 is based on the dependent variable of earnings per share measured in the first year after dividend payout. First, the Breusch-Pagan LM test discriminates between the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that the random effect model is more appropriate and has a firm-specific effect. Next, the Hausman test compares the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus signifying that the fixed effect model is more suitable than the random effect model and that each company has a different intercept. The mean variance inflation factor of 1.08, which is less than 10, indicates no multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and there is a heteroskedasticity problem. However, the null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level, so there is no serial correlation problem. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated by an R-squared of 4.12%. However, the result from the final model does not show any significant relationship between the independent variable of dividend ratio and the dependent variable of future earnings per share. As for the control variables, the current ratio is negatively related to future earnings per share at a 5% significance level, while cash holdings are positively related to future earnings per share at a 1% significance level. While

the dividend does not influence future earnings per share, dividend paying firms with higher cash holdings and lower liquidity tend to yield higher earnings per share in the first year after the dividend payout.

The third column of Table 4.7 presents the result of panel data analysis based on the dependent variable of earnings yield measured in the following year of dividend payout. First, the Beusch-Pagan LM test distinguishes between the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that the random effect model is more suitable and has a firm-specific effect. Next, the Hausman test compares the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus implying that each company has a different intercept and that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, indicates no multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the model. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. Hence, the serial correlation problem does not exist in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated by the R-squared value of 5.56%. The result from the final model shows that the dividend ratio, which acts as the independent variable, is not significantly related to the dependent variable of future earnings yield. As for the control variables, only cash holdings

are positively related to future earnings yield at a 10% significance level. Even though dividends do not seem to influence future earnings yield, dividend paying firms with higher cash holdings tend to generate a higher earnings yield in the first year after dividend payout.

The fourth column of Table 4.7 displays the results of panel data analysis based on the dependent variable of return on assets measured in the succeeding year of dividend payout. First, the Breusch-Pagan LM distinguishes between the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus suggesting that there is a firm-specific effect and that the random effect model is more appropriate. Next, the Hausman test is carried out to compare the random effect and the fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus signifying that each company has a different intercept and the fixed effect model is more suitable than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, implies no multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and a heteroskedasticity problem exists in the model. However, the null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level, which thus implies the absence of a serial correlation problem in the data. The heteroskedasticity problem is thus rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated by an R-squared of 1.53%. However, the result from the final model does not show any significant relationship between the independent variable of dividend ratio and the dependent variable of future return on assets. As for the control variables, cash holdings are

positively related to future return on assets at a 1% significance level, while the current ratio is negatively related to future return on assets at a 10% significance level. While dividends do not seem to affect future return on assets, dividend paying firms with higher cash holdings and lower liquidity tend to yield a higher return on assets in the year following a dividend payout.

The fifth column of Table 4.7 presents the result of panel data analysis based on the dependent variable of return on equity measured in the subsequent year of dividend payout. First, the Breusch-Pagan LM test discriminates between the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus implying the existence of firm-specific effects and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test compares the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus indicating that all firms have different intercepts and the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, shows no multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and there is a heteroskedasticity problem in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. Therefore, the serial correlation problem does not exist in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated by R-squared at 1.46%. The result from the final model does not show any

significant relationship between the independent variable of dividend ratio and the dependent variable of future return on equity. As for the control variables, cash holdings are positively related to future return on equity at a 1% significance level, whereas leverage ratio is negatively related to future return on equity at a 10% significance level. While dividends do not seem to influence future return on equity, dividend paying firms with higher cash holdings but a lower leverage ratio tend to produce a higher return on equity in the subsequent year of dividend payout.

The sixth column of Table 4.7 displays the result of panel data analysis based on the dependent variable of operating income measured in the first year after dividend payout. First, the Breusch-Pagan LM test discriminates between the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating the firm-specific effect and that the random effect model is more appropriate than the pooled OLS model. Next, the Hausman test compares the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus indicating that the fixed effect model is more appropriate than the random effect model and that all firms have different intercepts. The mean variance inflation factor of 1.08, which is less than 10, shows no multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and there is a heteroskedasticity problem in the model. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level, and thus there is no serial correlation in the data. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated by R-squared at 2.03%. The result from the final model shows that the dividend ratio, which acts as the independent variable, is not significant in relation to the dependent variable of future operating income. As for the control variables, cash holdings are positively related while the current ratio is negatively associated with future operating income, both at a 1% significance level. While the dividend does not seem to influence future operating income, firms with higher cash holdings and lower liquidity tend to generate higher operating income in the year following the dividend payout.

The seventh column of Table 4.7 displays the result of panel data analysis based on the dependent variable of operating cash flow measured in the subsequent year of dividend payout. First, the Breusch-Pagan LM test discriminates between the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that the random effect model is more appropriate than the pooled OLS model with the existence of firm-specific effects. Next, the Hausman test compares the random effect model with the fixed effect model. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus implying that the fixed effect model is more suitable than the random effect model and that each company has a different intercept. The mean variance inflation factor of 1.08, which is less than 10, shows no multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level, and thus there is no serial correlation problem in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated by R-squared at 2.27%. The result from the final model shows that there is no significant relationship between the independent variable of dividend ratio and the dependent variable of future operating cash flow. As for the control variables, cash holdings show a negative association with future operating cash flow at a 1% significance level, while total assets are positively related to future operating cash flow at a 10% significance level. While the dividend does not seem to affect future operating cash flow, dividend paying firms with bigger firm sizes but lower cash holdings tend to generate higher operating cash flow in the year following the dividend payout.

Overall, Table 4.7 does not reflect any significant results between dividends and various proxies of future firm performance, even though the overall significance of all the models is proven with F-statistics. The insignificant association found between dividend ratio and future earnings per share, future earnings yield, future return on assets, future return on equity, future operating income and future operating cash flow thus rejects Hypothesis 1, Hypothesis 2, Hypothesis 3, Hypothesis 4, Hypothesis 5 and Hypothesis 6 respectively.

Generally, both cash holdings and liquidity appear to be significant factors influencing future firm performance among dividend paying firms. A positive relationship is found between cash holdings and most of the proxies for future firm performance, except for future operating cash flow. Meanwhile, the current ratio is negatively related to future earnings per share, future return on assets and future operating income. The contradictory situation between cash holdings and liquidity ratio in this case might be due to the likelihood that the current liabilities of the dividend paying firms exceed their current assets. Besides, the cash holdings variable in this case is only represented by cash and cash equivalents, while

the measurement of current assets under the current ratio also includes account receivables and inventories.

In short, the information content hypothesis of dividends is not supported, as projected from the insignificant relationship between dividends and various proxies of future firm performance. Such a result is consistent with the findings by Grullon et al. (2005), Wolff and Auret (2009) and Rajverma et al. (2019), who also found an insignificant influence of dividends on future earnings per share, future return on assets and future return on equity, but contradicts Farrukh et al. (2017), who proved that dividend policies significantly influence firm value as signified by improvements in earnings per share and return on equity.

To summarize, local managers in Malaysia do not place great importance on using dividends as a signaling device for future earnings. In other words, the expectation of future earnings is not a factor determining the current dividend policy of firms. One possibility for such a phenomenon may be explained by the fact that companies in Malaysia tend to mobilize more capital for further development, thus increasing the amount of retained earnings and influencing the dividend policy of the firm. Such an explanation is further justified by Pandey (2003), who provided evidence that Malaysian public listed companies follow less stable dividend policies. Moreover, firms with a stable dividend policy are more likely to incorporate information on future earnings into their dividend decisions, as suggested by Lee et al. (2012).

Table 4.7: Results of Panel Data Analysis for Equation 3.1

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.1111 [-0.83] (0.406)	0.0193 [0.51] (0.611)	0.0366 [0.78] (0.438)	0.0778 [1.46] (0.144)	0.0870 [1.41] (0.160)	0.0413*** [5.42] (0.000)
Dividend ratio	0.1168 [0.76] (0.448)	0.0080 [0.23] (0.821)	0.0065 [0.11] (0.915)	0.1767 [0.78] (0.438)	0.0691 [0.96] (0.336)	0.0706 [1.20] (0.231)
Total assets	0.0053 [0.64] (0.525)	0.0036 [1.58] (0.115)	-0.0022 [-0.74] (0.463)	-0.0040 [-1.26] (0.208)	-0.0036 [-0.94] (0.348)	0.0007* [1.79] (0.074)
Cash holdings	0.3032*** [2.92] (0.004)	0.1205* [1.96] (0.051)	0.1294*** [2.98] (0.003)	0.2261*** [2.93] (0.004)	0.0604*** [2.76] (0.006)	-0.0691*** [-3.72] (0.000)
Leverage ratio	-0.0037 [-1.33] (0.185)	-0.0004 [-0.55] (0.585)	-0.0013 [-1.36] (0.173)	-0.0033* [-1.87] (0.062)	-0.0005 [-1.42] (0.156)	0.0001 [1.14] (0.255)
Market-to-book ratio	0.0003 [1.26] (0.208)	0.0001 [0.62] (0.534)	0.0001 [1.28] (0.200)	0.0004 [1.05] (0.294)	0.0001 [1.08] (0.280)	0.0001 [0.81] (0.419)

Table 4.7 continued

Current ratio	-0.0013** [-2.15] (0.033)	-0.0003 [0.60] (0.550)	-0.0006* [-1.69] (0.092)	-0.0019 [-1.60] (0.111)	-0.0006*** [-2.67] (0.008)	0.0001 [0.30] (0.761)
Observations	7100	7100	7100	7100	7100	7100
R-squared	0.0412	0.0556	0.0153	0.0146	0.0203	0.0227
F-statistics	6.43*** (0.000)	6.95*** (0.000)	6.90*** (0.000)	6.24*** (0.000)	5.33*** (0.000)	5.18*** (0.000)
Breusch-Pagan LM Test	1410.02*** (0.000)	77.16*** (0.000)	87.42*** (0.000)	50.49*** (0.000)	625.86*** (0.000)	3687.06*** (0.000)
Hausman Test	184.15*** (0.000)	40.00*** (0.000)	307.46*** (0.000)	124.16*** (0.000)	289.67*** (0.000)	463.50*** (0.000)
Multicollinearity	1.08	1.08	1.08	1.08	1.08	1.08
Heteroskedasticity	9.1e+07*** (0.000)	1.8e+07*** (0.000)	1.3e+07*** (0.000)	8.7e+07*** (0.000)	4.8e+06*** (0.000)	95045.42*** (0.000)
Serial Correlation	1.82 (0.178)	2.18 (0.141)	0.00 (0.991)	0.00 (0.976)	1.32 (0.252)	0.32 (0.571)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.5 Results of Panel Data Analysis for Share Repurchase

Table 4.8 (on page 104) demonstrates the results of panel data analysis between share repurchase and future firm performance based on Equation 3.2 for a sample of 3060 observations. The result in the second column of Table 4.8 is based on the dependent variable of earnings per share measured in the subsequent year of share buyback. First, the Breusch-Pagan LM test is used to compare the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that there are firm-specific effects and that the random effect model is more appropriate than the pooled OLS model. Next, the Hausman test is run to discriminate between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus denoting that each company has a different intercept and the fixed effect model is more suitable than the random effect model. The mean variance inflation factor of 1.07, which is less than 10, shows that a multicollinearity problem does not exist in the model. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which indicates that the variances are not constant and that a heteroskedasticity problem exists in the data. The p-value for the Wooldridge test, which is less than 0.01, rejects the null hypothesis at a 1% significance level and suggests the presence of a serial correlation problem. The heteroskedasticity and serial correlation problems are rectified by generating a cluster standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated at 4.66% by the R-squared. The result from the final model shows that the explanatory variable of share repurchase ratio is positively related to the dependent variable of future earnings per share at a 10% significance level. For a one unit change in the share

repurchase ratio, future earnings per share will increase by 1.0227 units. Thus, the higher the share repurchase ratio, the higher the earnings per share that will be yielded in the following year. As for the control variables, only cash holdings are positively related to future earnings per share at a 5% significance level. Hence, share repurchasing firms with higher cash holdings tend to produce higher earnings per share in the subsequent year of the share buyback.

The third column of Table 4.8 displays the results of panel data analysis based on the dependent variable of earnings yield measured in the following year of share buyback. First, the Breusch-Pagan LM test is applied to compare the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating a firm-specific effect and that the random effect model is more appropriate than the pooled OLS model. Next, the Hausman test is conducted to distinguish between the random effect and fixed effect models. The null hypothesis cannot be rejected as the p-value exceeds the significance level, thus implying that the random effect model is more suitable than the fixed effect model. The mean variance inflation factor of 1.07, which is less than 10, signifies the absence of a multicollinearity problem in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level, indicating no serial correlation problem in the model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated at only 0.57% by the R-squared. The final model is rectified with robust standard errors, and the result shows that the share repurchase ratio, which acts as the explanatory variable, is positively related to the dependent variable of future earnings yield at a 5% significance level. For a one unit change in the share repurchase ratio, the future earnings

yield will increase by 0.8283 units. Hence, the higher the share repurchase ratio, the higher the earnings yield generated in the following year. As for the control variables, the market-to-book ratio and cash holdings are positively related to future earnings yield at a 1% and 10% significance level, respectively. Thus, share repurchasing firms with higher cash holdings and greater growth opportunities tend to generate a higher earnings yield in the first year after a share buyback.

The fourth column of Table 4.8 presents the results of panel data analysis based on the dependent variable of return on assets measured in the succeeding year of share buyback. First, the Breusch-Pagan LM test is used to compare the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating the presence of a firm-specific effect and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is run to distinguish between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus implying that each company has a different intercept and that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.07, which is less than 10, indicates the absence of a multicollinearity problem in the model. As the p-value for the Modified Wald Test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. Hence, the serial correlation problem does not occur in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model with the goodness-of-fit indicated at 1.22% by the R-squared. The result for the final model shows that the share repurchase ratio, which acts as the explanatory variable, is positively related to the dependent variable of future return on assets at a 1% significance level. For a one unit change in the share repurchase ratio, the future return on assets will increase by 0.8715 units. Thus, the higher the share repurchase ratio, the higher the return on assets generated in the following year. As for the control variable, only cash holdings show a positive relationship with future return on assets at a 1% significance level. Hence, share repurchasing firms with higher cash holdings tend to produce a higher return on assets in the following year of share buyback.

The fifth column of Table 4.8 shows the results of panel data analysis based on the dependent variable of return on equity measured in the subsequent year of share buyback. First, the Breusch-Pagan LM test is utilized to compare the pooled OLS and random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus signifying that there is a firm-specific effect and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is conducted to distinguish between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus indicating that each company has a different intercept and that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.07, which is less than 10, indicates the absence of a multicollinearity problem in the data. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The p-value for the Wooldridge test, which is less than 0.10, rejects the null hypothesis at a 10% significance level and suggests a serial

correlation problem in the model. The heteroskedasticity and serial correlation problems are rectified by generating a cluster standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated at 6.68% by the R-squared. The result from the final model shows that the share repurchase ratio, which acts as the explanatory variable, is positively related to the dependent variable of future return on equity at a 1% significance level. For a one unit change in the share repurchase ratio, the future return on equity will increase by 1.0179 units. Thus, the higher the share repurchase ratio, the higher the return on equity yielded in the following year. As for the control variables, cash holdings and the market-to-book ratio reflect a positive relationship with future return on equity, both at a 1% significance level, while the current ratio is negatively related to future return on equity at a 1% significance level. Hence, share repurchasing firms with higher cash holdings and greater growth opportunities but lower liquidity tend to produce a higher return on equity in the following year of share buyback.

The sixth column of Table 4.8 shows the result of panel data analysis based on the dependent variable of operating income measured in the subsequent year of share buyback. First, the Breusch-Pagan LM test compares the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that there is a firm-specific effect and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is run to distinguish between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus implying that each company has a different intercept and that the fixed effect model is more appropriate than the random

effect model. The mean variance inflation factor of 1.07, which is less than 10, indicates the absence of a multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. So, no serial correlation problem occurs in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated at 1.36% by the R-squared. The result from the final model shows that the explanatory variable of share repurchase ratio is positively related to the dependent variable of future operating income at a 1% significance level. For a one unit change in the share repurchase ratio, the future operating income will increase by 1.0034 units. Thus, the higher the share repurchase ratio, the higher the operating income generated in the following year. As for the control variables, cash holdings are positively related to future operating income at a 5% significance level, while the current ratio is negatively related to future operating income at a 1% significance level. Hence, share repurchasing firms with higher cash holdings but lower liquidity tend to produce higher operating income in the subsequent year of the share buyback.

The seventh column of Table 4.8 displays the results of panel data analysis based on the dependent variable of operating cash flow measured in the succeeding year of share buyback. First, the Breusch-Pagan LM test compares the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1%

significance level, thus indicating that the firm-specific effect exists and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is run to distinguish between the random effect and fixed effect models. The null hypothesis is rejected at a 1% significance level as the p-value is less than 0.01, thus suggesting that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.07, which is less than 10, indicates the absence of a multicollinearity problem. The p-value for the Modified Wald test, which is less than 0.01, rejects the null hypothesis at a 1% significance level and implies the existence of a heteroskedasticity problem in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. Hence, the serial correlation problem does not exist in the model. The heteroskedasticity problem is thus rectified with a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with the goodness-of-fit indicated at 1.92% by the R-squared. The result of the final model shows that the explanatory variable of share repurchase ratio is positively related to the dependent variable of future operating cash flow at a 1% significance level. For a one unit change in the share repurchase ratio, the future operating cash flow will increase by 0.6209 units. Hence, the higher the share repurchase ratio, the higher the operating cash flow to be generated in the following year. As for the control variables, total assets are positively related to future operating cash flow at a 5% significance level, while the current ratio and cash holdings are negatively related to future operating cash flow at a 1% and 10% significance level, respectively. Thus, share repurchasing firms with a larger firm size but lower liquidity and cash holdings tend to generate higher operating cash flow in the year following the share buyback.

Overall, Table 4.8 show significant results between share repurchase and all proxies of future firm performance. The share repurchase ratio is significantly and positively related to future earnings per share, future earnings yield, future return on assets, future return on equity, future operating income and future operating cash flow. The positive and significant relationship thus supports Hypothesis 7, Hypothesis 8, Hypothesis 9, Hypothesis 10, Hypothesis 11 and Hypothesis 12 respectively.

When comparing the magnitudes of the coefficients, it shows that the share repurchase ratio has a stronger effect on future earnings per share, future return on equity and future operating income, in comparison to other proxies of future firm performance. The result shows that earnings per share of the firm are enhanced after share repurchase. The transaction of a share buyback decreases the amount of shares outstanding as companies reabsorb a portion of ownership that was previously distributed to investors. The cancellation of treasury shares will then lead to an improvement in earnings per share and thus enhance shareholder value. In the meantime, the goodness-of-fit depicted by R-squared shows that the variation of future earnings per share and future return on equity is best explained by the share repurchase ratio. Hence, management of the public listed companies in Malaysia tends to use share buybacks to signal improvements in future financial and operating performance.

Generally, the control variable of cash holdings is positively related to most of the proxies for future firm performance, except for the future operating cash flow, which shows a negative association. Meanwhile, the control variable of the market-to-book ratio is positively related to future earnings yield and future return on equity. On the other hand, the control variable of the current ratio is only negatively related to future return on equity, future operating income and future operating cash flow. Therefore, cash holdings, growth

opportunities and liquidity of firms are considered significant factors in influencing future firm performance among share repurchasing firms.

The positive coefficient shown for both cash holdings and market-to-book ratio shows that the share repurchasing firms in the sample are financing investment opportunities of the firms with sufficient cash on hand, which is expected to lead to an improvement in earnings yield in the future. The opposite direction of the coefficients obtained for cash holdings and the current ratio show that the current liabilities of share repurchasing firms exceed the current assets despite the higher cash holdings, which only partially fall under the current assets. Despite the higher cash holdings, the liquidity is still lower for the share repurchasing firms, indicating that the current liabilities that need to be met exceed the current assets of the firms. In this case, share repurchasing firms with less cash holdings and hence lower liquidity are not efficient in meeting their current liabilities. But sufficient total assets for firms lead to better management of working capital, and thus make them capable of generating higher operating cash flow in the future.

To conclude, the information signaling hypothesis for share repurchases is validated by the significant and positive relationship obtained between the share repurchase ratio and all proxies of future firm performance. In other words, Malaysian firms tend to use share buybacks to signal optimistic information about their firm's prospects from the perspective of stock, financial and operating performance as depicted by future earnings per share, future earnings yield, future return on assets, future return on equity, future operating income and future operating cash flow. Such result is consistent with the studies by Lie (2005), Wu (2012) and Al-Sharawi (2022), who found improvements in operating income, return on assets and return on equity for the sample companies following the share repurchase.

Table 4.8: Results of Panel Data Analysis for Equation 3.2

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	0.0047 [0.16] (0.874)	0.0013 [0.03] (0.972)	0.1214 [0.86] (0.391)	0.0028 [0.16] (0.870)	0.2280 [1.22] (0.225)	0.0463*** [4.23] (0.000)
Share repurchase ratio	1.0227* [1.94] (0.054)	0.8283** [2.42] (0.016)	0.8715*** [4.30] (0.000)	1.0179*** [3.07] (0.003)	1.0034*** [4.19] (0.000)	0.6209*** [3.31] (0.001)
Total assets	0.0003 [0.21] (0.837)	0.0031 [1.60] (0.109)	-0.0050 [-0.69] (0.490)	0.0003 [0.25] (0.799)	-0.0094 [-0.98] (0.327)	0.0013** [2.38] (0.019)
Cash holdings	0.1527** [2.24] (0.026)	0.0522* [1.66] (0.097)	0.1016*** [2.77] (0.006)	0.1503*** [3.13] (0.002)	0.0812** [2.05] (0.042)	-0.0436* [-1.86] (0.064)
Leverage ratio	0.0003 [0.29] (0.774)	-0.0002 [-1.16] (0.247)	0.0001 [0.40] (0.692)	0.0009 [0.36] (0.722)	0.0003 [1.21] (0.228)	0.0009 [1.46] (0.147)
Market-to-book ratio	0.0001 [2.38] (0.188)	0.0001*** [3.58] (0.000)	0.0001 [0.38] (0.706)	0.0001*** [3.06] (0.003)	-0.0001 [-0.50] (0.615)	-0.0001 [-1.27] (0.205)

Table 4.8 continued

Current ratio	-0.0006 [-1.12] (0.266)	0.0004 [0.72] (0.470)	-0.0004 [-1.11] (0.267)	-0.0012*** [-2.95] (0.004)	-0.0017*** [-5.03] (0.000)	-0.0014*** [-4.55] (0.000)
Observations	3060	3060	3060	3060	3060	3060
R-squared	0.0466	0.0057	0.0122	0.0668	0.0136	0.0192
F-statistics	5.03*** (0.000)	22.83*** (0.001)	6.37*** (0.000)	10.68*** (0.000)	7.80*** (0.000)	7.62*** (0.000)
Breusch-Pagan LM Test	3781.35*** (0.000)	18.55*** (0.000)	66.39*** (0.000)	668.08*** (0.000)	53.81*** (0.000)	1583.02*** (0.000)
Hausman Test	39.29*** (0.000)	8.67 (0.913)	19.97*** (0.003)	45.89*** (0.000)	21.56*** (0.002)	73.57*** (0.000)
Multicollinearity	1.07	1.07	1.07	1.07	1.07	1.07
Heteroskedasticity	2.0e+06*** (0.000)	-	3.6e+06*** (0.000)	1.5e+05*** (0.000)	6.8e+06*** (0.000)	22138.03*** (0.000)
Serial Correlation	11.02*** (0.001)	1.43 (0.234)	1.97 (0.162)	2.97* (0.087)	1.63 (0.203)	0.97 (0.326)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.6 Results of Panel Data Analysis for Mutual Payer

Table 4.9 (on page 114) displays the results of panel data analysis between total payout and future firm performance based on Equation 3.3 among mutual payers for 2880 observations. The result in the second column of Table 4.9 is based on the dependent variable of earnings per share measured in the subsequent year of payout. First, the Breusch-Pagan LM test is used to compare the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that there are firm-specific effects and that the random effect model is more appropriate than the pooled OLS model. Next, the Hausman test is run to discriminate between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus denoting that each company has a different intercept and the fixed effect model is more suitable than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, shows that a multicollinearity problem does not exist in the model. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which indicates that the variances are not constant and that a heteroskedasticity problem exists in the data. The p-value for the Wooldridge test, which is less than 0.01, rejects the null hypothesis at a 1% significance level and suggests the presence of a serial correlation problem. The heteroskedasticity and serial correlation problems are rectified by generating a cluster standard error for the fixed effect model.

The F-statistics prove the overall significance of the model with a goodness-of-fit of 5.53% recorded by the R-squared. The result from the final model shows that the independent variable of total payout ratio is insignificant to the dependent variable of future

earnings per share. As for the control variables, both cash holdings and market-to-book ratio are positively related to future earnings per share at a 5% significance level.

The third column of Table 4.9 displays the results of panel data analysis based on the dependent variable of earnings yield measured in the following year of payout. First, the Breusch-Pagan LM test is applied to compare the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating a firm-specific effect and that the random effect model is more appropriate than the pooled OLS model. Next, the Hausman test is conducted to distinguish between the random effect and fixed effect models. The null hypothesis is rejected as the p-value exceeds the 10% significance level, thus implying that the fixed effect model is more suitable than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, signifies the absence of a multicollinearity problem in the data. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which indicates that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level, indicating no serial correlation problem in the model. The heteroskedasticity problem is rectified by generating robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model with a goodness-of-fit of 10.84% recorded by the R-squared. The result of the final model shows that the total payout ratio, which acts as the explanatory variable, is not significantly related to the dependent variable of future earnings yield. As for the control variables, only total assets are positively

related to future earnings yield at a 5% significance level. Thus, mutual payers with larger firm size tend to portray higher earnings yield in the first year after the payout.

The fourth column of Table 4.9 presents the results of panel data analysis based on the dependent variable of return on assets measured in the following year of payout. First, the Breusch-Pagan LM test is used to compare the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating the presence of a firm-specific effect and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is run to distinguish between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus implying that each company has a different intercept and that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, indicates the absence of a multicollinearity problem in the model. As the p-value for the Modified Wald Test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. Hence, the serial correlation problem does not occur in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with a goodness-of-fit of only 0.99% recorded by the R-squared. The result of the final model shows that the independent variable of total payout ratio is positively related to the dependent variable of future return on assets at a 5% significance level. For a one unit change in the total payout

ratio, the future return on assets will increase by 0.2156 units. Thus, the higher the total payout ratio, the higher the return on assets generated in the following year. As for the control variable, only cash holdings show a positive relationship with future return on assets at a 1% significance level.

The fifth column of Table 4.9 shows the results of panel data analysis based on the dependent variable of return on equity measured in the subsequent year of payout. First, the Breusch-Pagan LM test is utilized to compare the pooled OLS and random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus signifying that there is a firm-specific effect and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is conducted to distinguish between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus indicating that each company has a different intercept and that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, indicates the absence of a multicollinearity problem in the data. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level and indicates the absence of a serial correlation problem in the model. The heteroskedasticity problem is rectified by generating a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with a goodness-of-fit of 6.78% recorded by the R-squared. The result from the final model shows that the explanatory

variable of total payout ratio is insignificant to the dependent variable of future return on equity. As for the control variables, cash holdings and market-to-book ratio reflect a positive relationship with future return on equity, both at a 1% significance level, while the current ratio is negatively related to future return on equity at a 1% significance level. Hence, share repurchasing firms with higher cash holdings and greater growth opportunities but lower liquidity tend to produce a higher return on equity in the following year of total payout.

The sixth column of Table 4.9 shows the result of panel data analysis based on the dependent variable of operating income measured in the subsequent year of payout. First, the Breusch-Pagan LM test compares the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that there is a firm-specific effect and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is run to distinguish between the random effect and fixed effect models. The p-value, which is less than 0.01, rejects the null hypothesis at a 1% significance level, thus implying that each company has a different intercept and that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, indicates the absence of a multicollinearity problem. As the p-value for the Modified Wald test is less than 0.01, the null hypothesis can be rejected at a 1% significance level, which means that the variances are not constant and that a heteroskedasticity problem exists in the data. The null hypothesis for the Wooldridge test cannot be rejected as the p-value exceeds the significance level. So, no serial correlation problem occurs in the model. The heteroskedasticity problem is rectified by producing a robust standard error for the fixed effect model.

The F-statistics prove the overall significance of the model, with a goodness-of-fit of 1.44% recorded by the R-squared. The result from the final model shows that the explanatory variable of total payout ratio is positively related to the dependent variable of future operating income at a 5% significance level. For a one unit change in the total payout ratio, the future operating income will increase by 0.2544 units. Thus, the higher the total payout ratio, the higher the operating income generated in the following year. As for the control variables, cash holdings are positively related to future operating income at a 10% significance level, while the current ratio is negatively related to future operating income at a 1% significance level. Hence, mutual payers that are involved in both dividend payout and share repurchase tend to produce higher operating income in the subsequent year when the firms have higher cash holdings but lower liquidity.

The seventh column of Table 4.9 shows the results of panel data analysis based on the dependent variable of operating cash flow measured in the succeeding year of total payout. First, the Breusch-Pagan LM test compares the pooled OLS and the random effect model. Since the p-value is less than 0.01, the null hypothesis can be rejected at a 1% significance level, thus indicating that the firm-specific effect exists and that the random effect model is more suitable than the pooled OLS model. Next, the Hausman test is run to distinguish between the random effect and fixed effect models. The null hypothesis is rejected at a 1% significance level as the p-value is less than 0.01, thus suggesting that the fixed effect model is more appropriate than the random effect model. The mean variance inflation factor of 1.08, which is less than 10, indicates the absence of a multicollinearity problem. The p-value for the Modified Wald test, which is less than 0.01, rejects the null hypothesis at a 1% significance level and implies the existence of a heteroskedasticity problem in the data. The null hypothesis for the Wooldridge test is rejected at a 10%

significance level, indicating that there is a serial correlation problem in the model. The heteroskedasticity and serial correlation problems are rectified with a cluster standard error for the fixed effect model.

The F-statistics prove the overall significance of the model with a goodness-of-fit of 3.49% recorded by the R-squared. The result of the final model shows that the explanatory variable of total payout ratio is not significantly related to the dependent variable of future operating cash flow. As for the control variables, total assets are positively related to future operating cash flow at a 1% significance level, while the current ratio and cash holdings are negatively related to future operating cash flow at a 1% and 10% significance level, respectively. Thus, share repurchasing firms with a larger firm size but lower liquidity and cash holdings tend to generate higher operating cash flow in the succeeding year of total payout.

Overall, Table 4.9 only shows significant results between total payout and certain proxies of future firm performance among mutual payers. The total payout ratio is significantly and positively related to future return on assets and future operating income. The positive and significant relationships thus only support Hypothesis 15 and Hypothesis 17, while rejecting Hypothesis 13, Hypothesis 14, Hypothesis 16 and Hypothesis 18. When comparing the magnitude of the coefficients, it shows that the total payout ratio portrays a rather similar strength of effect towards both future return on assets and future operating income. In terms of goodness-of-fit, the value of R-squared shows that the variation of future operating income is best explained by the total payout ratio, as compared to the dependent variable of future return on assets.

Generally, the control variable of cash holdings is positively related to most of the proxies for future firm performance, except for the future earnings yield which show insignificant relationship, and the future operating cash flow, which reveals a negative association. Meanwhile, the control variable of the current ratio is only negatively related to future return on equity, future operating income and future operating cash flow. Therefore, cash holdings and liquidity of firms are considered significant factors in influencing future return on equity, future operating income and future operating cash flow among mutual payers.

Hence, mutual payers that are involved in both dividend payout and share repurchase tend to portray improved performance in the following year when the firms hold more cash on hand, which enables the growing opportunities of the firms to be fulfilled and is thus expected to generate a positive prospect in the future. The opposite direction of the coefficients obtained for cash holdings and the current ratio show that the current liabilities of mutual payers exceed the current assets despite the higher cash holdings, which only partially fall under the current assets. Despite the higher cash holdings, the liquidity is still lower for mutual payers, indicating that the current liabilities that need to be met exceed the current assets of firms.

To conclude, the information content hypothesis is validated by the significant and positive relationship obtained between the total payout ratio and specific proxies of future firm performance. In other words, Malaysian firms that are involved in both dividend payout and share repurchase also tend to use their corporate payout policy to signal optimistic information about their firm's prospects, particularly from the perspective of financial and operating performance as depicted by future return on assets and future operating income.

Table 4.9: Results of Panel Data Analysis for Equation 3.3

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	0.0139 [0.37] (0.709)	0.0041 [0.10] (0.924)	0.1271 [0.87] (0.388)	0.0106 [0.62] (0.537)	0.2366 [1.22] (0.226)	0.0411*** [3.72] (0.000)
Total payout ratio	0.2000 [1.22] (0.224)	-0.0381 [-0.49] (0.626)	0.2156** [2.41] (0.017)	0.2836 [1.44] (0.153)	0.2544** [2.12] (0.036)	0.1437 [1.27] (0.205)
Total assets	0.0004 [0.27] (0.791)	0.0052** [2.09] (0.038)	-0.0051 [-0.69] (0.491)	0.0007 [0.63] (0.528)	-0.0097 [-0.98] (0.330)	0.0015*** [2.70] (0.008)
Cash holdings	0.1608** [2.19] (0.030)	0.0727 [1.37] (0.173)	0.0957** [2.50] (0.014)	0.1398*** [2.88] (0.005)	0.0754* [1.80] (0.074)	-0.0453* [-1.93] (0.055)
Leverage ratio	0.0003 [0.26] (0.792)	-0.0003 [-1.08] (0.281)	0.0001 [0.43] (0.670)	0.0010 [0.37] (0.710)	0.0003 [1.23] (0.223)	0.0009 [1.43] (0.154)
Market-to-book ratio	0.0001** [2.24] (0.026)	-0.0001 [-0.43] (0.665)	0.0001 [0.35] (0.729)	0.0001*** [2.80] (0.006)	-0.0001 [-0.52] (0.606)	-0.0001 [-1.24] (0.217)

Table 4.9 continued

Current ratio	-0.0006 [-1.12] (0.266)	0.0005 [1.41] (0.160)	-0.0004 [-1.10] (0.271)	-0.0012*** [-2.87] (0.005)	-0.0017*** [-4.88] (0.000)	-0.0014*** [-4.57] (0.000)
Observations	2880	2880	2880	2880	2880	2880
R-squared	0.0553	0.1084	0.0099	0.0678	0.0144	0.0349
F-statistics	5.14*** (0.000)	10.94*** (0.000)	3.15*** (0.006)	10.90*** (0.000)	5.28*** (0.000)	6.35*** (0.000)
Breusch-Pagan LM Test	4451.49*** (0.000)	15.97*** (0.000)	28.97*** (0.000)	460.96*** (0.000)	24.41*** (0.000)	1164.70*** (0.000)
Hausman Test	32.52*** (0.000)	11.27* (0.080)	26.87*** (0.000)	57.79*** (0.000)	25.65*** (0.000)	67.76*** (0.000)
Multicollinearity	1.08	1.08	1.08	1.08	1.08	1.08
Heteroskedasticity	3.3e+06*** (0.000)	3.9e+05*** (0.000)	3.3e+06*** (0.000)	1.5e+05*** (0.000)	9.3e+06*** (0.000)	19631.49*** (0.000)
Serial Correlation	10.32*** (0.002)	1.48 (0.226)	2.07 (0.153)	1.56 (0.213)	1.61 (0.206)	2.89* (0.091)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.7 Sensitivity Analysis

Sensitivity tests are conducted to further examine the robustness of the main analysis and to test whether the results vary under different specifications. The first subsection presents the regression results of panel data analysis with the exclusion of the financial crisis period. The second subsection displays the regression results between the Small Cap Index and the Top 100 Index according to the FTSE Bursa Malaysia market indices. The next section employs quartile analysis to compare regression results between the top 25% and the bottom 25% by payout frequency. The last section employs alternative proxies with dividend payout ratio and buyback ratio as explanatory variables to check for any difference in results.

4.7.1 Exclusion of Crisis Period

Table 4.10 (on page 119) displays the regression results between dividend and future firm performance for a sample of 6390 observations after excluding the crisis periods of 2008 and 2009. Rejection of the null hypotheses for both the Breusch-Pagan LM test and the Hausman test at 1% significance level conclude that the most appropriate model would be the fixed effect model. There is no multicollinearity problem in the model since the mean VIF of 1.08 is less than 10. However, heteroskedasticity exists, and the final models with such problem shall be rectified with robust standard error. Meanwhile, the F-statistics prove the overall significance of all the models at their respective R-squared, which indicate greater goodness-of-fit for the dependent variables of future earnings per share and future earnings yield at 4.01% and 4.83%, respectively, in comparison to other proxies of future firm performance.

However, the results for all the final models show that the independent variable of dividend ratio is not significantly related to all proxies of future firm performance as denoted

by future earnings per share, future earnings yield, future return on assets, future return on equity, future operating income and future operating cash flow. Due to the insignificant relationship obtained, the information content hypothesis for dividends is thus rejected. In short, dividend paying firms do not reveal any predictive power towards future firm performance even after excluding the crisis period. This result is similar to the results from the main analysis which further enhance the robustness of the results.

As for the control variables, the result from Table 4.10 indicates that cash holdings are significantly and positively related to most of the proxies for future firm performance, except for future operating cash flow, which reveals a negative association. Meanwhile, the current ratio is significantly and negatively related to future earnings per share, future return on assets and future operating income. Thus, dividend paying firms with lower liquidity tend to perform better in the future since they have sufficient cash to meet current debt obligations of the firm.

Table 4.11 (on page 121) shows the regression results between share repurchase and future firm performance for a sample of 2754 observations after excluding the crisis periods of 2008 and 2009. Rejection of the null hypotheses for both the Breusch-Pagan LM test and Hausman test at the 1% significance level conclude that the most appropriate model is the fixed effect model, except for the dependent variable of future earnings yield. No multicollinearity problem is found in the model, but heteroskedasticity is detected. Hence, the fixed effect model with heteroskedasticity problem is rectified with robust standard error. The F-statistics prove the overall significance of all the models at their respective R-squared, which indicate relatively stronger goodness-of-fit for the dependent variables of future earnings per share and future return on equity at 4.58% and 6.47% respectively.

As a result, a positive relationship is shown by the share repurchase ratio towards future return on assets, future return on equity, future operating income and future operating cash flow, all at a 1% significance level, while the share repurchase ratio is positively associated with future earnings per share at a 10% significance level. When comparing the magnitudes of the coefficients, it shows that the share repurchase ratio has a stronger effect on future earnings per share, future return on assets, future return on equity and future operating income relative to other proxies of future firm performance. In the meantime, the goodness-of-fit depicted by R-squared shows that the variation of future earnings per share and future return on equity is best explained by the share repurchase ratio.

As for the control variables, cash holdings are positively and significantly related to most of the proxies of future firm performance, except for future operating cash flow. Meanwhile, the current ratio is significantly and negatively associated with most of the proxies of future firm performance, except for future earnings per share, future earnings yield and future return on assets. Thus, share repurchasing firms with higher cash holdings but lower liquidity tend to yield a higher return on equity and operating income in the first year after a share buyback. The contradictory sign of coefficients between cash holdings and liquidity might be due to the overwhelming current liabilities to be met by the firms.

After filtering out the financial crisis period, the same group of findings as in the main analysis have been obtained, except for the future earnings yield. The information signaling hypothesis for share repurchases is still supported by the significant and positive relationships between share repurchases and various proxies of future firm performance.

Table 4.10: Regression Results between Dividend and Future Firm Performance with Exclusion of Crisis Period 2008-2009

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.1147 [-0.84] (0.399)	0.0208 [0.54] (0.593)	0.0360 [0.75] (0.454)	0.0852 [1.50] (0.135)	0.0863 [1.37] (0.172)	0.0406*** [5.48] (0.000)
Dividend ratio	0.1152 [0.75] (0.452)	0.0061 [0.18] (0.857)	-0.0005 [-0.01] (0.993)	0.1787 [0.77] (0.443)	0.0687 [0.96] (0.335)	0.0686 [1.21] (0.228)
Total assets	0.0055 [0.65] (0.519)	0.0036 [1.50] (0.134)	-0.0021 [-0.71] (0.476)	-0.0043 [-1.28] (0.202)	-0.0036 [-0.91] (0.363)	0.0007* [1.80] (0.073)
Cash holdings	0.3129*** [2.88] (0.004)	0.1139* [1.83] (0.068)	0.1332*** [2.97] (0.003)	0.2125*** [2.63] (0.009)	0.0622*** [2.68] (0.008)	-0.0587*** [-3.22] (0.001)
Leverage ratio	-0.0037 [-1.31] (0.192)	-0.0005 [-0.65] (0.514)	-0.0013 [-1.36] (0.176)	-0.0028* [-1.73] (0.084)	-0.0005 [-1.44] (0.151)	0.0001 [1.18] (0.237)
Market-to-book ratio	0.0003 [1.26] (0.209)	0.0001 [0.75] (0.454)	0.0001 [1.28] (0.201)	0.0004 [1.04] (0.297)	0.0001 [1.07] (0.285)	0.0001 [0.71] (0.477)

Table 4.10 continued

Current ratio	-0.0014** [-2.17] (0.030)	0.0004 [0.89] (0.372)	-0.0006* [-1.68] (0.094)	-0.0018 [-1.49] (0.138)	-0.0006** [-2.56] (0.011)	0.0001 [0.34] (0.732)
Observations	6390	6390	6390	6390	6390	6390
R-squared	0.0401	0.0483	0.0143	0.0155	0.0192	0.0223
F-statistics	5.53*** (0.000)	6.18*** (0.000)	6.40*** (0.000)	6.19*** (0.000)	5.03*** (0.000)	3.42*** (0.000)
Breusch-Pagan LM Test	1020.53*** (0.000)	89.30*** (0.000)	56.71*** (0.000)	47.82*** (0.000)	448.19*** (0.000)	2943.40*** (0.000)
Hausman Test	161.38*** (0.000)	48.67*** (0.000)	272.74*** (0.000)	132.88*** (0.000)	247.89*** (0.000)	423.28*** (0.000)
Multicollinearity	1.08	1.08	1.08	1.08	1.08	1.08
Heteroskedasticity	9.9e+07*** (0.000)	1.7e+07*** (0.000)	1.8e+07*** (0.000)	8.4e+07*** (0.000)	5.2e+06*** (0.000)	94141.13*** (0.000)
Serial Correlation	1.16 (0.282)	4.98** (0.026)	0.88 (0.348)	1.82 (0.178)	1.19 (0.276)	0.01 (0.982)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.11: Regression Results between Share Repurchase and Future Firm Performance with Exclusion of Crisis Period 2008-2009

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	0.0054 [0.18] (0.856)	0.0003 [0.01] (0.993)	0.1207 [0.86] (0.393)	0.0006 [0.03] (0.972)	0.2283 [1.22] (0.224)	0.0474*** [4.50] (0.000)
Share repurchase ratio	1.1275* [1.82] (0.071)	0.4345 [1.59] (0.113)	1.0026*** [5.12] (0.000)	1.1701*** [3.29] (0.001)	1.1574*** [4.34] (0.000)	0.7206*** [3.65] (0.000)
Total assets	0.0003 [0.19] (0.849)	0.0027 [1.39] (0.164)	-0.0050 [-0.69] (0.490)	0.0004 [0.37] (0.713)	-0.0094 [-0.99] (0.324)	0.0012** [2.28] (0.024)
Cash holdings	0.1480** [2.05] (0.043)	0.0633* [1.82] (0.068)	0.0971** [2.61] (0.010)	0.1478*** [2.96] (0.004)	0.0760* [1.88] (0.062)	-0.0353 [-1.43] (0.154)
Leverage ratio	0.0003 [0.29] (0.775)	-0.0002 [-1.00] (0.318)	0.0001 [0.36] (0.717)	0.0009 [0.37] (0.715)	0.0003 [1.20] (0.232)	0.0009 [1.44] (0.152)
Market-to-book ratio	0.0001** [2.35] (0.020)	0.0001*** [4.33] (0.000)	0.0001 [0.34] (0.731)	0.0001*** [3.16] (0.002)	-0.0001 [-0.58] (0.565)	-0.0001* [-1.89] (0.061)

Table 4.11 continued

Current ratio	-0.0006 [-1.15] (0.253)	0.0005 [1.15] (0.248)	-0.0003 [-0.88] (0.381)	-0.0012*** [-2.84] (0.005)	-0.0017*** [-4.95] (0.000)	-0.0014*** [-4.44] (0.000)
Observations	2754	2754	2754	2754	2754	2754
R-squared	0.0458	0.0056	0.0113	0.0647	0.0134	0.0131
F-statistics	5.16*** (0.000)	28.65*** (0.000)	8.24*** (0.000)	9.23*** (0.000)	7.95*** (0.000)	4.80*** (0.000)
Breusch-Pagan LM Test	2706.41*** (0.000)	18.49*** (0.000)	43.70*** (0.000)	467.82*** (0.000)	33.90*** (0.000)	1282.98*** (0.000)
Hausman Test	37.01*** (0.000)	5.39 (0.495)	15.82** (0.015)	47.81*** (0.000)	17.68*** (0.007)	70.07*** (0.000)
Multicollinearity	1.07	1.07	1.07	1.07	1.07	1.07
Heteroskedasticity	1.4e+06*** (0.000)	-	4.0e+06*** (0.000)	1.9e+05*** (0.000)	7.4e+06*** (0.000)	20780.02*** (0.000)
Serial Correlation	7.67*** (0.006)	1.44 (0.233)	2.07 (0.152)	2.02 (0.158)	1.75 (0.187)	0.43 (0.512)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.7.2 Small Cap Index vs Top 100 Index

Table 4.12 (on page 126) shows the regression results between dividend and various proxies of future firm performance among dividend paying firms listed under the FTSE Bursa Malaysia Small Cap Index for a sample of 6200 observations. Rejection of the null hypotheses for both the Breusch-Pagan LM test and the Hausman test at 1% significance level conclude that the most appropriate model for the sample data is the fixed effect model. No multicollinearity problem exists in the model, but heteroskedasticity problem is found. Hence, the final model is rectified with robust standard error. Meanwhile, the F-statistics prove the overall significance for all the models at their respective R-squared, which indicate greater goodness-of-fit for the dependent variables of future earnings per share and future earnings yield at 3.66% and 5.87%, respectively, in comparison to other proxies of future firm performance.

The results for all the final models show that the independent variable of dividend ratio is insignificantly related to all proxies of future firm performance as represented by future earnings per share, future earnings yield, future return on assets, future return on equity, future operating income and future operating cash flow. The information content hypothesis for dividends is not supported in this case due to the insignificant relationship obtained. As for the control variables, cash holdings show a significant and positive association with all the proxies of future firm performance, except for future operating cash flow, which shows a significant and negative relationship. Meanwhile, the current ratio has a negative relationship with future earnings per share, future return on assets, future return on equity and future operating income. Thus, dividend paying firms with higher cash holdings but lower liquidity tend to yield higher earnings per share, return on assets, return on equity and operating income in the year following a dividend payout. In short, dividend

paying firms with a lower market capitalization, as listed under the FTSE Bursa Malaysia Small Cap Index, do not reveal any predictive power towards future firm performance, which is similar to the results from the main analysis.

Table 4.13 (on page 128) shows the regression results between dividend and various proxies of future firm performance among dividend paying firms listed under the FTSE Bursa Malaysia Top 100 Index for a sample of 900 observations. Rejection of the null hypotheses for both the Breusch-Pagan LM test and Hausman test at the 1% significance level conclude that the most appropriate model for the sample data is the fixed effect model. No multicollinearity problem is found in the model, but heteroskedasticity and serial correlation problem are detected. Hence, the fixed effect model with only heteroskedasticity problem is rectified with robust standard error. Meanwhile, the fixed effect model with both serial correlation and heteroskedasticity problems are corrected with cluster standard error. The F-statistics prove the overall significance of all the models at their respective R-squared, which indicate relatively stronger goodness-of-fit for the dependent variables of future return on assets, future return on equity and future operating income at 70.91%, 78.73% and 77.34%, respectively.

The result for the final model shows that the independent variable of dividend ratio is positively and significantly related to the dependent variables of future earnings per share, future return on assets, future return on equity, future operating income and future operating cash flow, all at a 1% significance level. For a one unit change in the dividend ratio, future earnings per share will increase by 0.8676 units. For a one unit change in the dividend ratio, future return on assets will increase by 0.4914 units. For a one unit change in the dividend ratio, future return on equity will increase by 0.7600 units. For a one unit change in the

dividend ratio, future operating income will increase by 0.6421 units. For a one unit change in the dividend ratio, future operating cash flow will increase by 0.6400 units. When comparing the magnitudes of the coefficients, it shows that the dividend ratio has a stronger relative effect on future earnings per share and future return on equity than other proxies of future firm performance.

The positive and significant relationship obtained among large capitalization dividend paying firms thus validates the information content hypothesis for dividends. Meanwhile, only a few control variables, such as firm size, leverage and growth opportunity, show a significant relationship to future firm performance among large capitalization dividend paying firms. In short, the result from Table 4.13 is different from the main analysis. While the results from the main analysis do not reveal any significant effect, significant results are indeed obtained among dividend paying firms with a large market capitalization. The dividend ratio is positively related to future earnings per share, future return on assets, future return on equity, future operating income and future operating cash flow among firms listed under the FTSE Bursa Malaysia Top 100 Index. The positive and significant relationship implies that the higher the dividend payment, the higher the earnings per share, return on assets, return on equity, operating income and operating cash flow that will be generated in the following year. Such a result is in line with the information content hypothesis for dividends, and in this case, it is only true among dividend paying firms with large market capitalization. Large cap firms are considered to be more mature, with less need for funds to finance investment opportunities than small firms, and hence more dividends can be distributed back to shareholders.

Table 4.12: Regression Results between Dividend and Future Firm Performance under FTSE Bursa Malaysia Small Cap Index

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.1388 [-0.97] (0.334)	0.0165 [0.41] (0.681)	0.0324 [0.65] (0.518)	0.0652 [1.16] (0.249)	0.0853 [1.30] (0.194)	0.0342*** [4.27] (0.000)
Dividend ratio	0.0652 [0.54] (0.588)	0.0082 [0.22] (0.828)	-0.0273 [-0.78] (0.435)	0.0092 [0.12] (0.903)	0.0284 [0.73] (0.469)	0.0384 [1.15] (0.251)
Total assets	0.0055 [0.60] (0.552)	0.0037 [1.46] (0.145)	-0.0025 [-0.76] (0.448)	-0.0048 [-1.39] (0.166)	-0.0040 [-0.94] (0.346)	0.0008* [1.91] (0.057)
Cash holdings	0.3205*** [2.88] (0.004)	0.1205* [1.81] (0.072)	0.1431*** [3.05] (0.002)	0.2729*** [3.45] (0.001)	0.0700*** [3.20] (0.002)	-0.0619*** [-3.31] (0.001)
Leverage ratio	-0.0040 [-1.38] (0.169)	-0.0004 [-0.54] (0.593)	-0.0013 [-1.41] (0.161)	-0.0038** [-1.99] (0.047)	-0.0005 [-1.39] (0.167)	0.0001 [1.21] (0.228)
Market-to-book ratio	0.0003 [1.30] (0.196)	0.0001 [0.52] (0.605)	0.0001 [1.38] (0.168)	0.0002* [1.67] (0.096)	0.0001 [1.15] (0.252)	0.0001 [0.13] (0.900)

Table 4.12 continued

Current ratio	-0.0014** [-2.12] (0.034)	0.0003 [0.63] (0.530)	-0.0007* [-1.75] (0.081)	-0.0020* [-1.67] (0.096)	-0.0006*** [-2.68] (0.008)	0.0001 [0.26] (0.796)
Observations	6200	6200	6200	6200	6200	6200
R-squared	0.0366	0.0587	0.0153	0.0123	0.0146	0.0035
F-statistics	5.60*** (0.000)	6.94*** (0.000)	6.85*** (0.000)	7.31*** (0.000)	4.87*** (0.000)	4.65*** (0.000)
Breusch-Pagan LM Test	465.60*** (0.000)	63.39*** (0.000)	49.21*** (0.000)	12.17*** (0.000)	304.35*** (0.000)	2150.41*** (0.000)
Hausman Test	63.45*** (0.000)	35.58*** (0.000)	168.78*** (0.000)	34.86*** (0.000)	166.56*** (0.000)	232.95*** (0.000)
Multicollinearity	1.08	1.08	1.08	1.08	1.08	1.08
Heteroskedasticity	4.1e+07*** (0.000)	4.3e+06*** (0.000)	1.1e+07*** (0.000)	7.4e+07*** (0.000)	4.2e+06*** (0.000)	71664.63*** (0.000)
Serial Correlation	1.69 (0.194)	2.09 (0.149)	0.00 (0.990)	0.06 (0.805)	1.28 (0.260)	0.10 (0.752)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.13: Regression Results between Dividend and Future Firm Performance under FTSE Bursa Malaysia Top 100 Index

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.0057 [-0.09] (0.927)	0.0989** [2.53] (0.015)	0.0326* [1.84] (0.073)	0.0586* [2.00] (0.052)	0.0399** [2.61] (0.012)	0.0702*** [3.10] (0.003)
Dividend ratio	0.8676*** [4.29] (0.000)	-0.0700 [-1.19] (0.242)	0.4914*** [7.18] (0.000)	0.7600*** [2.72] (0.009)	0.6421*** [7.44] (0.000)	0.6400*** [6.87] (0.000)
Total assets	0.0094*** [3.29] (0.002)	0.0005 [0.46] (0.649)	0.0002 [0.27] (0.790)	-0.0009 [-0.57] (0.572)	0.0008 [1.08] (0.284)	0.0003 [0.33] (0.740)
Cash holdings	0.2914 [1.59] (0.120)	0.0746 [1.44] (0.157)	-0.0026 [-0.05] (0.963)	0.0365 [0.30] (0.766)	0.0082 [0.14] (0.893)	-0.1048* [-1.75] (0.088)
Leverage ratio	0.0053 [1.20] (0.235)	-0.0005 [-0.53] (0.601)	0.0013 [1.53] (0.133)	0.0149 [1.61] (0.115)	-0.0006*** [-2.86] (0.007)	0.0023 [1.54] (0.131)
Market-to-book ratio	0.0039 [0.67] (0.505)	0.0005 [1.28] (0.208)	0.0007 [1.44] (0.158)	0.0230*** [10.77] (0.000)	0.0010 [1.55] (0.129)	-0.0008 [-1.15] (0.258)

Table 4.13 continued

Current ratio	0.0118 [1.12] (0.271)	0.0023 [0.65] (0.520)	0.0040 [0.94] (0.353)	0.0020 [0.27] (0.792)	-0.0015 [-0.52] (0.607)	0.0007 [0.23] (0.816)
Observations	900	900	900	900	900	900
R-squared	0.3141	0.0990	0.7091	0.7873	0.7734	0.5430
F-statistics	11.57*** (0.000)	8.37*** (0.000)	29.84*** (0.000)	83.09*** (0.000)	38.96*** (0.000)	18.56*** (0.000)
Breusch-Pagan LM Test	1704.66*** (0.000)	40.94*** (0.000)	93.33*** (0.000)	14.79*** (0.000)	319.74*** (0.000)	362.26*** (0.000)
Hausman Test	50.80*** (0.000)	19.00*** (0.004)	60.51*** (0.000)	26.15*** (0.000)	73.84*** (0.000)	45.06*** (0.000)
Multicollinearity	1.54	1.54	1.54	1.54	1.54	1.54
Heteroskedasticity	1.3e+06*** (0.000)	1.4e+05*** (0.000)	8143.42*** (0.000)	1.1e+05*** (0.000)	6979.23*** (0.000)	10345.53*** (0.000)
Serial Correlation	46.53*** (0.000)	2.47 (0.123)	11.65*** (0.001)	7.87*** (0.007)	30.90*** (0.000)	1.26 (0.267)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.14 (on page 134) displays the regression results between share repurchase and various proxies of future firm performance among share repurchasing firms listed under the FTSE Bursa Malaysia Small Cap Index for a sample of 2620 observations. The result shows that the most suitable model for the dependent variables of future earnings per share, future return on equity and future operating cash flow would be the fixed effect model. On the other hand, the most appropriate model for the dependent variables of future earnings yield, future return on assets and future operating income would be the random effect model. The existence of both heteroskedasticity and serial correlation problem is rectified with cluster standard error, while robust standard error is used to rectify the heteroskedasticity problem. The F-statistics prove the overall significance of all the models. The R-squared values of 4.51% and 5.92% for the respective future earnings per share and future return on equity reveal relatively stronger goodness-of-fit than other proxies of future firm performance.

The result from the final model shows that the explanatory variable of share repurchase ratio is positively related to all the dependent variables of future firm performance at their respective significance levels. The share repurchase ratio is positively related to future return on assets and future return on equity, all at a 1% significance level. Meanwhile, the share repurchase ratio is positively related to future earnings per share, future earnings yield, future operating income and future operating income at a 5% significance level. For a one unit change in the share repurchase ratio, future earnings per share will increase by 1.3529 units. For a one unit change in the share repurchase ratio, future earnings yield will increase by 1.0850 units. For a one unit change in the share repurchase ratio, future return on assets will increase by 1.0542 units. For a one unit change in the share repurchase ratio, future return on equity will increase by 0.9951 units. For a one unit change in the share

repurchase ratio, future operating income will increase by 0.8566 units. For a one unit change in the share repurchase ratio, future operating cash flow will increase by 0.5330 units. When comparing the magnitudes of the coefficients, it shows that the share repurchase ratio has a stronger relative effect on future earnings per share, future earnings yield and future return on assets in comparison to other proxies of future firm performance.

The positive and significant relationship thus supports the information signaling hypothesis for share repurchases. As for the control variables, cash holdings are significantly and positively related to most of the proxies of future firm performance, except for future operating cash flow. Meanwhile, the current ratio is negatively and significantly associated with future return on equity, future operating income and future operating cash flow. Hence, share repurchasing firms with larger cash holdings but lower liquidity tend to yield a higher return on equity and operating income in the first year after a share buyback. In short, share repurchasing firms with a small market capitalization, as listed under the FTSE Bursa Malaysia Small Cap Index, have a high predictive power for future firm performance. The results in Table 4.14 are consistent with the results from the main analysis, which also show a positive and significant association between share repurchase and all the proxies of future firm performance.

Table 4.15 (on page 136) presents the regression results between share repurchase and various proxies of future firm performance among share repurchasing firms listed under the FTSE Bursa Malaysia Top 100 Index for a sample of 440 observations. The result shows that the most appropriate model for the dependent variables of future earnings yield, future return on assets and future return on equity would be the fixed effect model. Meanwhile, the most suitable model for the dependent variables of future earnings per share, future operating

income and future operating cash flow would be the random effect model. The existence of both heteroskedasticity and serial correlation problem is rectified with cluster standard error. The F-statistics prove the overall significance of all the models. The R-squared values of 42.21%, 50.74% and 56.87% for the respective future return on assets, future operating income and future return on equity reveal relatively stronger goodness-of-fit than other proxies of future firm performance.

The results for the final model show that the explanatory variable of share repurchase ratio is only positively related to the dependent variables of future operating income at a 1% significance level. For a one unit change in the share repurchase ratio, future operating income will increase by 0.6897 units. Meanwhile, no significant association is revealed among other proxies of future firm performance, which include earnings per share, earnings yield, return on assets, return on equity and operating cash flow measured in the following year after a share buyback. As for the control variables, the leverage ratio is positively and significantly related to future earnings per share, future return on assets, future return on equity and future operating cash flow. Besides, the market-to-book ratio also shows a positive and significant relationship with most of the proxies for future firm performance except for future earnings yield. Moreover, the current ratio is positively and significantly related to future earnings per share, future return on assets, future operating income and future operating cash flow. Hence, share repurchasing firms with a higher leverage ratio, greater growth opportunity and higher liquidity tend to generate higher earnings per share, return on assets and operating cash flow in the first year after a share buyback. In short, the result from Table 4.15 shows that share repurchasing firms with large market capitalization as listed under the FTSE Bursa Malaysia Top 100 Index tend to reveal significant predictive

power towards future operating income only, which is quite different from the results of the main analysis, which show significance towards all proxies of future firm performance.

Overall, it is found that the predictive power of share repurchase towards future firm performance is more apparent among share repurchasing firms with small market capitalization. The results show that the share repurchase ratio is positively and significantly related to all proxies of future firm performance for share repurchasing firms listed under the FTSE Bursa Malaysia Small Cap Index. This indicates that higher degree of information asymmetry appear among low cap share repurchasing firms, and hence reveal more active engagement in share buyback activities to reveal private information about firm prospects.

On the other hand, the predictive ability of dividends towards future firm performance has only been proven among dividend paying firms with a large market capitalization. The results show that dividend paying firms as listed under the FTSE Bursa Malaysia Top 100 Index tend to generate higher earnings per share, return on assets, return on equity, operating income and operating cash flow in the following year of dividend payout.

In summary, the predictive ability of dividend towards future firm performance is shown apparently among dividend paying firms with large market capitalization, whereas the predictive power of share repurchase towards future firm performance is shown evidently among share repurchasing firms with small market capitalization.

Table 4.14: Regression Results between Share Repurchase and Future Firm Performance under FTSE Bursa Malaysia Small Cap Index

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.0055 [-0.18] (0.861)	-0.0131 [-0.32] (0.748)	0.1036 [0.74] (0.462)	-0.0051 [-0.28] (0.780)	0.2096 [1.13] (0.257)	0.0375*** [3.24] (0.002)
Share repurchase ratio	1.3529** [2.16] (0.032)	1.0850** [2.54] (0.011)	1.0542*** [3.72] (0.000)	0.9951*** [3.02] (0.003)	0.8566** [2.41] (0.016)	0.5330** [2.06] (0.042)
Total assets	0.0007 [0.42] (0.673)	0.0038* [1.76] (0.078)	-0.0045 [-0.64] (0.520)	0.0003 [0.25] (0.800)	-0.0090 [-0.98] (0.326)	0.0017*** [2.86] (0.005)
Cash holdings	0.1156* [1.70] (0.091)	0.0570* [1.72] (0.086)	0.1269*** [2.82] (0.005)	0.1402*** [2.77] (0.006)	0.1167*** [2.60] (0.009)	-0.0470* [-1.96] (0.052)
Leverage ratio	-0.0001 [-0.02] (0.981)	-0.0002 [-0.79] (0.427)	-0.0003 [-1.40] (0.160)	0.0001 [0.01] (0.992)	0.0001 [0.36] (0.715)	0.0004 [1.05] (0.294)
Market-to-book ratio	0.0001** [2.33] (0.021)	0.0001*** [3.78] (0.000)	0.0001 [0.86] (0.388)	0.0001*** [3.10] (0.002)	0.0001 [0.06] (0.954)	-0.0001* [-1.89] (0.061)

Table 4.14 continued

Current ratio	-0.0004 [-0.77] (0.440)	0.0003 [0.66] (0.511)	-0.0006 [-1.24] (0.216)	-0.0011*** [-3.04] (0.003)	-0.0021*** [-3.68] (0.000)	-0.0014*** [-4.77] (0.000)
Observations	2620	2620	2620	2620	2620	2620
R-squared	0.0451	0.0074	0.0143	0.0592	0.0172	0.0104
F-statistics	4.41*** (0.000)	25.34*** (0.000)	52.56*** (0.000)	13.14*** (0.000)	30.31*** (0.000)	7.40*** (0.000)
Breusch-Pagan LM Test	2515.27*** (0.000)	12.11*** (0.000)	36.91*** (0.000)	307.95*** (0.000)	26.20*** (0.000)	936.56*** (0.000)
Hausman Test	26.18*** (0.000)	7.19 (0.304)	9.53 (0.146)	22.34*** (0.001)	9.13 (0.167)	76.45*** (0.000)
Multicollinearity	1.07	1.07	1.07	1.07	1.07	1.07
Heteroskedasticity	2.8e+05*** (0.000)	-	-	1.4e+05*** (0.000)	-	12911.59*** (0.000)
Serial Correlation	8.53*** (0.004)	1.33 (0.252)	2.00 (0.160)	2.54 (0.113)	1.72 (0.192)	1.27 (0.262)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.15: Regression Results between Share Repurchase and Future Firm Performance under FTSE Bursa Malaysia Top 100 Index

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.0373 [-0.38] (0.701)	0.0792** [2.23] (0.037)	0.0547** [2.66] (0.015)	0.0436 [1.00] (0.328)	0.1007*** [4.13] (0.000)	0.0983*** [2.85] (0.004)
Share repurchase ratio	-0.9871 [-0.91] (0.365)	0.0429 [0.17] (0.866)	0.1388 [0.47] (0.643)	-0.0242 [-0.05] (0.964)	0.6897*** [4.68] (0.000)	0.5663 [1.30] (0.193)
Total assets	0.0036 [0.69] (0.488)	-0.0013 [0.82] (0.419)	-0.0024** [-2.28] (0.033)	-0.0017 [-0.65] (0.524)	-0.0034*** [-2.70] (0.007)	-0.0023 [-1.46] (0.144)
Cash holdings	0.3186* [1.78] (0.075)	0.1727 [1.62] (0.121)	0.0106 [0.20] (0.844)	0.1146 [1.04] (0.310)	-0.0456 [-0.92] (0.359)	-0.1475* [-1.68] (0.094)
Leverage ratio	0.0022*** [2.80] (0.005)	-0.0011*** [-6.67] (0.000)	0.0007*** [4.16] (0.000)	0.0059*** [32.74] (0.000)	-0.0001 [-0.38] (0.700)	0.0039*** [12.72] (0.000)
Market-to-book ratio	0.0317** [2.04] (0.041)	-0.0067** [-2.56] (0.018)	0.0115*** [4.65] (0.000)	0.0343*** [4.25] (0.000)	0.0183*** [5.34] (0.000)	0.0144*** [4.39] (0.000)

Table 4.15 continued

Current ratio	0.0353** [2.59] (0.010)	-0.0016 [-0.31] (0.756)	0.0095*** [2.89] (0.009)	-0.0018 [-0.24] (0.812)	0.0129*** [2.69] (0.007)	0.0146** [2.27] (0.023)
Observations	440	440	440	440	440	440
R-squared	0.1035	0.0357	0.4221	0.5687	0.5074	0.2127
F-statistics	41.30*** (0.000)	30.65*** (0.000)	10.50*** (0.000)	464.47*** (0.000)	144.68*** (0.000)	2433.62*** (0.000)
Breusch-Pagan LM Test	935.12*** (0.000)	28.87*** (0.000)	70.29*** (0.000)	45.57*** (0.000)	207.92*** (0.000)	222.57*** (0.000)
Hausman Test	4.66 (0.588)	30.36*** (0.000)	19.68*** (0.003)	27.76*** (0.000)	9.89 (0.129)	4.31 (0.634)
Multicollinearity	1.33	1.33	1.33	1.33	1.33	1.33
Heteroskedasticity	-	4425.05*** (0.000)	432.28*** (0.000)	1949.05*** (0.000)	-	-
Serial Correlation	53.10*** (0.000)	6.90** (0.016)	8.80*** (0.007)	6.40** (0.020)	26.92*** (0.000)	0.26 (0.615)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.7.3 Top 25% vs Bottom 25% Payout Frequency

Table 4.16 (on page 141) shows the regression results between dividend and various proxies of future firm performance among dividend paying firms under the category of the top 25% payout frequency for a total of 1900 observations. The rejection of the null hypotheses for both the Breusch-Pagan LM test and the Hausman test at the 1% significance level proves that the most suitable model would be the fixed effect model. Multicollinearity does not occur as the mean VIF value of 1.65 is still less than 10. However, both heteroskedasticity and serial correlation problems exist that require rectification with cluster standard error. The F-statistics significantly prove the overall significance of all the models. The lowest R-squared value of 13.48% is recorded for the dependent variable of future earnings yield. Meanwhile, future return on equity and future operating income show higher R-squared values of 67.64% and 70.24%, respectively, as compared to other proxies of future firm performance.

The result for the final model shows that the explanatory variable of dividend ratio is positively related to future return on assets, future return on equity, future operating income and future operating cash flow at a 1% significance level, while the dividend ratio is positively associated with future earnings per share at a 5% significance level, which thus supports the information content hypothesis for dividends. For a one unit change in the dividend ratio, earnings per share tend to increase by 1.079 units in the first year after dividend payout. For a one unit change in the dividend ratio, future return on assets tend to increase by 0.4299 units. For a one unit change in the dividend ratio, return on equity tends to increase by 0.9157 units in the first year following dividend payout. For a one unit change in the dividend ratio, future operating income tends to increase by 0.5522 units. For a one unit change in the dividend ratio, future operating cash flow tends to increase by 0.4196

units. When comparing the magnitudes of the coefficients, it can be observed that the dividend ratio has a stronger effect on future earnings per share, followed by future return on equity, in comparison to other significant proxies of future firm performance.

Meanwhile, dividend paying firms among the top 25% payout frequency that are smaller in size and have lower liquidity but higher leverage tend to display a higher return on assets and return on equity in the following year of dividend payout. Smaller firms are regarded as being in the expansionary stage. In order to meet growth opportunities, they tend to increase capital through debt, which might lead to problems meeting excessive current liabilities and hence a negative current ratio. The results from Table 4.16, which show significant findings among dividend paying firms with a higher payout frequency, are different from the results of the main analysis, which show insignificant results.

Table 4.17 (on page 143) presents the regression results between dividend and various proxies of future firm performance among dividend paying firms under the category of the bottom 25% payout frequency for a total of 1920 observations. The F-statistics prove the overall significance of all the models despite the low R-squared values obtained below 5%. The results show that the independent variable of dividend ratio is only positively related to the dependent variable of future operating cash flow at a 5% significance level. Hence, a higher dividend payment is reflective of improved operating cash flow in the following year of the dividend payout, which is consistent with the information content hypothesis for dividends. As for the control variables, dividend paying firms among the bottom 25% of payout frequency that hold lower leverage but higher growth opportunities tend to portray higher earnings yield, return on assets and operating income in the future. The results from Table 4.17 reveal that dividend paying firms with a lower frequency of payout only possess

predictive power towards future operating cash flow which is different from the results of the main analysis, which do not show any significance.

After comparing Table 4.16 and Table 4.17, it shows that dividend paying firms with a higher payout frequency portray better information about future firm performance than dividend paying firms with a lower payout frequency. In short, improved performance of future earnings per share, future return on assets, future return on equity and future operating income are only reflected among dividend paying firms with the top 25% payout frequency, while future operating cash flow is predictable through dividends among both categories of payout frequency. Generally, the models in Table 4.16 reveal a stronger goodness-of-fit than the models in Table 4.17, thus indicating that the variation in future firm performance is better explained by the independent variable among the top 25% payout frequency. Such result implies that dividend paying firms tend to signify better firm performance in the near future by increasing their frequency of dividend payout. Therefore, payout frequency appears to be a crucial factor in influencing the extent of information content for dividends.

Table 4.16: Regression Results between Dividend and Future Firm Performance for Top 25% Payout Frequency

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.4425 [-0.64] (0.524)	0.1121 [0.79] (0.431)	0.3846*** [3.95] (0.000)	0.6152*** [2.80] (0.006)	0.2057* [1.71] (0.091)	0.3243* [1.81] (0.074)
Dividend ratio	1.0790* [1.76] (0.081)	-0.0114 [-0.31] (0.760)	0.4299*** [9.05] (0.000)	0.9157*** [3.59] (0.000)	0.5522*** [7.56] (0.000)	0.4196*** [6.05] (0.000)
Total assets	0.0248 [0.73] (0.468)	-0.0004 [-0.06] (0.954)	-0.0170*** [-3.51] (0.001)	-0.0279** [-2.54] (0.013)	-0.0077 [-1.30] (0.197)	-0.0121 [-1.38] (0.172)
Cash holdings	0.2997** [2.42] (0.018)	0.0361 [1.11] (0.269)	0.0498* [1.93] (0.057)	0.0461 [0.77] (0.445)	0.0290 [0.82] (0.413)	-0.0446 [-1.57] (0.121)
Leverage ratio	0.0005 [0.29] (0.775)	-0.0010*** [-3.87] (0.000)	0.0010** [2.59] (0.011)	0.0074*** [12.39] (0.000)	-0.0003 [-0.91] (0.363)	0.0037*** [4.87] (0.000)
Market-to-book ratio	0.0131 [1.23] (0.223)	-0.0001 [-0.07] (0.943)	0.0016* [1.75] (0.084)	0.0124*** [3.41] (0.001)	0.0026* [1.87] (0.065)	0.0018 [1.60] (0.113)

Table 4.16 continued

Current ratio	-0.0030 [-1.11] (0.272)	-0.0006 [-0.70] (0.489)	-0.0012** [-2.24] (0.027)	-0.0029*** [-3.04] (0.003)	-0.0014* [-1.88] (0.063)	-0.0007 [-1.27] (0.207)
Observations	1900	1900	1900	1900	1900	1900
R-squared	0.4488	0.1348	0.5602	0.6764	0.7024	0.4312
F-statistics	4.69*** (0.000)	9.56*** (0.000)	18.20*** (0.000)	35.27*** (0.000)	20.99*** (0.000)	10.42*** (0.000)
Breusch-Pagan LM Test	4255.43*** (0.000)	80.67*** (0.000)	233.93*** (0.000)	86.64*** (0.000)	599.69*** (0.000)	743.58*** (0.000)
Hausman Test	52.66*** (0.000)	34.29*** (0.000)	157.33*** (0.000)	124.97*** (0.000)	134.61*** (0.000)	56.18*** (0.000)
Multicollinearity	1.65	1.65	1.65	1.65	1.65	1.65
Heteroskedasticity	44838.10*** (0.000)	1.5e+05*** (0.000)	3951.29*** (0.000)	13524.20*** (0.000)	7458.97*** (0.000)	9929.07*** (0.000)
Serial Correlation	84.75*** (0.000)	3.64* (0.060)	41.68*** (0.000)	4.15** (0.045)	65.73*** (0.000)	7.56*** (0.007)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.17: Regression Results between Dividend and Future Firm Performance for Bottom 25% Payout Frequency

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.4112 [-1.15] (0.248)	0.0439*** [2.66] (0.009)	-0.0727* [-1.96] (0.053)	0.0337 [1.03] (0.303)	-0.0153 [-1.37] (0.174)	-0.0086 [-0.89] (0.377)
Dividend ratio	-0.3037 [-0.62] (0.538)	0.0291 [0.08] (0.940)	-0.0381 [-0.13] (0.894)	0.6577 [1.42] (0.158)	0.2934 [1.50] (0.137)	0.5352** [2.62] (0.010)
Total assets	0.0169 [0.92] (0.360)	-0.0001 [-0.09] (0.927)	0.0023 [1.23] (0.221)	-0.0075** [-2.52] (0.013)	-0.0005 [-0.78] (0.439)	0.0018*** [3.32] (0.001)
Cash holdings	0.3564* [1.94] (0.052)	0.2713 [1.34] (0.184)	0.1629 [1.51] (0.135)	0.3637** [2.07] (0.041)	0.0063 [0.15] (0.877)	-0.1580*** [-4.04] (0.000)
Leverage ratio	-0.0096*** [-3.83] (0.000)	-0.0016*** [-3.85] (0.000)	-0.0021*** [-4.74] (0.000)	-0.0043 [-0.89] (0.376)	-0.0014*** [-4.54] (0.000)	0.0002 [1.00] (0.319)
Market-to-book ratio	0.0209*** [3.64] (0.000)	0.0032*** [2.97] (0.004)	0.0047*** [4.59] (0.000)	0.0019 [0.17] (0.863)	0.0032*** [3.62] (0.000)	-0.0005 [-1.04] (0.303)

Table 4.17 continued

Current ratio	-0.0007 [-0.66] (0.509)	-0.0002 [-0.15] (0.877)	-0.0010 [-0.96] (0.342)	-0.0026 [-0.75] (0.454)	-0.0001 [-0.03] (0.979)	0.0010*** [4.10] (0.000)
Observations	1920	1920	1920	1920	1920	1920
R-squared	0.0244	0.0341	0.0096	0.0058	0.0346	0.0185
F-statistics	21.86*** (0.001)	5.77*** (0.000)	6.77*** (0.000)	4.26*** (0.001)	3.19*** (0.000)	5.66*** (0.000)
Breusch-Pagan LM Test	26.08*** (0.000)	25.51*** (0.000)	0.00 (1.000)	0.36 (0.276)	94.35*** (0.000)	88.55*** (0.000)
Hausman Test	6.51 (0.369)	217.35*** (0.000)	-	-	32.84*** (0.000)	39.71*** (0.000)
Multicollinearity	1.83	1.83	1.83	1.83	1.83	1.83
Heteroskedasticity	-	4.0e+05*** (0.000)	358.73*** (0.000)	1097.26*** (0.000)	90531.73*** (0.000)	12108.80*** (0.000)
Serial Correlation	0.90 (0.346)	0.22 (0.639)	-	-	4.15*** (0.044)	0.86 (0.356)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.18 (on page 147) displays the regression results between share repurchase and various proxies of future firm performance among share repurchasing firms under the category of the top 25% payout frequency for a total of 840 observations. Rejection of the null hypotheses for both the Breusch-Pagan LM test and the Hausman test proves that the most appropriate model would be the fixed effect model. Multicollinearity problems do not appear as the mean VIF of 1.26 is less than 10. However, both heteroskedasticity and serial correlation problems seem to exist in the model, which need rectification with cluster standard error. The F-statistics prove the overall significance of all the models, except for the dependent variable of future earnings yield. The R-squared value for future earnings per share is relatively lower at only 7.19%. Meanwhile, the R-squared values for future return on assets, future return on equity and future operating income are relatively higher at 44%, 58% and 48%, respectively.

The results from the final model show that the explanatory variable of share repurchase ratio is positively related to the dependent variables of future operating income and future operating cash flow at a 10% significance level, which thus validates the information signaling hypothesis for share repurchases. For a one unit change in the share repurchase ratio, future operating income tends to increase by 0.6373 units, while future operating cash flow tends to rise by 0.5728 units. The magnitude of the coefficients indicates that the effect of share repurchase on future operating performance is similar among the sample firms that buy back shares frequently. As for the control variables, share repurchasing firms under the category of the top 25% payout frequency that have greater growth opportunities tend to portray better operating income and operating cash flow in the following year of share buyback. Rising investment opportunities thus also indicate better operating performance in the future. The results from Table 4.18 reveal that share

repurchasing firms that have a higher frequency of payout possess predictive power towards certain proxies of future firm performance, which are quite similar to the results from the main analysis.

Table 4.19 (on page 149) shows the regression results between share repurchase and various proxies of future firm performance among share repurchasing firms under the category of the bottom 25% payout frequency for a total of 940 observations. The F-statistics prove the overall significance of all the models. However, the results show that the independent variable of share repurchase ratio is not significant for all proxies of future firm performance. This repudiates the information signaling hypothesis for share repurchases. As for the control variables, cash holdings and market-to-book ratio are found to be significant factors in influencing future firm performance among share repurchasing firms with a bottom 25% payout frequency. Hence, repurchasing firms with higher cash holdings and greater growth opportunities tend to signify a better earnings yield and return on equity in the following year of share buyback. The results from Table 4.19 indicate that share repurchasing firms with a lower frequency of payout do not possess any predictive power towards future firm performance, which is different from the results of the main analysis, which show significant findings.

After comparing Table 4.18 and Table 4.19, it is found that share repurchasing firms with a higher payout frequency obviously possess better predictive power towards future firm performance than share repurchasing firms with a lower payout frequency. Such finding implies that the frequency of payout exerts a certain degree of influence in affecting the information signaling of share repurchase.

Table 4.18: Regression Results between Share Repurchase and Future Firm Performance for Top 25% Payout Frequency

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.0697 [-0.79] (0.434)	0.0773*** [2.76] (0.006)	-0.0058 [-0.18] (0.859)	0.0190 [1.30] (0.201)	0.0428*** [6.23] (0.000)	0.0161 [1.38] (0.174)
Share repurchase ratio	0.8057 [0.99] (0.328)	0.9571** [2.11] (0.035)	0.4761 [1.66] (0.105)	0.5745 [1.18] (0.244)	0.6373* [1.88] (0.068)	0.5728* [1.74] (0.090)
Total assets	0.0041 [0.90] (0.373)	-0.0005 [-0.35] (0.726)	0.0013 [0.79] (0.434)	-0.0003 [-0.24] (0.811)	-0.0007 [-1.38] (0.176)	0.0019*** [2.76] (0.008)
Cash holdings	0.1893 [1.46] (0.151)	0.0945 [1.48] (0.138)	0.0431 [0.88] (0.383)	0.0380 [0.63] (0.530)	0.1097** [2.23] (0.031)	-0.0370 [-0.72] (0.477)
Leverage ratio	0.0193 [0.90] (0.371)	0.0007 [0.12] (0.908)	-0.0064 [-1.36] (0.182)	-0.0006 [-0.04] (0.968)	-0.0035 [-0.80] (0.428)	-0.0069 [-1.49] (0.143)
Market-to-book ratio	0.0111 [1.40] (0.168)	-0.0028 [-1.64] (0.100)	0.0140*** [10.38] (0.000)	0.0421*** [12.60] (0.000)	0.0172*** [8.64] (0.000)	0.0129*** [6.79] (0.000)

Table 4.18 continued

Current ratio	0.0031 [0.91] (0.366)	0.0001 [0.01] (0.989)	0.0014 [1.33] (0.190)	0.0003 [0.20] (0.842)	-0.0020 [-1.67] (0.103)	-0.0026** [-2.46] (0.018)
Observations	840	840	840	840	840	840
R-squared	0.0719	0.0086	0.4400	0.5845	0.4787	0.2065
F-statistics	2.90*** (0.001)	9.03 (0.172)	32.26*** (0.000)	62.65*** (0.000)	72.83*** (0.000)	24.88*** (0.000)
Breusch-Pagan LM Test	540.55*** (0.000)	27.79*** (0.000)	214.48*** (0.000)	119.24*** (0.000)	366.66*** (0.000)	270.10*** (0.000)
Hausman Test	22.18*** (0.001)	7.38 (0.287)	18.54*** (0.005)	39.99*** (0.000)	20.33*** (0.002)	20.90*** (0.002)
Multicollinearity	1.26	1.26	1.26	1.26	1.26	1.26
Heteroskedasticity	1.2e+05*** (0.000)	-	5626.58*** (0.000)	2325.19*** (0.000)	7099.54*** (0.000)	6652.64*** (0.000)
Serial Correlation	4.66** (0.037)	2.84* (0.099)	32.17*** (0.000)	14.08*** (0.001)	21.20*** (0.000)	9.08*** (0.004)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.19: Regression Results between Share Repurchase and Future Firm Performance for Bottom 25% Payout Frequency

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	0.0114 [0.30] (0.762)	0.0045 [0.12] (0.906)	-0.0248 [-0.79] (0.429)	-0.0089 [-0.49] (0.625)	0.0209* [1.88] (0.060)	0.0327 [1.44] (0.156)
Share repurchase ratio	0.3880 [0.35] (0.725)	-0.8627 [-1.44] (0.150)	0.0936 [0.27] (0.785)	0.2605 [0.46] (0.648)	0.0123 [0.03] (0.978)	0.6854 [1.05] (0.300)
Total assets	0.0039* [1.87] (0.068)	0.0029 [1.56] (0.119)	0.0024 [1.58] (0.115)	0.0018* [1.66] (0.097)	0.0012* [1.93] (0.054)	0.0025** [2.63] (0.012)
Cash holdings	0.1907 [1.10] (0.278)	0.0877* [1.88] (0.060)	0.0565 [1.34] (0.181)	0.1560* [1.84] (0.066)	-0.0001 [-0.00] (0.999)	-0.1109** [-2.04] (0.047)
Leverage ratio	0.0011 [1.24] (0.222)	-0.0002 [-0.79] (0.428)	-0.0001 [-0.19] (0.853)	0.0036 [1.47] (0.142)	0.0001 [0.31] (0.758)	0.0010 [1.34] (0.188)
Market-to-book ratio	0.0001 [0.87] (0.388)	0.0001*** [3.15] (0.002)	0.0001*** [4.55] (0.000)	0.0001** [2.55] (0.011)	0.0001*** [3.26] (0.001)	-0.0001* [-1.91] (0.063)

Table 4.19 continued

Current ratio	-0.0009 [-0.24] (0.814)	-0.0023 [-1.47] (0.141)	-0.0009 [-0.76] (0.446)	-0.0024 [-1.43] (0.152)	-0.0008 [-0.70] (0.482)	0.0012 [0.83] (0.409)
Observations	940	940	940	940	940	940
R-squared	0.0507	0.0088	0.0277	0.0360	0.0077	0.0252
F-statistics	2.85** (0.019)	31.57*** (0.000)	41.89*** (0.000)	171.07*** (0.000)	15.20** (0.019)	6.06*** (0.000)
Breusch-Pagan LM Test	1927.99*** (0.000)	14.83*** (0.000)	266.26*** (0.000)	162.44*** (0.000)	731.75*** (0.000)	279.81*** (0.000)
Hausman Test	12.25** (0.032)	3.85 (0.571)	4.84 (0.436)	8.83 (0.116)	5.35 (0.374)	18.38*** (0.003)
Multicollinearity	1.21	1.21	1.21	1.21	1.21	1.21
Heteroskedasticity	1.0e+05*** (0.000)	-	-	-	-	12291.20*** (0.000)
Serial Correlation	0.87 (0.357)	2.00 (0.164)	3.94* (0.053)	2.65 (0.110)	11.26*** (0.002)	0.075 (0.786)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.7.4 Dividend Payout Ratio vs Buyback Ratio

Table 4.20 (on page 153) shows the regression results between dividend and various proxies of future firm performance for a total of 7100 observations by employing the dividend payout ratio as an alternative proxy for the explanatory variable. Rejection of the null hypotheses for both the Breusch-Pagan LM test and the Hausman test at the 1% significance level suggests that the most appropriate model would be the fixed effect model. Multicollinearity problems do not occur in the data, but heteroskedasticity problems exist. The fixed effect model is thus rectified with robust standard error. The F-statistics prove the overall significance of all the models. However, the results show that the dividend payout ratio is not significant towards any of the proxies for future firm performance. Hence, the information content hypothesis for dividends is not supported. As for the control variables, dividend paying firms with higher cash holdings but lower liquidity tend to have higher earnings per share, return on assets and operating income in the year following dividend payout. Table 4.20 does not show any significant findings, even though the dividend payout ratio is used as an alternative proxy for the explanatory variable. Such finding is similar to the results from the main analysis, which enhances the robustness of the results.

Table 4.21 (on page 155) displays the regression results between share repurchase and various proxies of future firm performance for a total of 3060 observations with the utilization of the buyback ratio as an alternative proxy for the explanatory variable. The rejection of the null hypotheses for both the Breusch-Pagan LM test and the Hausman test suggests that the fixed effect model will be more appropriate. Although multicollinearity problems do not occur in the data, heteroskedasticity and serial correlation problems seem to exist in the models. Meanwhile, the overall significance of all the models is proven by the F-statistics.

The results from the final model show that the buyback ratio is positively related to future earnings per share, future return on assets and future return on equity at a 1% significance level, while it is positively related to future operating income and future operating cash flow at a 5% significance level, which is consistent with the information signaling hypothesis for share repurchases. For a one unit change in the buyback ratio, future earnings per share tend to increase by 0.4042 units, future return on assets tends to increase by 0.1741 units, future return on equity tends to increase by 0.3139 units, and future operating income increases by 0.1829 units while future operating cash flow increases by 0.1226 units. When comparing the magnitudes of the coefficients, it appears that the proxy of the buyback ratio exerts a stronger effect on future earnings per share and future return on equity as compared to the rest of the proxies for future firm performance.

As for the control variables, repurchasing firms that hold higher cash holdings but with lower liquidity tend to generate a higher return on equity in the following year of share buyback. Even though the buyback ratio is used as an alternative proxy for the explanatory variable in the panel data analysis, the results from Table 4.21 are still similar to the main analysis, which shows a positive and significant association between share repurchase and future firm performance and hence enhances the robustness of the results.

Table 4.20: Regression Results between Dividend and Future Firm Performance with Proxy of Dividend Payout Ratio

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	-0.1100 [-0.82] (0.411)	0.0193 [0.51] (0.612)	0.0367 [0.78] (0.436)	0.0793 [1.49] (0.137)	0.0876 [1.42] (0.158)	0.0419*** [5.48] (0.000)
Dividend payout ratio	-0.0004 [-0.92] (0.359)	0.0003 [0.68] (0.497)	-0.0001 [-0.84] (0.404)	-0.0001 [-0.33] (0.744)	0.0001 [0.26] (0.792)	-0.0001 [-0.62] (0.539)
Total assets	0.0053 [0.63] (0.527)	0.0036 [1.58] (0.115)	-0.0022 [-0.74] (0.462)	-0.0040 [-1.27] (0.205)	-0.0036 [-0.94] (0.347)	0.0007* [1.75] (0.081)
Cash holdings	0.3134*** [3.05] (0.002)	0.1211** [1.99] (0.047)	0.1301*** [3.02] (0.003)	0.2412*** [3.21] (0.001)	0.0663*** [3.06] (0.002)	-0.0630*** [-3.39] (0.001)
Leverage ratio	-0.0037 [-1.33] (0.184)	-0.0004 [-0.55] (0.585)	-0.0013 [-1.36] (0.173)	-0.0033* [-1.87] (0.062)	-0.0005 [-1.43] (0.154)	0.0001 [1.12] (0.262)
Market-to-book ratio	0.0003 [1.26] (0.209)	0.0001 [0.63] (0.526)	0.0001 [1.28] (0.201)	0.0004 [1.04] (0.299)	0.0001 [1.07] (0.285)	0.0001 [0.82] (0.413)

Table 4.20 continued

Current ratio	-0.0013** [-2.14] (0.033)	0.0003 [0.59] (0.554)	-0.0006* [-1.69] (0.092)	-0.0019 [-1.61] (0.109)	-0.0006*** [-2.67] (0.008)	0.0001 [0.31] (0.760)
Observations	7100	7100	7100	7100	7100	7100
R-squared	0.0350	0.0556	0.0148	0.0104	0.0091	0.0016
F-statistics	6.15*** (0.000)	6.94*** (0.000)	6.03*** (0.000)	5.08*** (0.000)	5.20*** (0.000)	4.96*** (0.000)
Breusch-Pagan LM Test	2159.24*** (0.000)	77.22*** (0.000)	192.43*** (0.000)	114.70*** (0.000)	1276.58*** (0.000)	6739.32*** (0.000)
Hausman Test	79.08*** (0.000)	39.95*** (0.000)	70.27*** (0.000)	54.15*** (0.000)	197.46*** (0.000)	157.15*** (0.000)
Multicollinearity	1.07	1.07	1.07	1.07	1.07	1.07
Heteroskedasticity	8.4e+07*** (0.000)	1.8e+07*** (0.000)	1.3e+07*** (0.000)	8.4e+07*** (0.000)	4.8e+06*** (0.000)	96455.10*** (0.000)
Serial Correlation	1.77 (0.185)	2.17 (0.141)	0.42 (0.516)	0.02 (0.877)	1.32 (0.252)	0.31 (0.578)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

Table 4.21: Regression Results between Share Repurchase and Future Firm Performance with Proxy of Buyback Ratio

	Earnings per Share (t+1)	Earnings Yield (t+1)	Return on Assets (t+1)	Return on Equity (t+1)	Operating Income (t+1)	Operating Cash Flow (t+1)
Constant	0.0051 [0.17] (0.865)	0.0053 [0.13] (0.896)	0.1215 [0.86] (0.391)	0.0030 [0.17] (0.861)	0.2281 [1.22] (0.225)	0.0462*** [4.26] (0.000)
Buyback ratio	0.4042*** [3.85] (0.000)	0.1590 [1.31] (0.193)	0.1741*** [2.66] (0.009)	0.3139*** [4.80] (0.000)	0.1829** [2.13] (0.034)	0.1226** [2.34] (0.021)
Total assets	0.0003 [0.21] (0.836)	0.0050** [2.10] (0.037)	-0.0049 [-0.69] (0.492)	0.0003 [0.26] (0.793)	-0.0094 [-0.98] (0.328)	0.0013** [2.41] (0.017)
Cash holdings	0.1541** [2.26] (0.025)	0.0626 [1.32] (0.189)	0.1063*** [2.85] (0.005)	0.1534*** [3.16] (0.002)	0.0870** [2.14] (0.034)	-0.0403* [-1.73] (0.086)
Leverage ratio	0.0003 [0.29] (0.775)	-0.0003 [-1.14] (0.255)	0.0001 [0.38] (0.701)	0.0009 [0.36] (0.723)	0.0003 [1.19] (0.234)	0.0009 [1.45] (0.148)
Market-to-book ratio	0.0001** [2.37] (0.019)	-0.0001 [-0.53] (0.596)	0.0001 [0.40] (0.691)	0.0001*** [3.05] (0.003)	-0.0001 [-0.48] (0.629)	-0.0001 [-1.21] (0.230)

Table 4.21 continued

Current ratio	-0.0006 [-1.07] (0.285)	0.0005 [1.48] (0.140)	-0.0004 [-1.14] (0.258)	-0.0012*** [-2.97] (0.004)	-0.0017*** [-5.12] (0.000)	-0.0014*** [-4.41] (0.000)
Observations	3060	3060	3060	3060	3060	3060
R-squared	0.0451	0.1054	0.0096	0.0588	0.0116	0.0151
F-statistics	6.08*** (0.000)	11.85*** (0.000)	4.06*** (0.001)	12.05*** (0.000)	5.72*** (0.000)	7.18*** (0.000)
Breusch-Pagan LM Test	3776.23*** (0.000)	19.49*** (0.000)	74.32*** (0.000)	825.11*** (0.000)	59.85*** (0.000)	1647.89*** (0.000)
Hausman Test	45.30*** (0.000)	19.93*** (0.003)	16.97*** (0.009)	25.12*** (0.000)	19.55*** (0.003)	73.88*** (0.000)
Multicollinearity	1.06	1.06	1.06	1.06	1.06	1.06
Heteroskedasticity	3.0e+06*** (0.000)	4.0e+05*** (0.000)	3.9e+06*** (0.000)	1.5e+05*** (0.000)	8.0e+06*** (0.000)	20191.83*** (0.000)
Serial Correlation	11.00*** (0.001)	1.42 (0.235)	1.98 (0.162)	2.96* (0.087)	1.63 (0.203)	0.93 (0.336)

Note: Figures in the square brackets and parentheses represent t-statistics and p-values respectively, while *, ** and *** indicate the respective 10%, 5% and 1% significance levels.

4.8 Chapter Summary

In short, the investigation of the relationship between corporate payout policy and future firm performance yields different results after conducting several panel regression analyses for a total sample of 355 dividend payers, 153 share repurchasers and also 144 mutual payers within the sample period of 2000 to 2020. As a result, total payout ratio is only found to be significantly and positively related to future return on assets and future operating income among mutual payers. Such result indicates that even with the combination of both payout policy, total payout also contains information about the firm's prospect as reflected in their future financial and operating performance, thus supporting the information content hypothesis.

Meanwhile, results from the main analysis have revealed a positive and significant relationship among share repurchase towards all proxies of future firm performance as denoted by earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow measured in the following year of share buyback. The positive relationship indicates that the higher the share repurchase ratio, the better the firm's performance in the future. These findings corroborate with the information signaling hypothesis for share repurchases, which states that firms tend to buy back shares to signal investors about their optimistic view of the firm's prospects. In this case, it is found that share repurchasing firms in Malaysia tend to signal improvements in their future earnings per share, future earnings yield, future return on assets, future return on equity, future operating income and future operating cash flow through share buyback.

These results are still robust even after replacing the independent variable of share repurchase ratio with an alternative proxy of buyback ratio. After excluding the crisis period,

it is found that the share repurchase ratio is positively and significantly related to most of the proxies for future firm performance, except for future earnings yield. Besides, the predictive power of share repurchase towards future firm performance tends to be spotted among small cap repurchasing firms as listed under the FTSE Bursa Malaysia Small Cap Index apart from those that frequently buy back shares as categorized under the top 25% payout frequency.

On the other hand, the insignificant relationship between dividends and all proxies of future firm performance as shown from the main analysis does not support the information content hypothesis for dividends. The same findings are still obtained even after excluding the crisis period and with the employment of an alternative proxy of dividend payout ratio to replace the independent variable of dividend ratio. However, there is a positive and significant relationship between the dividend ratio and future earnings per share, future return on assets, future return on equity, future operating income and future operating cash flow among large cap dividend paying firms as listed under the FTSE Bursa Malaysia Top 100 Index. Moreover, significant results are also obtained among dividend paying firms that frequently pay dividends as categorized under the category of top 25% payout frequency.

CHAPTER 5

CONCLUSION

5.1 Conclusions

The first objective of the study is to examine the relationship between dividends and future firm performance. As a result, an insignificant relationship is found between dividend and various proxies of future firm performance as represented by earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow measured in the first year subsequent to dividend payout. The same finding with the main analysis is obtained even after excluding the sample data from the financial crisis period and by employing alternative proxy for the explanatory variable. These results show that dividends do not have any impact on future firm performance, and hence rejected the information content hypothesis. However, robustness checking through sensitivity tests reveal significant impact of dividends towards future firm performance among dividend paying firms that frequently pay dividends and those listed on the FTSE Bursa Malaysia Top 100 Index. Hence, the information content hypothesis is still verified among dividend paying firms with large capitalization and higher payout frequency. Overall, it can be deducted that most Malaysian listed firms do not take into account future earnings of firms as major consideration when structuring their dividend policy, except for small group of firms with specific characteristics.

This result is somehow similar to the study by Zhou and Ruland (2006) who found a strong, positive association between current dividend payout and future earnings growth in U.S., whereby such positive relationship is more prominent for companies with limited growth opportunities. In conjunction with this, dividend paying firms listed on the FTSE

Bursa Malaysia Top 100 Index are also deemed to be stable firms with large market capitalization. As firms become more mature, their investment opportunity set becomes smaller. Therefore, more earnings of the firm can be channelled towards dividend payout to serve as a prospective signaling device. On the other hand, the result on the predictive power of dividend from the current study contrasts with the study by Al-Shattarat et al. (2018) who presented a strong relationship between dividend and return on assets in the subsequent year of dividend announcements among Jordanian firms. Such inconsistency of result might be driven by the variation in the methodologies, in which a combination of event study methodology together with the two stage least square model had been applied in the study by Al-Shattarat et al. (2018).

The second objective of the study is to investigate the relationship between share repurchase and future firm performance. As a result, a significant relationship is found. Share repurchase is positively related to all the proxies of future firm performance as represented by earnings per share, earnings yield, return on assets, return on equity, operating income and operating cash flow measured in the first year right after share buyback. The robustness of this result is further enhanced when the sensitivity test with exclusion of crisis period and alternative proxy for independent variable yield the similar result with the main analysis. In addition, the impact of share repurchase towards future firm performance is particularly pronounced among share repurchasing firms listed on the FTSE Bursa Malaysia Small Cap Index and those that relatively buy back shares more frequently. All these findings verify the information signaling hypothesis and prove that Malaysian firms portray signal on firm prospect through share repurchase.

This result is similar to the study by Evans and Evans (2001) who found significant improvement in the accounting performance of U.S. repurchasing firms, which is also measured by return on assets, return on equity and earnings per share, in the period immediately following the initiation of a share repurchase program. Besides, this result is also consistent with the study by Giambona et al. (2006) who found evidence that the size of a repurchase program in U.S. is positively related to future operating performance measured at the year following the announcement. However, the result on predictive power of share repurchase from the current study is inconsistent with the study by Grullon and Michaely (2004) and Huang et al. (2010) who realized that the announcements of open market share repurchase programs are not followed by an increase in operating performance. As compared to U.S., the share buyback announcement in Bursa Malaysia indicates the actual share repurchase, whereas U.S. firms are given three years to complete an announced repurchase. Therefore, the examination of share repurchase announcement instead of actual repurchase by Grullon and Michaely (2004) may be the possible factor that cause such inconsistency. This rationale is further justified by Lie (2005) who revealed that the operating performance improvement following the share repurchase is limited to firms that actually repurchase shares during the same fiscal quarter.

The third objective of the study is to assess the relationship between total payout and future firm performance. As a result, total payout only shows a significant and positive relationship with certain proxies of future firm performance as indicated by return on assets and operating income measured in the following year of payout. The information content hypothesis is thus validated. This shows that mutual payers which involved in both dividend payment and share repurchase tend to use corporate payout policy as a signaling mechanism

to inform investors on better prospect of the firms in terms of financial and operating performance.

In conclusion, the information content of corporate payout policies in Malaysia towards future firm performance is confirmed in the current study, with more pronounced results obtained for share repurchase as compared to dividend. The information signaling hypothesis for share repurchases is proven, especially among share repurchasing firms that frequently buy back shares and those with small market capitalization. Meanwhile, the information content hypothesis for dividends is only demonstrated among dividend paying firms with large market capitalization and those that regularly pay dividends. Last but not least, the information content hypothesis is also verified among mutual payers that involved in both dividend payout and share repurchase.

5.2 Research Implications

As stated under the problem statement, Malaysia's Minority Shareholders Watch Group claimed that the action of share buyback which is intended to stabilize a company's share price regardless of its intrinsic value may be considered creating a false market that is illegal under the securities laws (Toh, 2019). Through share buybacks, the earnings per share of the company improve when the number of outstanding shares is reduced. The price-to-earnings ratio would fall if earnings per share increased, implying that the company is undervalued. As a result, stock prices could rise as investors are made to believe that the company is financially sound. However, the decision to buy back shares is not based on the overall growth in profits of the company. So, only an accounting effect is produced as it can still boost the earnings per share even if the net income is not improving. With respect to the views of Malaysia's Minority Shareholders Watch Group mentioned earlier, the findings

from the current study shall resolve such issue as it shows real improvement of future firm performance in the post-buyback period. Therefore, the significant impact of share buybacks on future firm performance among Malaysian firms shall provide insight to government particularly when contemplating legislation to revisit buyback rules.

From the practical perspective, the current study shows that share repurchases contain useful information for market participants. The positive impact found between share repurchases and future firm performance verifies the information signaling role of share buybacks in Malaysia. Such significant findings shall enhance investor sentiment as the action by management indicates actual improvement in the firm's intrinsic value as portray through the action of share buyback. Secondly, dividends or share buybacks are not only a means of regular income but also an important input in the valuation of a firm, especially those investors who depend on corporate payout information as a basis of investment decisions. Since the results from the current study generally indicate that the payment of dividends does not signal expectations of future earnings, long term local investors might need to switch to other signaling devices to obtain clues for management perception on firm prospect.

Moreover, the results from the current study also reflect the practice of corporate payout policy among public listed companies in Malaysia. The current study shows that local managers in Malaysia generally do not place great attention in applying dividend as a signaling device of future earnings. On the other hand, expectation of future earnings has always been taken into account when deciding on the action of share buyback. Therefore, such findings could assist firms' managers in setting corporate payout policy that could control their financial performance. This is because the flexibility of managers to invest in

projects is also affected by the amount of payout to shareholders, as a larger proportion of payout may result in fewer funds available for investing which may affect the financial performance of firms.

From the theoretical perspective, the findings from the current study could contribute to the literature by confirming the previous research. The significant improvement of future firm performance in the post-buyback period documented in the current study validates the information signaling role of share repurchase in Malaysia. Hence, robust evidence is added to the information signaling hypothesis in the context of emerging market. Meanwhile, the results for dividend from the current study which are generally not in support of the information content hypothesis implies that more studies are clearly needed for further verification.

5.3 Limitations of the Study

The limitation of the study is related to low R-squared values in the model. It indicates that the study may have not uncovered other relevant factors that directly or indirectly affect the firm performance. According to prior studies, the payout policy itself is claimed to be affected by other factors. Share repurchase is conducted to distribute excess cash flow (Baker, Powell & Veit, 2003; Benhamouda & Watson, 2010; Jensen, 1986; Lee & Suh, 2011), to achieve optimal leverage (Guffey & Schneider, 2004; Ofer & Thakor, 1987), to neutralize effects of stock option (Fenn & Liang, 2001; Jagannathan & Stephens, 2003) and to prevent hostile takeovers (Bagwell, 1991; Lee, Ejara & Gleason, 2010). Meanwhile, dividend policy is affected by the motive of mitigating agency costs (Arko et al., 2014; Easterbrook, 1984; Jensen & Meckling, 1976; Patra, Poshakwale & Ow-Yong, 2012), catering investor demand (Baker & Powell, 2012; Baker & Wurgler, 2004) and

following the life cycle of firm (Baker et al., 2007; Baker & Kapoor, 2015; Fama & French, 2001; Lease et al., 2000). Therefore, the causalities between corporate payout policy and potential influential factors mentioned earlier may lead to endogeneity problems.

In the context of the current study, dividend payout ratio and buyback ratio are used as alternative proxies to replace the independent variables of dividend ratio and share repurchase ratio. Even though the utilization of alternative proxies for independent variables do not yield any difference in results in this study, but there are other ways to measure the dividend policy and share repurchase.

5.4 Recommendations for Future Study

In consideration of the limitation for the current study, it is suggested that future study may conduct two stage least square regression tests to manage the endogeneity issue. Using a simultaneous equation method, a more sophisticated earnings expectation model extended from the one addressed by Nissim and Ziv (2001) and Grullon et al. (2005) may be employed.

Moreover, it is recommended to add additional proxies for independent variables in the future study to ensure the validity of the results through robustness checking. For instance, other proxies like dividend to net sales (Ting, Kweh, Ahmad & Paramanantham, 2021), changes of dividend payout to changes of total assets (Kasaharaa & Oriharab, 2022), dividend increase and dividend yield (Akindayomi & Amin, 2022) or choice of share buyback and percentage of shares outstanding sought for repurchase (Jena, Mishra & Rajib, 2020) may be included.

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Appendix A: Sample of Panel Data Analysis for Dividend with STATA

Stata/MP 13.0 - [Results]

File Edit Data Graphics Statistics User Window Help

xtreg futureroe div ta cash lever mtb cur, fe robust

Fixed-effects (within) regression Number of obs = 7100
 Group variable: code Number of groups = 355

R-sq: within = 0.0051 Obs per group: min = 20
 between = 0.0919 avg = 20.0
 overall = 0.0112 max = 20

F(6,354) = 3.47
 Prob > F = 0.0024

(Std. Err. adjusted for 355 clusters in code)

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
div	.1933612	.2372111	0.82	0.416	-.2731591	.6598815
ta	-.002537	.0029003	-0.87	0.382	-.008241	.0031669
cash	.2541731	.0779156	3.26	0.001	.1009374	.4074089
lever	-.0032851	.0017677	-1.86	0.064	-.0067616	.0001914
mtb	.0004324	.000418	1.03	0.302	-.0003896	.0012544
cur	-.0020422	.0012046	-1.70	0.091	-.0044112	.0003268
_cons	.0663123	.0520352	1.27	0.203	-.0360247	.1686493
sigma_u	.19203917					
sigma_e	.62948605					
rho	.08514509	(fraction of variance due to u_i)				

Command

C:\Users\Apple\Documents CAP NUM OVR

Appendix B: Sample of Panel Data Analysis for Share Repurchase with STATA

The screenshot shows the Stata/MP 13.0 - [Results] window. The command entered is `. xtreg futureoper repr ta cash lever mtb cur, fe robust`. The output displays fixed-effects regression results with 3060 observations and 153 groups. The R-squared values are: within = 0.0161, between = 0.0064, and overall = 0.0136. The F-statistic is 7.80 with a probability > F of 0.0000. The standard error adjusted for 153 clusters in code is shown.

futureoper	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
repr	1.00344	.2393652	4.19	0.000	.5305279	1.476353
ta	-.0093788	.0095464	-0.98	0.327	-.0282395	.009482
cash	.0811809	.0396506	2.05	0.042	.0028434	.1595184
lever	.0003129	.0002587	1.21	0.228	-.0001982	.0008241
mtb	-.0000152	.0000301	-0.50	0.615	-.0000746	.0000443
cur	-.0017168	.000341	-5.03	0.000	-.0023906	-.0010431
_cons	.2279881	.1872812	1.22	0.225	-.1420222	.5979983
sigma_u	.06614526					
sigma_e	.20741454					
rho	.09231152	(fraction of variance due to u_i)				

The Command window at the bottom is empty.